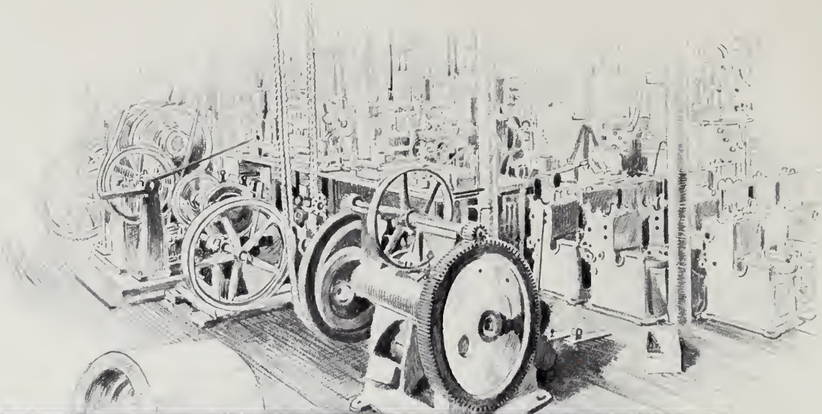
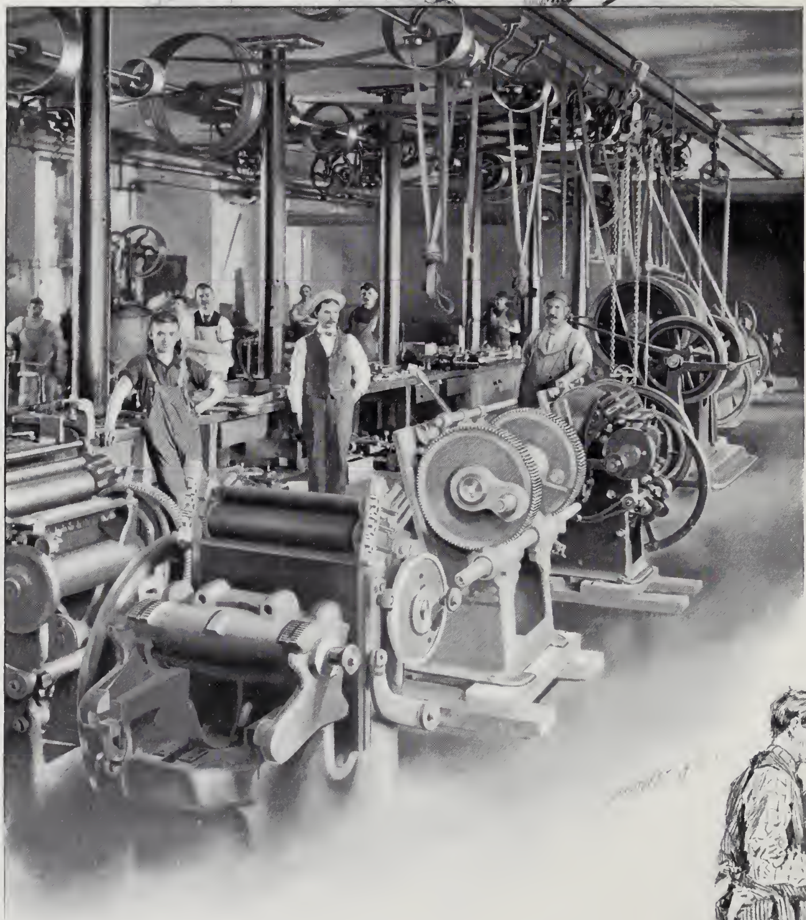
JOHN THOMSON PRESS COMPANY

NEW YORK, U.S.A.

DESIGNERS AND MANUFACTURERS OF PLATEN PRESSES FOR PRINTING EMBOSSING CUTTING & SCORING


ILLUSTRATED CATALOGUE AND PRICE LIST OF JOHN THOMSON PRESS COMPANY'S PLATEN PRESSES

FOR LETTERPRESS AND COLOR PRINTING, EMBOSSING, BOOK-COVER STAMPING AND PAPER-BOX CUTTING AND SCORING

DESIGNED & PATENTED BY JOHN THOMSON, C.E. BUILT AT COLT'S ARMORY BY COLT'S PATENT FIRE-ARMS MANUFACTURING COMPANY, HARTFORD, CONN.

TRADE NAME: "THE COLT'S ARMORY PRESS" TRADE MARK: THE FIGURE OF A COLT RAMPANT CAST ON THE PRESSES

ADDRESS ALL COMMUNICATIONS TO

JOHN THOMSON PRESS COMPANY

253 BROADWAY POSTAL TELEGRAPH BUILDING

NEW YORK CITY

CABLE ADDRESS HEATHER NEW YORK

TELEPHONE 3080 CORTLANDT

Bartlett
& Company
The Orr Press
New
York

THIS CATALOGUE may be taken as a fair representation of the character and inclusiveness of the machines herein described. In our judgment, the most certain method for rejuvenating the business of printing, is for printers to bring out work which shall be more satisfying to the public than the old. Thus, the printer, not the public, may set the pace and the *price*. If such can be accomplished with little or no increase in the cost of production, then the result means profit to the printer. And it is precisely this which, when the conditions are right, we pretend to bring about.

Our presses are especially adapted for such printers as have the skill and the desire to produce first-class printing. For such hands, we undertake to furnish the means whereby the very best presswork can be obtained for the least expenditure in paper, ink, pressmen, feeders and maintenance; in other words, the most and the highest in product for the least expenditure and in the shortest time.

With those who are satisfied with the smudge of a stencil a *printed* sheet would be lost. With that kind of "printers" we have neither desire nor intention of opening communication. They are the mongrels who put a cloud upon the art and have made it possible for a certain grade of presses to be sold that were as well built in the iron foundry as in the machine shop.

As a matter of business principle our entire aim has been, and is, to increase the scope, capacity, speed and durability of our machines; to keep the quality up and charge for it; to put into the hands of the skillful the highest grade of instrument.

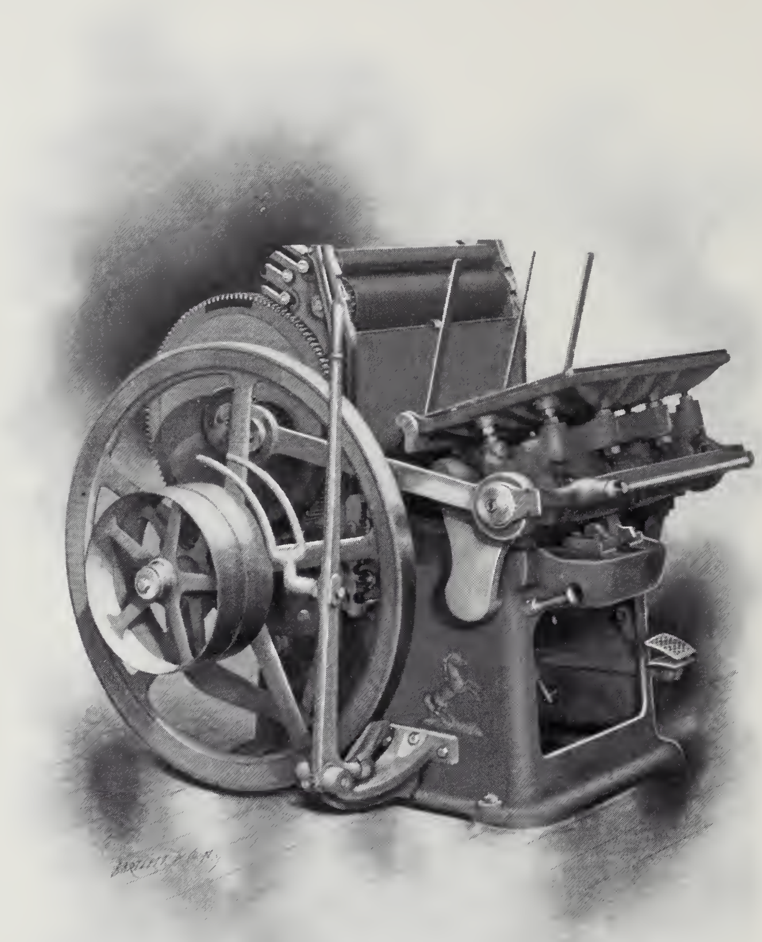
In fine, the presses of our line are the best we know how to make, and we have the temerity to assert that they are the best in the field; hence we choose to deal not only with those who can afford to select the best, but who have the skill and the desire to properly use such when furnished; for this is the combination of right conditions which means success to you and satisfaction to us.

JOHN THOMSON PRESS COMPANY,

BY JOHN THOMSON, PRESIDENT.

HENRY S. KEARNY, TREASURER.
WILLIAM THOMSON SECRETARY.

SEPTEMBER, 1896.

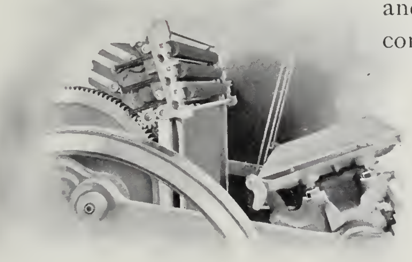


HALF SUPER-ROYAL STYLE TWO

The color work of cover, also the specimens shown herein, were executed upon presses of this size and type owned and used by the printers of this catalogue.

THE frame is designed to obtain the highest degree of rigidity and strength. The entire structure, bed, sides and cross girths, is cast together, forming one part. There are no curlycues, scrolls or filigrees; but every line has been laid and stands for one purpose—efficiency.

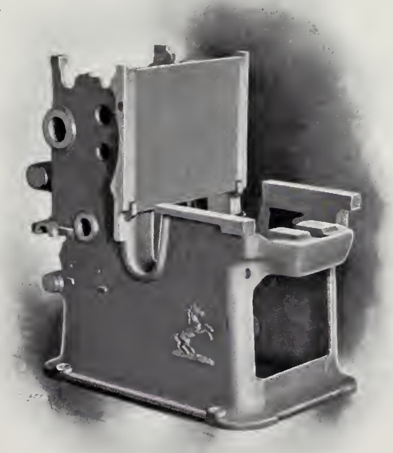
The platen is attached to the bridge by four impression-adjusting bolts, while the four corners and the center are supported by jack-bolts provided with jam-nuts. This refers to the Styles One and Two; in all other styles the construction is solid, iron to iron, no strain being sustained on screw-threads.



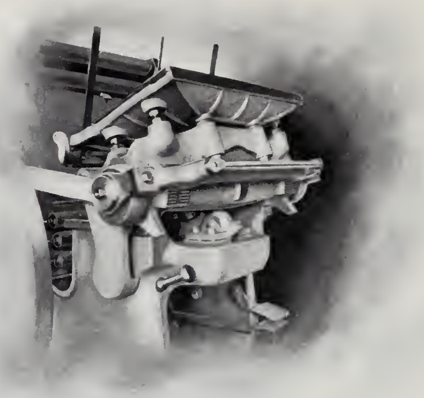
The tympan clamps are of unusually heavy section, steel, very strong and stiff. The upper clamp is provided with a projection below its pivot bearing, so that it cannot be swung over, by neglect or accident, between the bed and the platen. In earlier practice the failure to provide this protection had been the cause of numerous break-downs. The lower clamp may be drawn up clear of the frisket fingers, that the tympan may be conveniently inserted. With these clamps it is practicable to draw a tympan as tight as a drum-head, and to keep it so.

When the platen is about two-thirds open, the frisket fingers may be depressed upon the tympan, thereby affording convenient adjustment to the feed-gauges and the sheet.

The platen rolls out about 68° from the vertical, that is, some 15° or 20° greater angle than is usually found in platen presses. Its action during the feeding instant is an entirely original system, being constantly in motion; but during the time corresponding to the old stop or "dwell" the rate of movement is much less than that of the cranks. It has been well termed "a slow-moving dwell." The device for positively controlling the platen



consists of the simple cam, attached to and swinging with the bridge. It is engaged by a hardened steel friction roller, mounted in brackets secured to the frame.



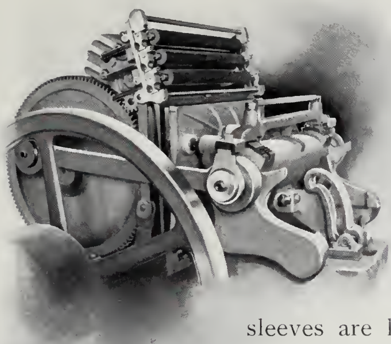
The ears of the bridge are provided with lugs, which lock upon the rocker-seats, whose function is to guide and control the platen during the slide to the impression. These ears are extended outward as far as is admissible to obtain the most effective leverage, for the purpose of resisting any strain in the platen tending to deflect it from a parallel line during the time of its impact upon the form. We regard this as an exceedingly important feature, as it obviates the tendency to cramp, greatly decreases the pressure upon the slides, and becomes much more effective in its control of the platen than when these ears are snubbed off short, as in competitive practice.

The platen is caused to make a theoretically perfect direct slide to and from the impression, every portion of its surface moving parallel to the form through a space of nearly three-fourths of an inch, making an absolutely square impact upon the types, irrespective of the height of the form, the intensity of the impression, or the thickness of the tympan.

The changing, or merging, of the vibrating movement into the direct slide, or *vice versa*, is accomplished without the slightest shock, jar, or tremor. There is no element of chance or uncertainty in this device; for, while the platen is perfectly free to perform its proper function, it is otherwise *as if locked* to its seat.

The walls of the cam are cut away, top and bottom, at the right hand of the tangent of the curve, corresponding to the direct slide to the impression, that the cam and its roller shall not be subjected to excessive strain. In fact, during the impression contact of the platen, the cam roller stands in *free space*. Hence, the duty required of the cam is relatively slight. The thrust upon the roller is constant, changing only with the motion of the platen. It is not, therefore, liable to wear flat. Moreover, this leaves the platen perfectly free to slide to the impression without the slightest restraint. Take two types betwixt finger and thumb, slide them back and forth, and this will exactly represent the impression action here described, both in its theory and practice.

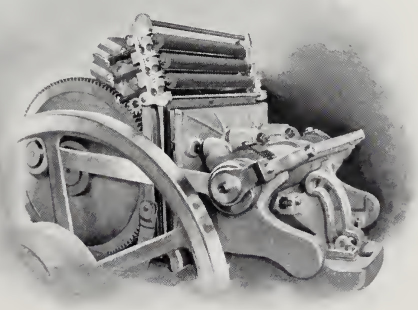
The impression may be thrown off, tripped, at any part of the platen motion, by disconnecting the latch and swinging the adjuster bar downward, which acts upon the eccentric sleeves attached thereto. The effect of thus swinging the eccentric sleeves is to lengthen the connecting rods. The adjuster bar is made of steel; the sleeves of tough, hard bronze. The shanks of the sleeves are let into recesses milled out of the face of the adjuster bar; hence but little strain is imposed upon the bolts, these simply acting to hold the parts together.

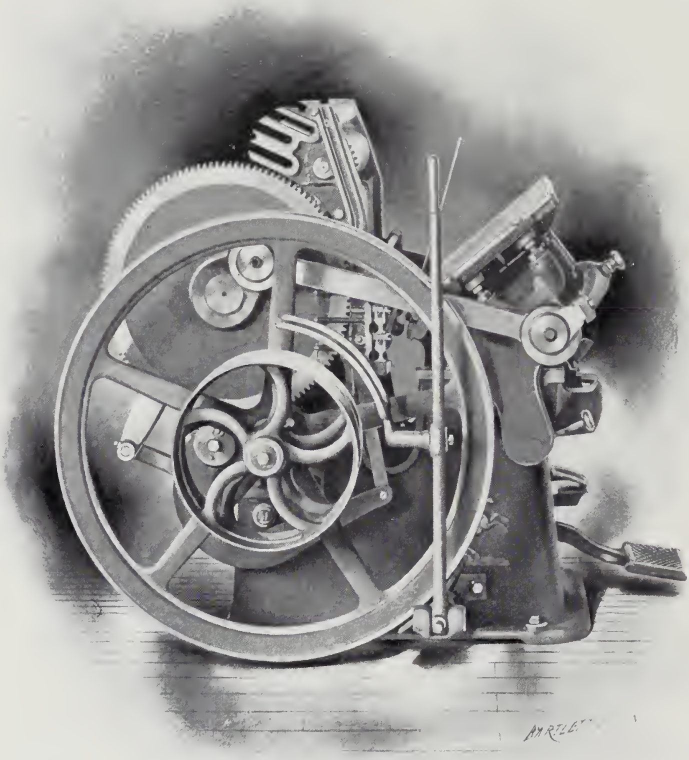


The adjuster slide is the part to which the adjuster bar and the eccentric sleeves are locked. It is adapted to positively engage a series of teeth milled in the central segment of the bridge. The slide is steel, drop-forged, accurately milled to gauge, and case-hardened.

This system of positively locking the adjuster slides is much preferable to any arrangement of friction-wedges; as when held by friction they can be hammered up by the feeder when throwing-in the adjuster bar, thus gradually increasing the impression and often resulting in twisting off the sleeves.

The adjustment of the impression, on Styles One and Two, is normally effected without touching the impression bolts, and often without changing the tympan, by simply setting the adjuster slides to different positions on the segments, the effect of which is to cause the platen to slide less or more upon its seats to or from the types. In other words, this has the effect of shortening the connecting rods when the slides are set up on the arc, and to lengthen the rods when the slides are lowered. We are particular



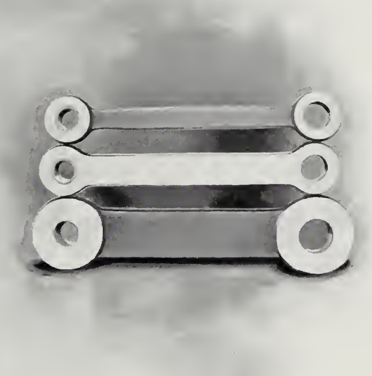


HALF MEDIUM STYLE ONE

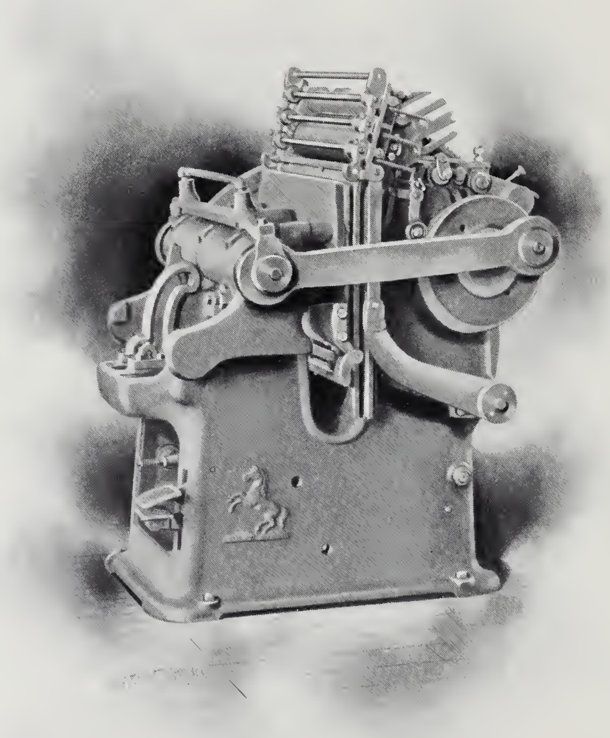
to set the platens of all presses as accurately as is possible by means of hardened steel gauges, so that as a rule the platen will not require adjustment when received by the printer. Our adjustment is adapted for a hard tympan, the use of which we strongly advise. In fact, there is no room here for pads or cushions.

The main connecting rods are formed without a weld, by drop-forging them in dies from a single billet of steel. The crank-pin "eyes" are bushed with hard bronze composition. Over 3500 of such rods have been made by us without a known failure.

The chase hook is elevated by the treadle at the right-hand side of frame. Its "lift" is limited by a stop pin, so that it cannot come in contact with the cylinder. The chase is locked by a powerful spring acting between the bed and the lever of chase hook. The spring and treadle may be adjusted by nuts. The pivoted guard above the pedal is to prevent accidental depression. This is swung upward by the foot when desirable to operate the latch, but it automatically swings back upon withdrawing the foot. The chief advantage of this arrangement and construction is, that the chase is locked with equal security, whether it be empty and true or filled and sprung out of shape by overstraining the lockup. Nor is there in this device any possibility of its grip ever being loosened by wear of its parts or vibration of the press. In making ready, when necessary to underlay, the chase may be conveniently tilted forward or removed by the pressman, who, having both hands free, elevates or permits the depression of the latch entirely by the pedal. It is a thoroughly substantial, reliable and convenient appliance for performing a most important duty.



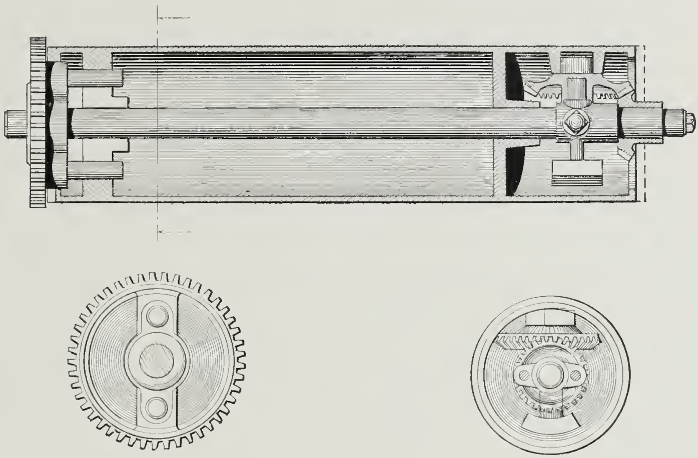
The distribution of ink is produced by causing the main cylinder both to rotate and to reciprocate or "vibrate." The device for effecting this result is a pair of bevel gear-wheels mounted within the cylinder. The smaller gear is fixed to the carriage-way and does not rotate. The larger gear is mounted upon an arm fixed to and moving with the cylinder shaft; hence, the larger gear has a compound movement, rotating with the cylinder and also upon its axis. This is termed the traveling gear. An eccentric stud upon this traveling gear carries a hardened steel slide-block engaging a slot in



HALF MEDIUM STYLE THREE

the cylinder. The consequence of this is that the cylinder as it rotates is also driven back and forth, the extent of this movement being equal to the "throw" of the eccentric stud.

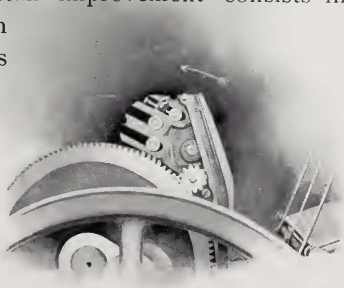
The velocity ratio of the gears is such as to produce a relatively slow "vibration" and at a speed differential to that of the rotation ;



DETAIL SECTIONAL VIEWS OF INK-DISTRIBUTING ACTION

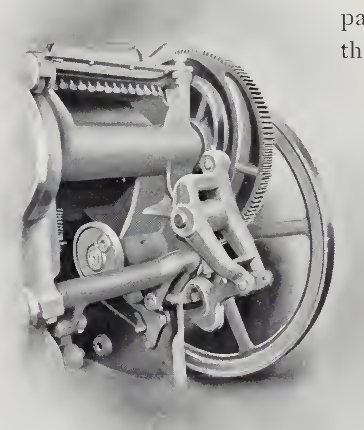
thus the rollers do not make contact, successively, upon the same portion of the cylinder. Moreover, the form rollers as well as the distributers are subjected to cross-line, or changer, distribution. It is exceedingly easy on rollers, without the slightest tendency to roughen their surface. No other platen press has this system ; which we assert is at least as effective and perfect as can be obtained in the most expensive stop-cylinders.

A recent and very important detail improvement consists in reversing the direction of revolution of the main ink cylinder, so that its thrust upon the form-inking rollers is upward instead of downward as heretofore. The consequence of this is that the form rollers are held up by the friction of the ink instead of being forced away as in previous and competitive practice. Moreover, this permits of a considerable reduction in the weight of the counter-balance of the carriage, permitting very high speed with assured durability.

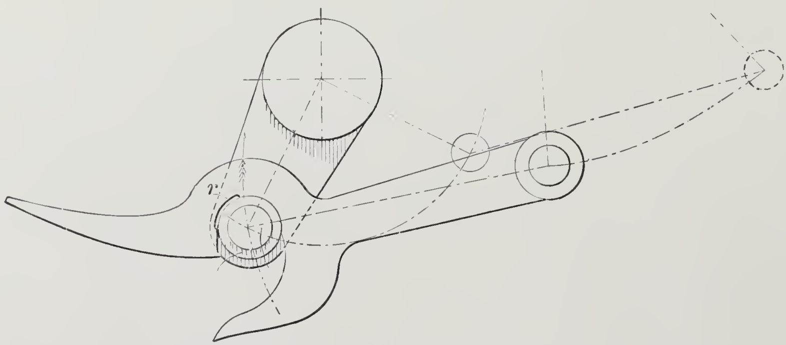


In small jobs of short runs the distributing rollers may be dispensed with; the cross-line or changer action of the cylinder upon the form rollers affording ample distribution. As a matter of fact this changer action of the cylinder makes it possible to obtain more effective results with one rolling of the form than could otherwise be obtained by two.

The carriage may be stopped upon the cylinder by drawing up and latching the projecting handle; which is shown on the left-hand side of the frame, front. This condition of operation is shown on page 7. The advantage of this is that the ink may be thoroughly distributed upon the form rollers while the form is in the bed. The device is positive and may be operated at will, either to engage or disengage. The durability of this apparatus has been greatly increased over earlier practice by the application of a steel friction roller to the hook pin, and recessing the quadrant, *r*, of the hook in such manner as to automatically lock, to avoid accidental disengagement. As a result of this arrangement the hook does not wear, the rubbing, or frictional, movement being entirely confined to the roller and its pin, both of which are hardened.

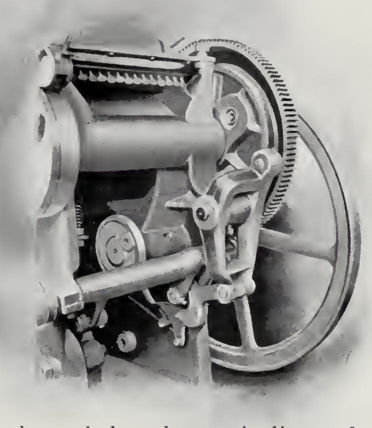


The bearings for the rods of the form roller boxes are of ample length, and the springs are locked to the slide-rods by split spring cotters. So, too, the carriage-way friction rollers are mounted upon hardened steel studs having channels extending through to the outside that oil may be readily applied.

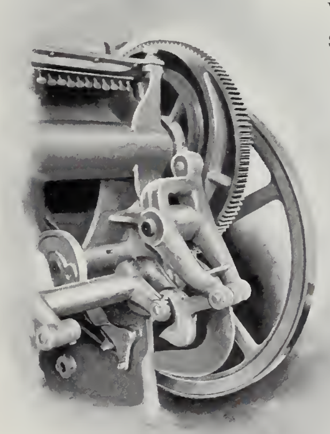


DETAIL VIEW AND DIAGRAM OF THE HOOK CONNECTION

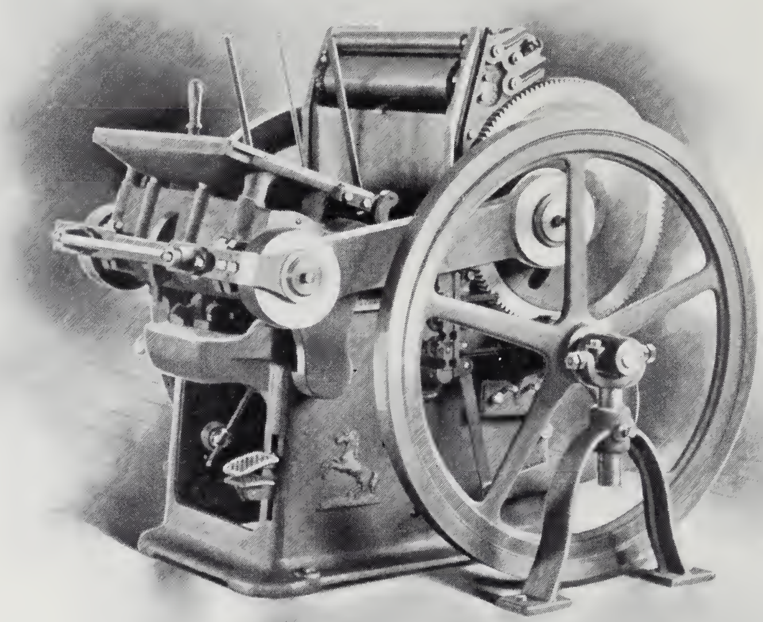
The movement of the form-inking carriage has been the subject of prolonged study and careful demonstration, whereby to effect such a design and disposal of the mechanism as to insure durability as well as perfect smoothness of action at any rate of speed possible to feed the press. Suffice it to say that this has been accomplished to a degree that leaves nothing to be desired. As has been well said by one of our frank expert competitors, "It's no use; we might as well admit it; we simply *can't tetch it!*" Among the improvements here referred to, mention may be made that the bracket which sustains the cam lever has been increased in stiffness; that the cam roller is of larger diameter; that the "throw" of the cam has been materially reduced; and that the strain lines of the action as a whole have been put into mechanical harmony. We are prepared to guarantee the durability of this action.



The slots in the carriage-ways are adapted to receive sliding journal boxes for the distributing rollers. The boxes are first slipped upon the journal bearings of the stock, and all, as one part, are then inserted in the slots. In this wise the slots in the carriage-ways cannot be cut and worn. We also furnish clamps, as see page 13, which apply conveniently to the *upper* slots of the carriage-ways of the Half Medium and Half Super-royal sizes; these being provided with adjusting screws for forcing the upper distributer stock into any desired degree of contact with the main cylinder and the upper small cylinder. These clamps, in connection with the reversal of the motion of the main ink cylinder, already referred to, completely overcome the annoying and often disastrous results which are experienced when these cylinders act like a *mill*, as in competitive practice, to melt the composition and tear it off the stock.

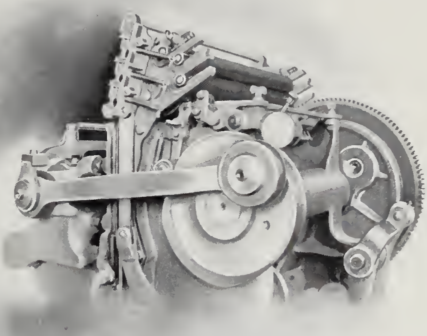


The operation of the ink fountain is as follows: The ductor roller is forced, by the contact of the friction roller mounted in the

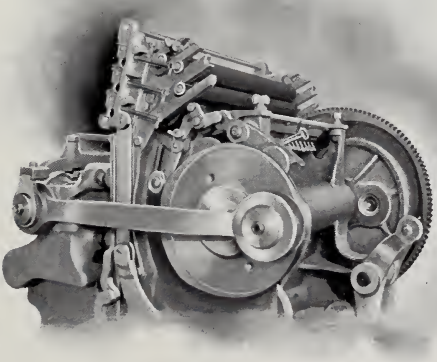


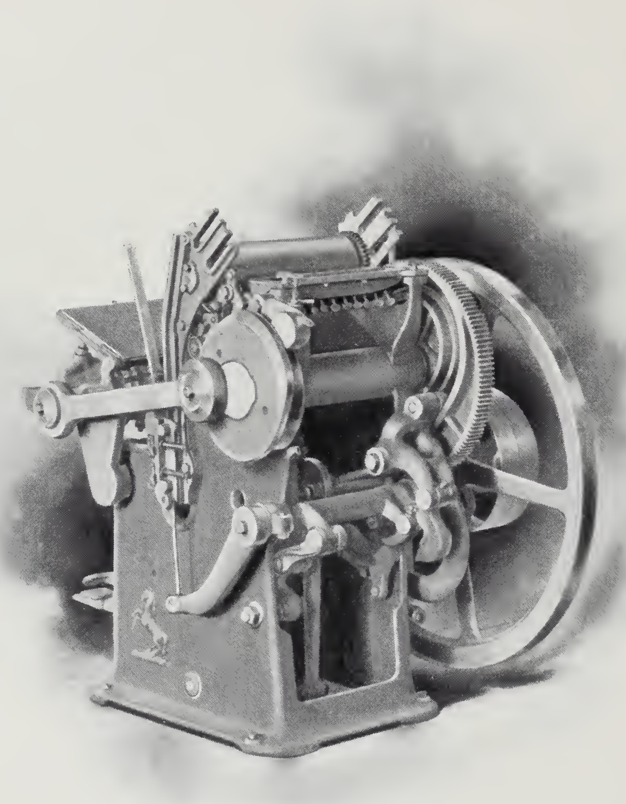
HALF SUPER-ROYAL STYLE FOUR

arm of the vibrator frame which acts upon the cam of the crank-wheel, against the fountain cylinder, and which is then rotated by the separate and distinct action of the bell-crank and its pawl, through a space equal to one or more teeth of the ratchet wheel. Thus the ink deposited upon the ductor roller will be as a strip whose width will be equal to the number of ratchet teeth acted upon by the pawl. Upon completion of the ratchet motion, the spiral spring, acting upon the arm of the vibrator frame, swings the ductor roller from the fountain cylinder over to the main ink cylinder. These movements are accurately timed, relatively, so that the contact of the ductor roller upon the main ink cylinder takes place as the carriage starts on its down motion. The feed may be instantly arrested or started, without stopping the press, by simply swinging the ratchet pawl in or out of engagement. So, too, the number of ratchet teeth to be engaged may be quickly changed by adjusting the thumb-screw in the driving lever to limit its throw. The important advantage of this arrangement over competitive devices is that the number of ratchet teeth engaged by the pawl is a means of controlling the feed; whereas in others one tooth is as effective as two, three or four. The fountain "well" may be removed from the press by simply detaching the two thumb-screws which normally bind it to the bed. The frame which carries the ductor roller may be swung relatively to the arm which actuates it so as to adjust for shrinkage of the ductor roller; so, too, in tints or half-tones this may be utilized to obtain a very light or heavy contact of the ductor roller upon the fountain cylinder.



Particular attention is directed to the combined belt-shifter and fly-wheel brake, as see pages 6 and 10. By means of this device a single thrust of the hand shifts the belt to the loose pulley and at the same time applies a leather-shod brake

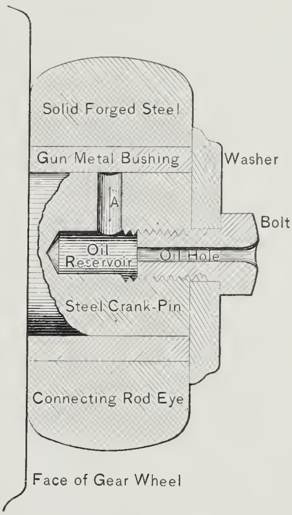




QUARTO MEDIUM

to the fly-wheel. The brake shoe is mounted upon the bell-crank extension of the hand lever by a ball and socket connection; hence the leather-shod shoe will automatically adjust itself to a proper contact on the face of the fly-wheel, whatever may be the wear of the parts. The fork may be swung on the lever to effect a proper throw of the belt when taken in connection with the stop-bolt which acts in the bell-crank against the supporting bracket. The disposal of these parts is such as to produce a wedging action between the shoe and the fly-wheel; hence with but a slight thrust from the hand the fly-wheel, even when driven at four revolutions a second, can be brought to a stop within the period of one revolution. Since this device was applied we have yet to hear of a smash as the result, say, of dropping a bunch of sheets into the press, as the instinctive act of the feeder is to "throw off the belt," and when he does this *he stops the press.*

Especial care has been taken to provide means for conducting oil to the bearings. These details should be carefully examined by pressmen before starting up, particularly as refers to the main ink cylinder, the carriage-ways, the connections, the pinion shaft and the connecting rods. In regard to the latter we have a special arrangement, applied both to the crank pins and the bridge trunnions, which has proved highly satisfactory in practice. It is shown in the annexed diagram. As will be seen, the "eyes" of the connecting rods are not pierced. During every revolution the oil runs back and forth through the channel *A;* thus flooding the bearings after each impression. Since this construction was adopted, about eight years ago, we have never heard of a cut or worn crank pin.



A somewhat similar provision for oiling the bearings will be found in the gearing of the main ink cylinder, illustrated on page 13; also for the roller and pin of the bridge-cam. But, as see page 46, the ultimate success of these provisions depends upon the following contingencies, namely: first, the quality of the oil, and, second, *that the oil be applied.*

STYLES AND ADAPTATIONS

Our printing presses are divided into four groups or grades, designated in the order of their cost and quality, namely: Styles One, Two, Three and Four.

STYLE ONE

This is our regular machine of lowest price, containing everything hereinbefore described. It is manufactured in the Eighth Medium, Quarto Medium, Half Medium and Half Super-royal sizes. See pages 10 and 18.

STYLE TWO

This press is manufactured in the Half Medium and Half Super-royal sizes and differs from the Style One in the following particulars: First, the main gear-wheel is made with a section of steel fused into the edge of the main iron body, this section containing the impression teeth; that is, the teeth which carry the cranks over the nip. This construction is denoted in the engraving, page 6, by the darkened section in the main gear-wheel. It is practically impossible to break these teeth. Second, the adjuster bars are of steel and are provided with two latches, located close to the adjuster sleeves, but connected by a single cross-bar so that both latches are operated by one hand. Third, the platen is cast solid without recesses or chambers. We strongly recommend it as the best value we can offer for printers who desire to produce the character of half-tone and color work now common to the more progressive job printing offices.

STYLE THREE

This machine is built in the Half Medium and Half Super-royal sizes and may be variously adapted for regular letterpress printing, the very heaviest cut or tint printing, wood printing for packing boxes or toy blocks, book-cover inlaying, light embossing and hot stamping.

It particularly differs from Styles One and Two as follows: The pinion shaft is extended outwardly and is provided with an outside floor support; the fly-wheel is heavier; the crank-wheel is solid; the larger gear-wheel has the steel impression teeth described; the crank-pins are hardened; the connecting rods are of heavier section; the bridge and platen are brought together solid, iron to iron, virtually forming one piece, no pressure being sustained by screws, and the adjuster bar is secured to the bridge by two latches.

The platen may be fitted with a removable platen blank, or plate, whereby to quickly adjust the machine either to "type high," as in letterpress, or to obtain extra space, as is often required in book-cover work, wood printing or embossing.

In some cases removable steam blanks, or "heads," may also be applied to the bed of the press, locked thereto by the chase hook; but it is usually preferable to insert the steam blank into the bed as a permanent fixture. The steam pipes are connected by unions, the pipes passing back under the bed.

We have had an extensive experience in adapting presses of this style to special uses, and if we are carefully informed as to the purpose for which the machine is desired we can often offer suggestions to the purchaser which are of material advantage in the practical fitting up and operation of the press.

Suitable feed gauges are supplied when the adaptation is for book-cover inlaying or wood printing. See page 12.

STYLE FOUR

This press is built in the Half Super-royal size only. It is double geared, with double fly-wheels, extra heavy connecting rods, sleeves, shafts and bed. Steam blanks are built into the bed as a permanent fixture. It is adaptable to light book-cover stamping, hot, and then to inlay without shifting the die or gauges. It has also been successfully used for embossing, hot or cold; for both inking and embossing at the same impression, as well as for anything that can be printed on a platen machine. We think the limit has been reached in this press as respects strength, rigidity and inclusiveness of adaptation. See page 16.

DOUBLE INKING DEVICE

The form roller carriage of the Half Medium and Half Super-royal sizes can be fitted with an attachment whereby one of the rollers is carried out free of the form on the down motion; but is automatically released at the bottom, snaps back into contact with the form and supplies its charge of ink as it travels upward. In this wise the form is inked both from the top and the bottom, like a "double-ender."

SIZES PRICES AND DETAILS
"COLT'S ARMORY" PLATEN PRINTING PRESSES

EIGHTH MEDIUM, STYLE ONE.—Size, 8 x 12 inches inside of chase.

Two form rollers, 1¾ inches in diameter. Price of press, plain	$215 00
Price of steam fixtures	15 00
Price of ink fountain	20 00
Price, complete	$250 00

The following parts are included: 4 form roller stocks; 2 distributer stocks; 2 vibrator stocks; 2 carriage-way boxes; 8 form roller wheels—4 large, 4 small; 1 roller mold; 3 chases; 2 feed tables, with outside floor standards; 3 frisket fingers; 3 wrenches; and 1 treadle. Approximate net weight, 910 pounds; gross weight, boxed for shipment, 1150 pounds. Dimensions of pulleys, 2 inches face by 9⅞ inches diameter. Revolutions to each impression, 5. Will operate safely and smoothly up to 2600 impressions an hour. Can usually be supplied immediately upon receipt of order. If desired, 2 extra chases will be given in lieu of mold; also 2 in lieu of treadle. *Terms on application.*

QUARTO MEDIUM, STYLE ONE.—Size, 10 x 15 inches inside of chase.

Two form rollers, 2 inches in diameter. Price of press, plain	$315 00
Price of steam fixtures	15 00
Price of ink fountain	20 00
Price, complete	$350 00

The following parts are included: 4 form roller stocks; 4 distributer stocks; 2 vibrator stocks; 4 carriage-way boxes; 8 form roller wheels—4 large, 4 small; 1 roller mold; 3 chases; 2 feed tables, with outside floor standards; 3 frisket fingers; 3 wrenches; and 1 treadle. Approximate net weight, 1500 pounds; gross weight, boxed for shipment, 1835 pounds. Dimensions of pulley, 2⅜ inches face by 12 inches diameter. Revolutions to each impression, 6. Will operate safely and smoothly up to 2600 impressions an hour. Can usually be supplied immediately upon receipt of order. If desired, 2 extra chases will be given in lieu of mold; also 2 in lieu of treadle. *Terms on application.*

HALF MEDIUM, STYLE ONE.—Size, 13 x 19 inches inside of chase.

Three form rollers, 2 inches in diameter. Price of press, plain	$410 00
Price of steam fixtures	15 00
Price of ink fountain	25 00
Price, complete	$450 00

The following parts are included: 6 form roller stocks; 4 distributer stocks; 2 vibrator stocks; 1 riding metal distributer cylinder; 4 carriage-way boxes; 2 adjusting clamps; 12 form roller wheels—6 large, 6 small; 1 roller mold; 3 chases; 2 feed tables, with outside floor standards; 3 frisket fingers; 3 wrenches; and 1 treadle. Approximate net weight, 2085 pounds; gross weight, boxed for shipment, 2470 pounds. Dimensions of pulleys, 3 inches face by 14 inches diameter. Revolutions to each impresssion, 8¼. Will operate safely and smoothly up to 1800 impressions an hour. Can usually be supplied immediately upon receipt of order. If desired, 2 extra chases will be given in lieu of mold; also 2 in lieu of treadle. *Terms on application.*

Half Super-royal, Style One.—Size, 14 x 22 inches inside of chase.

Three form rollers, 2 inches in diameter. Price of press, plain	$475 00
Price of steam fixtures	15 00
Price of ink fountain	25 00
Price, complete	$515 00

The following parts are included: 6 form roller stocks; 4 distributer stocks; 2 vibrator stocks; 1 riding metal distributer cylinder; 4 carriage-way boxes; 2 adjusting clamps; 12 form roller wheels—6 large, 6 small; 1 roller mold; 3 chases; 2 feed tables, with outside floor standards; 3 frisket fingers; 3 wrenches; and 1 treadle. Approximate net weight, 2270 pounds; gross weight, boxed for shipment, 2705 pounds. Dimensions of pulleys, 2¾ inches face by 14½ inches diameter. Revolutions to each impression, 8¼. Will operate smoothly and safely up to 1700 impressions an hour. Can usually be supplied immediately upon receipt of order. If desired, 2 extra chases will be given in lieu of mold; also 2 in lieu of treadle. *Terms on application.*

Half Medium, Style Two.—Size, 13 x 19 inches inside of chase.

Three form rollers, 2 inches in diameter. Price of press, plain	$460 00
Price of steam fixtures	15 00
Price of ink fountain	25 00
Price, complete	$500 00

The following parts are included: 6 form roller stocks; 4 distributer stocks; 1 riding metal distributer cylinder; 2 vibrator stocks; 4 carriage-way boxes; 2 adjusting clamps; 12 form roller wheels—6 large, 6 small; 1 roller mold; 3 chases; 2 feed tables, with outside floor standards; 3 frisket fingers; and 3 wrenches. Approximate net weight, 2125 pounds; gross weight, boxed for shipment, 2510 pounds. Dimensions of pulleys, 3 inches face by 14 inches diameter. Revolutions to each impression, 8¼. Will operate safely and smoothly up to 1800 impressions an hour. Can usually be supplied immediately upon receipt of order. If desired, 2 extra chases will be given in lieu of mold. *Terms on application.*

Half Super-royal, Style Two.—Size, 14 x 22 inches inside of chase.

Three form rollers, 2 inches in diameter. Price of press, plain	$535 00
Price of steam fixtures	15 00
Price of ink fountain	25 00
Price, complete	$575 00

The following parts are included: 6 form roller stocks; 4 distributer stocks; 1 riding metal distributer cylinder, 2 vibrator stocks; 4 carriage-way boxes; 2 adjusting clamps; 12 form roller wheels—6 large, 6 small; 1 roller mold; 3 chases; 2 feed tables, with outside floor standards; 3 frisket fingers; and 3 wrenches. Approximate net weight, 2320 pounds; gross net weight, boxed for shipment, 2755 pounds. Dimensions of pulleys, 3 inches face by 14 inches diameter. Revolutions to each impression, 8¼. Will operate smoothly and safely up to 1700 impressions an hour. Can usually be supplied immediately upon receipt of order. If desired, 2 extra chases will be given in lieu of mold. *Terms on application.*

Half Medium, Style Three.—Size, 13 x 19 inches inside of chase. Three form rollers, 2 inches in diameter. Price of press, complete, including any desired adaptation, except hot work . . $600 00
Price of steam blanks, or heads . . . . $75 00 to 150 00

The following parts are included: 6 form roller stocks; 4 distributer stocks; 1 riding metal distributer cylinder; 2 vibrator stocks; 4 carriage-way boxes; 2 adjusting clamps; 12 form roller wheels—6 large, 6 small; 1 roller mold; 3 chases; 2 feed tables, with outside floor standards; 3 frisket fingers; and 3 wrenches. Approximate net weight, 2330 pounds; gross weight, boxed for shipment, 2775 pounds. Dimensions of pulleys, 3 inches face by 14 inches diameter. Revolutions to each impression, 8¼. Will operate safely and smoothly up to 1600 impressions an hour. Can usually be supplied in about 10 days after receipt of order. *Terms and details on application.*

Half Super-royal, Style Three.—Size, 14 x 22 inches inside of chase. Three form rollers, 2 inches in diameter. Price of press, complete, including any desired adaptation, except hot work . $650 00
Price of steam blanks, or heads . . . . $75 00 to 150 00

The following parts are included: 6 form roller stocks; 4 distributer stocks; 1 riding metal distributer cylinder; 2 vibrator stocks; 4 carriage-way boxes; 2 adjusting clamps; 12 form roller wheels—6 large, 6 small; 1 roller mold; 3 chases; 2 feed tables, with outside floor standards; 3 frisket fingers; 3 wrenches; and 1 treadle. Approximate net weight, 2510 pounds; gross weight, boxed for shipment, 3000 pounds. Dimensions of pulleys, 3 inches face by 14 inches diameter. Revolutions to each impression, 8¼. Will operate smoothly and safely up to 1500 impressions an hour. Can usually be supplied in about 10 days after receipt of order. *Terms and details on application.*

Half Super-royal, Style Four.—Size, 14 x 22 inches inside of chase. Three form rollers, 2 inches in diameter. Price of press, complete, including any desired regular adaptation, with steam head fixed in bed $900 00

The following parts are included: 6 form roller stocks; 4 distributer stocks; 1 riding metal distributer cylinder; 2 vibrator stocks; 4 carriage-way boxes; 2 adjusting clamps; 12 form roller wheels—6 large, 6 small; 1 roller mold; 3 chases; 2 feed tables, with outside floor standards; 3 frisket fingers; 3 wrenches; and 1 treadle. Approximate net weight 3336 pounds; gross weight, boxed for shipment, 3845 pounds. Dimensions of pulleys, 3 inches face by 14 inches diameter. Revolutions to each impression, 8¼. Will operate smoothly and safely up to 1500 impressions an hour. Can usually be supplied in from two to three weeks after receipt of order. *Terms and details on application.*

For tabulated price lists, shipping information and dimensions, see pages 39, 40, 41.

RECAPITULATION OF PRINCIPAL FEATURES TO BE FOUND ONLY IN OUR "COLT'S ARMORY" PRESSES

The relief of the platen cam during the impression, permitting a free, unrestrained slide to the form.

The positive cam motion of platen.

The chase latch; arranged to be operated by a pedal and to hold the form where it belongs, against the face of the bed.

The journal boxes, for distributer stocks.

The combined rolling and reciprocating action of the ink cylinder, obtaining direct ink distribution upon the form rollers.

The oil reservoir for crank-pin bearings.

The long, direct slide to the impression, with the heavy elongated controlling ears.

The drop-forged steel connecting rods.

The operating mechanism of ink fountain, ensuring a positive flow of ink.

The hook connection, locked to hardened steel roller.

The heavy tympan clamps and arrangement thereof.

The construction of adjuster bar and sleeves, avoiding expensive break-downs.

The wide angle of platen.

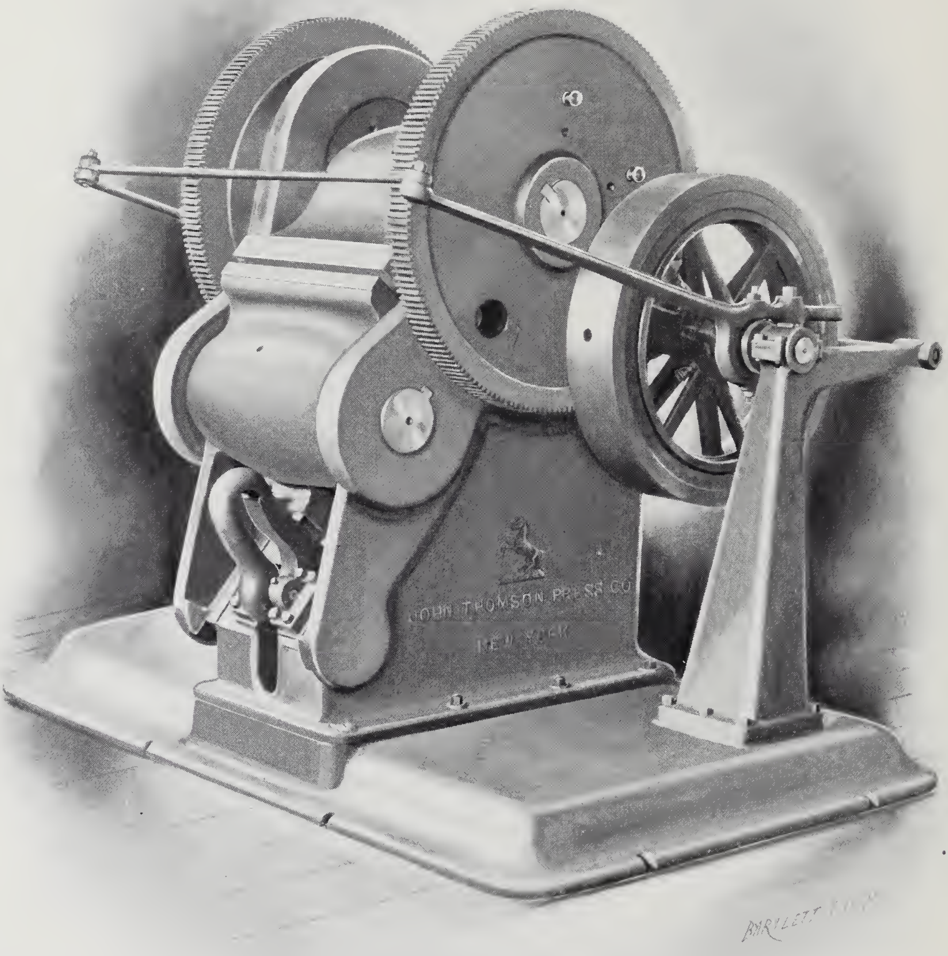
The new reverse movement of ink cylinder and reduced weight of counter-balance.

The long, slow-moving dwell for feeding.

The combined brake and belt shifter, a preventative of accidents.

The smoothest and most durable action, at the highest rates of operation.

For condensed price list, with weights, dimensions and special parts, see pages 39–41.



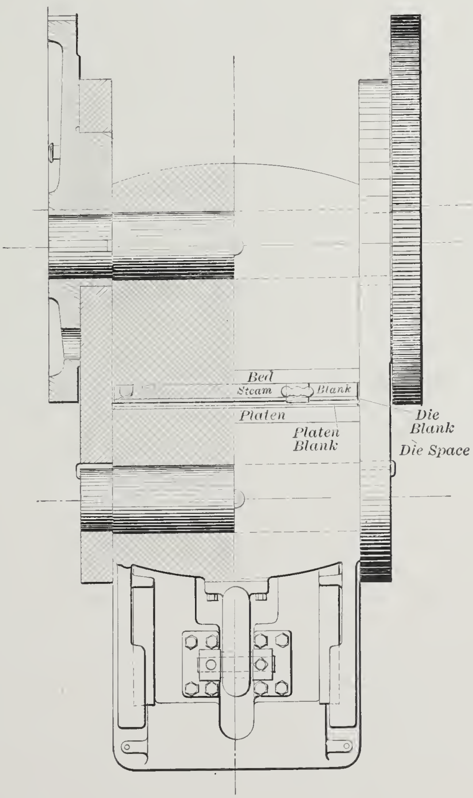
ECCENTRIC-ACTION EMBOSSING PRESS

SIZE 18 X 24 INCHES

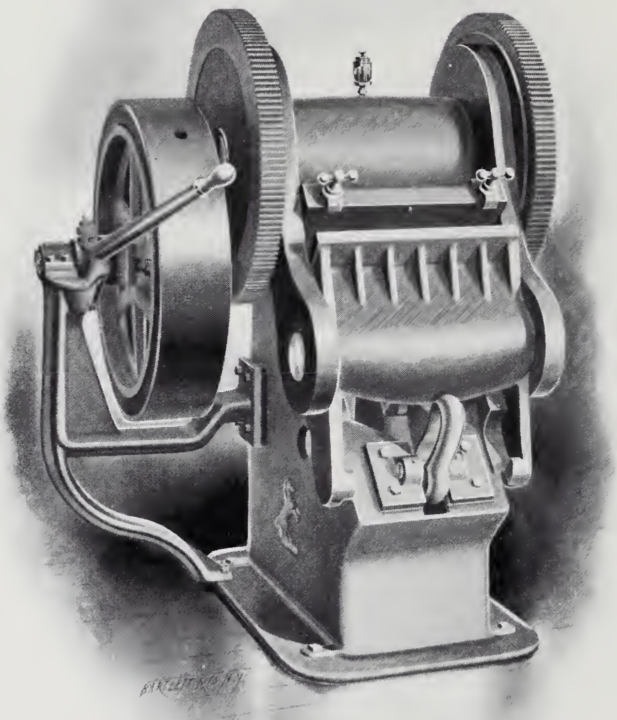
EMBOSSING PRESSES

The only press which we unreservedly recommend for embossing is our Eccentric-action Embosser, built in two sizes, 12½ x 18½ inches and 18 x 24 inches face of platen.

The peculiarity which establishes the designation of this press is that the platen is actuated by eccentrics instead of cranks, these eccentrics being formed on the inside faces of the gears, projecting through the main connecting rods, which latter are thus interposed between the finished side of the bed and finished faces of the gear-wheels, the space being just sufficient to permit free movement. The gears, being outside of the rods, can thus be made of almost any desired diameter, permitting a high relation of single-pair gearing. They are provided with steel teeth for carrying the impression, as indicated by the darkened portion of the engraving. The sides of the bed are carried out flush with the rods; hence the shafts and main connecting rods are brought to a shearing strain, the impressional stress being applied with almost theoretically perfect directness, avoiding the possibility of spring, end thrust or side cramp.



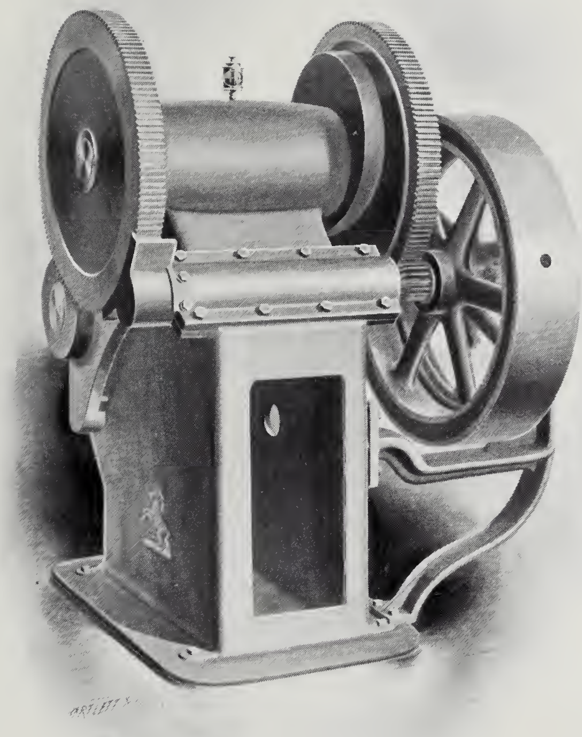
We believe that this press represents the nearest approximation to what has been well termed the "anvil principle" in machine construction that has ever been reached. The practical benefit to the em-



ECCENTRIC-ACTION EMBOSSING PRESS FRONT VIEW

SIZE 12½ X 18½ INCHES

The embossing of cover was executed upon a press of this type owned and used by the printers of this catalogue. Moreover, practically *all* of the remarkable examples of embossed pamphlet covers, issued during the past few years, have been executed upon this press. . . . .



ECCENTRIC-ACTION EMBOSSING PRESS REAR VIEW

SIZE 12½ X 18½ INCHES

bosser is the facility with which the "force" may be built up, and its long life when so completed, as there is no false cramping nor any tendency causing it to "crawl" and thus break down its lines.

The platen motion is, in general, similar to that of our printing presses—that is, an absolutely direct slide to the impression, positively controlled by interlocking lugs. The extent of the direct motion is about ¾ of an inch. But there is one important modification. The rocker seats being at an angle of 45° in the smaller press and 50° in the larger, the platen is thus virtually suspended by the connecting rods, the rockers sustaining but a portion of the weight of the platen. These conditions permit forming the bridge cam in such manner as to swing the platen on its shaft in unison with the travel of the eccentrics, so that the "throw" of the eccentrics is augmented to the extent that the lower edge of the platen is carried outward in a line practically parallel with the face of the bed. Two important advantages are thereby obtained: First, the entire face of the platen is, as it were, lifted out and up to the feeder; and, second, the radius (distance from center of gears) of the eccentrics is reduced to a minimum. Upon the inward motion of the platen the differential effect of the cam is reversed.

The bridge in this press is also the platen—that is, instead of being made in two parts bolted together, one massive, solid casting comprises the two functions. In the 12½ x 18½-inch press this part is of *solid steel*, the trunnions being 4½ inches in diameter. In the 18 x 24-inch press, the bridge is of cast-iron, bored to receive a 6½-inch forged steel shaft.

These presses are provided with a special friction clutch of our own design having great adhesive capacity. The shifter handle is fitted with a brake shoe so that when the clutch is thrown off, relieving the press from the fly-wheel and the belt, friction is at the same

instant applied to the web of the clutch mechanism, thereby stopping the platen at any desired position of its travel. The clutch may be operated with any degree of rapidity without danger of damaging the press, and without the slightest shock or jar in starting or stopping. We warrant it, without proviso whatsoever, to operate with complete satisfaction.

The pinions are cut solid in the driving shaft, which is mounted in a solid box, babbitted and then bored out, which extends across the entire width of the frame. The main connecting rods are of the most liberal dimensions, and are made of forged steel, finished over their entire surface. There is a section of machinery steel in each of the gear-wheels, in which are formed the teeth that carry the eccentrics over the nip. These sections are formed separately and are then fused to the iron, the adherence of the two metals being as perfect as the weld in a gold ring.

Owing to the inclination of the beds, the platens are caused to swing both outward and *upward* to about the horizontal. In this manner the face of the platen presents itself to the pressman or feeder like a table.

The press is entirely self-contained, every part being directly attached to the frame or bed-plate. The eccentrics are oiled from the outside of the gear-wheels through drilled plugs, and the bridge shaft through a slot or opening in the bridge, consequently the connecting rods are not pierced. Oil reservoirs are formed in the gears by the aforesaid plugs, from which oil holes lead to the bearing faces of the eccentrics; hence, the oil is fed automatically at each revolution of the gears.

If frequently and carefully oiled, there is no limit to the speed except the ability of the operator to lay the sheets. We know that several of the smaller presses are worked in regular practice up to 1800 impressions an hour.

A steam blank or "head" may be fitted to the bed, the pipes therefrom passing out backward under the pinion-shaft bearing. All necessary gauges, adjustments, etc., are furnished.

These machines are stiffer, stronger, more enduring, safer for the feeder, *and have from three to four times the output of the old-fashioned toggle-joint presses.*

PRICE LIST ECCENTRIC-ACTION EMBOSSING PRESSES

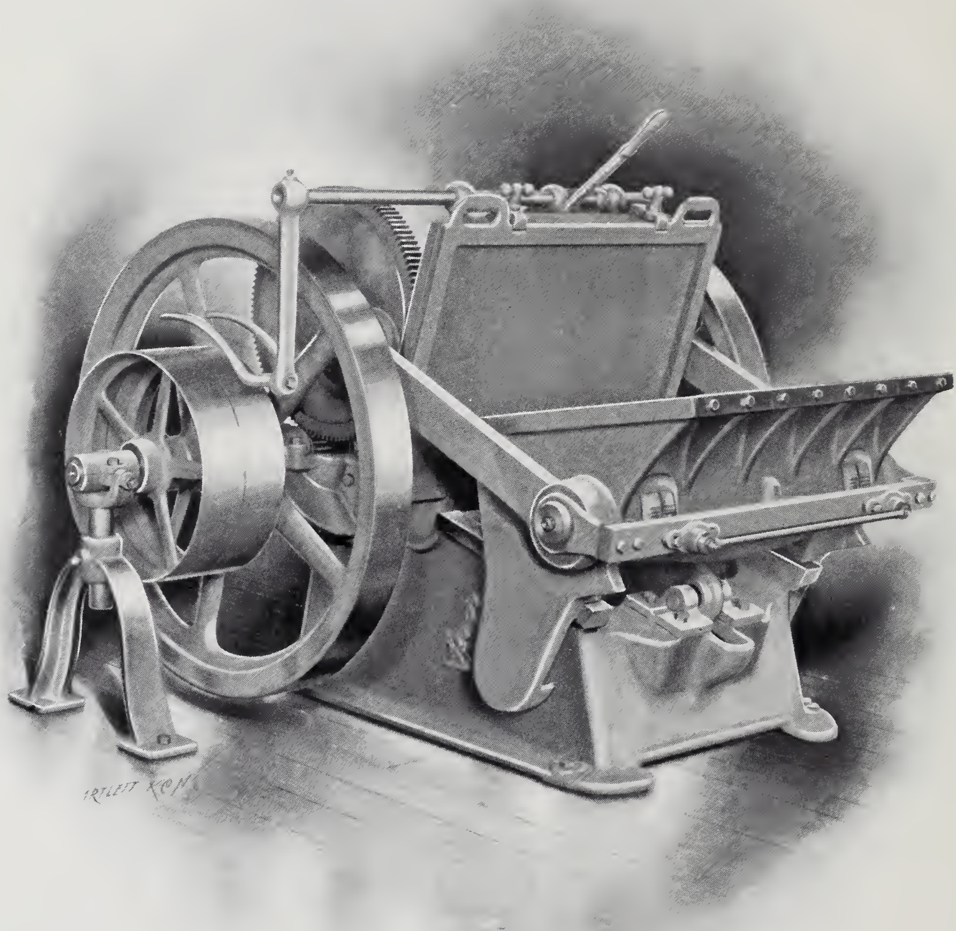
Price of the 12½ x 18½-inch size, *without* steam head, including any desired adapation of platen, gauges and blanks	$1100 00
Same press *with* steam head	1200 00

Clear space between connecting rods is 18½ inches. Net weight, 3600 pounds. May be operated with safety and durability at any speed possible to feed the sheets. Delivery can usually be made in from two to three weeks.

Price of 18 x 24-inch size, with steam head, including any desired adaptation or adjustment	$2750 00

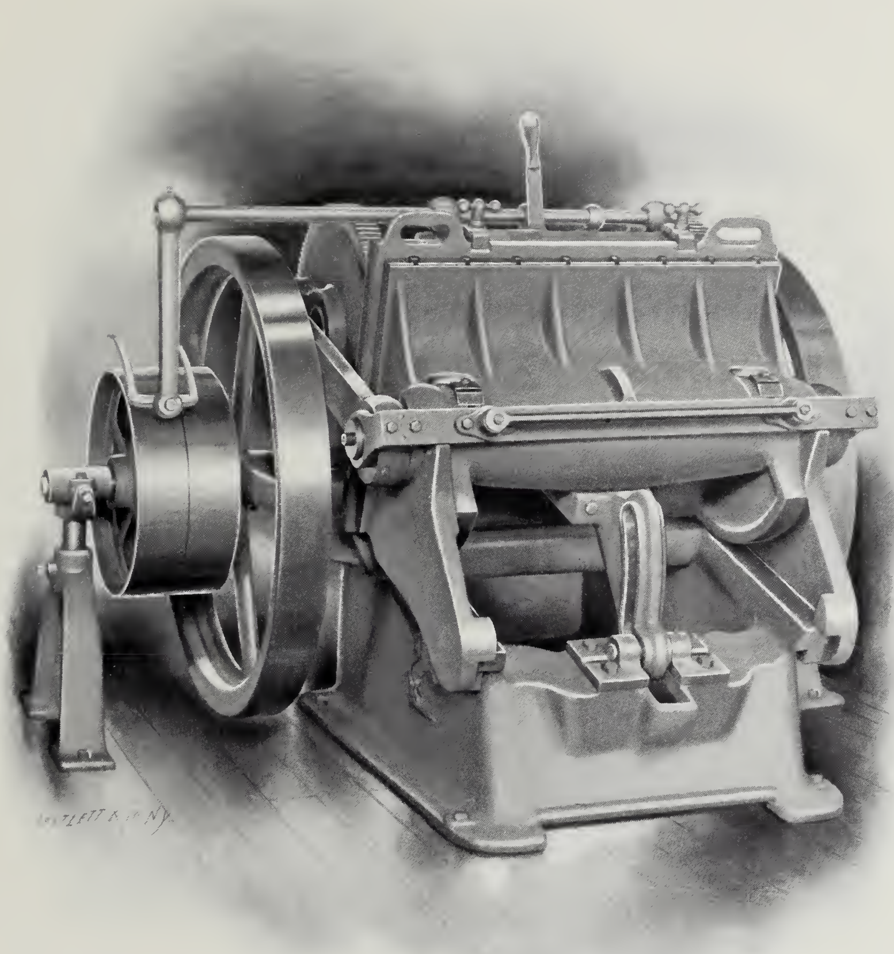
Clear space between connecting rods, 24½ inches. Net weight, about 13,000 pounds. Built to order only.

For dimensions and speeds of pulleys, floor space, etc., see table, page 40.



CRANK-ACTION CUTTING AND SCORING PRESS PLATEN OPEN

SIZE 20 X 30 INCHES



CRANK-ACTION CUTTING AND SCORING PRESS PLATEN CLOSED

SIZE 20 X 30 INCHES

PAPER-BOX CUTTING AND CREASING PRESSES

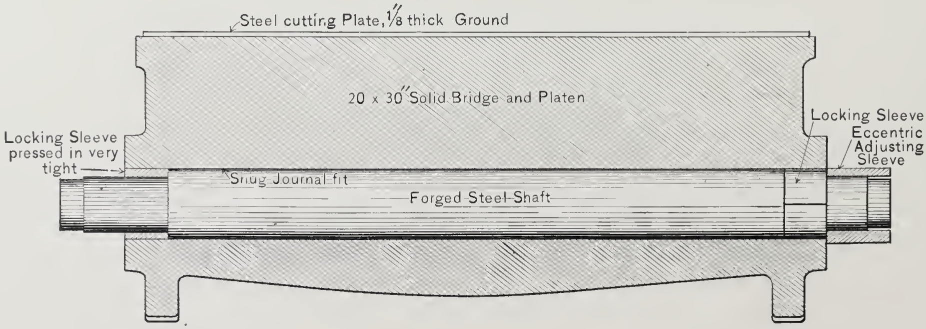
For this purpose we build two types and sizes of presses, one the 20 x 30-inch Crank-action; the other, our 26 x 38-inch Eccentric-action Press. We have now built and sold over two hundred of these presses, and can refer to every paper-box maker of prominence in the country.

We were the first to design a press of the 20 x 30-inch size, and not until we had demonstrated its desirability did others follow, copying up to the line of patent protection.

In the 20 x 30-inch Crank-action Press the platen motion is similar to that of our printing presses—that is, a direct free slide and lock on the impression, the platen rolling out, but positively controlled, to a wide angle. The bed is inclined 15°, but the press may be set to bring the bed to any desired angle, less or more than the degree stated.

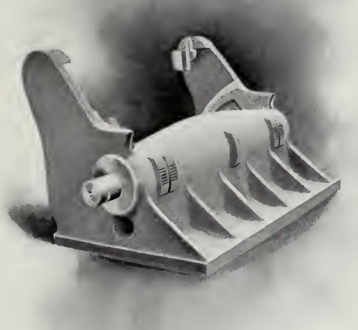
The impression sleeves are of toughest bronze, rigidly secured by bolts and dowel-pins to a steel bar, and all are positively locked to the bridge by two adjuster latches and slides, which engage teeth formed in segments on the bridge. The impression may be increased or decreased to a limited extent by moving the latches to different slots in the segments. A separate rod connects the adjuster latches so that the impression may be thrown off or on by first withdrawing the latches and then swinging the adjuster bar and sleeves up or down.

As to the speed of operation, there is but one limit, namely: the ability of the feeder to place and remove the sheets. For regular practice, however, we recommend from 20 to 30 impressions a minute —that is, 1200 to 1800 impressions an hour—although 2100 and



even 2400 impressions an hour are being regularly made, with complete satisfaction in the operation of the machine.

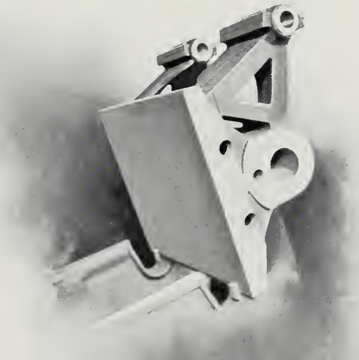
A recent improvement of great importance consists in forming the bridge and platen in one solid structure, instead of in separate parts as heretofore; also in boring the bridge and inserting the shaft, as shown in the detail cut, so that in event of damage *it can readily be removed and a new shaft inserted.*



The belt-shifting apparatus is disposed on top of the machine, the lever being arranged in front of the operator so that it may be instantly grasped and operated.

In the Eccentric-action Paper-box Cutting and Creasing Press, we present our latest and most advanced design in presses for cutting and creasing paper boxes, one that is adapted for the heaviest and most severe duty. It is built to embody the chief principles and advantages of the Eccentric-action Embossing Press, already described, to which description it is requested that reference be made to avoid repetition of detail.

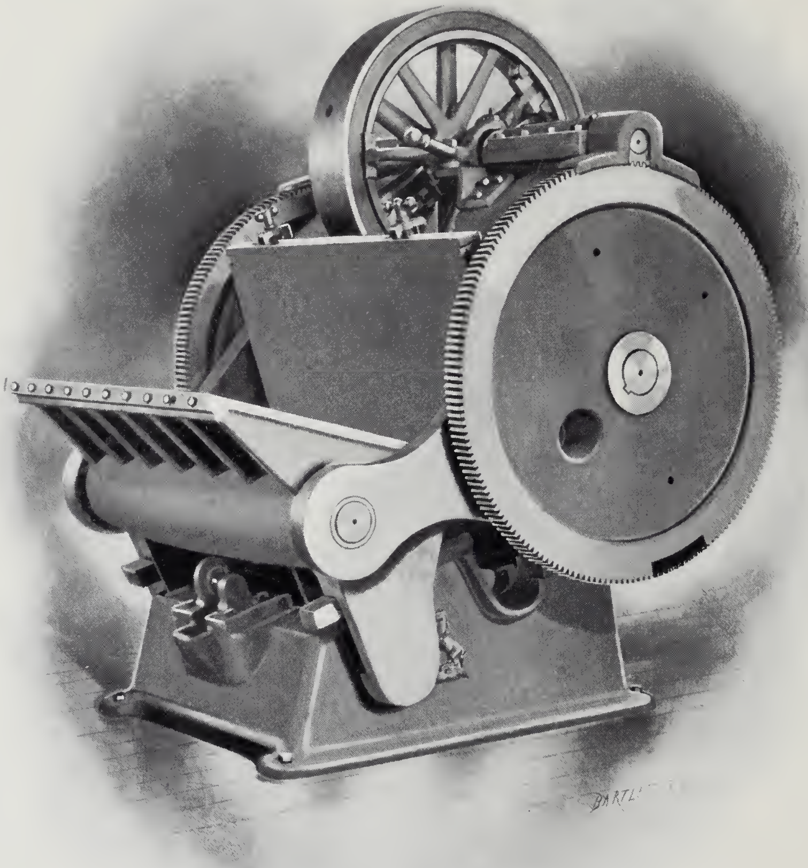
This press is intended for all the regular grades of box work, but in particular for the production of large strawboard boxes, cigarette boxes, cutting out embossed figures, and the "doubling up" of forms which would require to be run singly on the 20 x 30-inch size. Perfectly smooth and durable operation is guaranteed. The rate of operation in regular practice ranges from 1000 to 1800 impressions per hour.



As shown in the engravings, the fly-wheel is mounted upon the top of the bed between the gear-wheels. The advantages of this disposal are: increased compactness, a perfectly central division of the strain to the gears, and the ability to mount the clutch handle directly in front of the feeder.

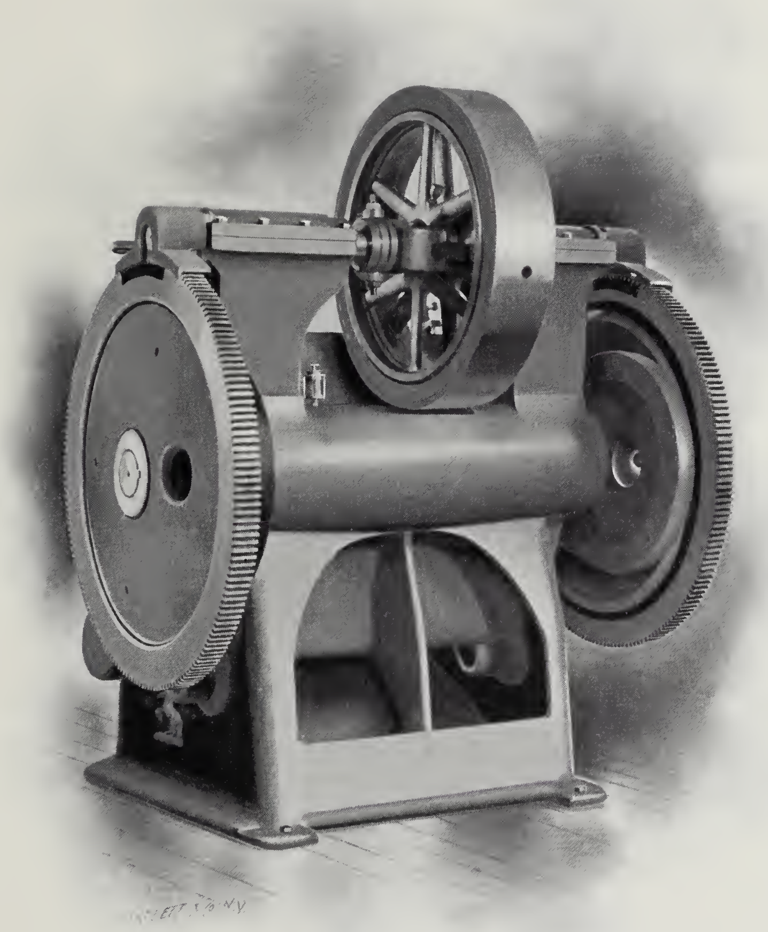
The bridge is peculiar to our system—that is, embodying the essential free direct slide to the die, with the positive interlock and guide of the platen during the impression contact.

The bed is inclined forward 15° from the vertical.



ECCENTRIC-ACTION CUTTING AND SCORING PRESS FRONT VIEW

SIZE 26 X 38 INCHES



ECCENTRIC-ACTION CUTTING AND SCORING PRESS REAR VIEW

SIZE 26 X 38 INCHES

The platen swings out to within about 10° of the horizontal—that is, nearly flat. It is, therefore, easy to feed and convenient to "make ready."

The platen and bridge are made solid. No eccentric adjusting sleeves are furnished, the impression being adjusted by inserting thin sheets of press-board or metal between the cutting plate and the platen. The press is entirely self-contained, every part being connected directly to the frame, and the gears are provided with steel teeth on the impression sections.

The clutch is of the same pattern as the Embossing Press, the clutch-lever handle being likewise provided with a brake shoe, so that the platen may be almost instantly stopped as well as started. Bear in mind that in this press the fly-wheel is like a loose pulley, except only when clutched to the pinion shaft to drive the press. The impression cannot be tripped as in the instance of the printing press; but the platen is *stopped*, the fly-wheel continuing its movement.

In our judgment, it is the most effective machine for the purpose ever brought out; and we commend it to those with whom the ultimate capacity to produce has consideration as well as the first price of the press.

PRICE LIST CUTTING AND SCORING PRESSES

CRANK-ACTION PRESS.—Size, 20 x 30 inches inside of chase. Price, complete, including tables, standards, and one ground steel cutting plate $700 00

Face of platen, 20⅞ x 32 inches. Standard adjustment of platen is for a cutting plate ⅛ inch thick. Net weight, 4240 pounds; gross weight, boxed for shipment, 4750 pounds. Prompt deliveries can usually be made.

ECCENTRIC-ACTION PRESS.—Size, 26 x 38 inches inside of chase. Price, complete, including tables, standards, and one ground steel cutting plate $1200 00

Face of platen, 26¾ x 40 inches. Standard adjustment of platen is for a cutting plate $\frac{3}{16}$ inch thick. Net weight, 7325 pounds; gross weight, boxed for shipment, 8130 pounds. Delivery can usually be made in from one to three weeks.

For dimensions and speeds of pulleys, floor space, etc., see table, page 40.

TABULATED PRICE LIST OF
JOHN THOMSON PRESS CO.'S "COLT'S ARMORY" PRESSES

(Terms and discounts upon application)

These prices include tight and loose pulleys, belt-shifter, brake, ink-fountain, boxing and delivering free on board at Hartford, Conn. For exact specification of parts furnished, see pages 22–24.

PRINTING PRESSES

Name, and Size Inside of Chase	Style One	Style Two	Style Three	Style Four
Eighth Medium, 8 x 12″	$250	. . .	. . .	. . .
Quarto Medium, 10 x 15″	350	. . .	. . .	. . .
Half Medium, 13 x 19″	450	$500	$600	. . .
Half Super-royal, 14 x 22″	515	575	650	$900

ECCENTRIC-ACTION EMBOSSING PRESSES

Face of platen, 12½ x 18½ inches . . . . $1100 and $1200
" " " 18 x 24 " 2750

CUTTING AND SCORING PRESSES

Crank-action, 20 x 30 inches inside of chase $700
Eccentric-action, 26 x 38 inches inside of chase 1200

Important Notice.—The foregoing schedule refers to presses of "regular" adjustment, any departure from which involves an extra charge, to be arranged by correspondence.

DIMENSIONS AND PRICES OF STEEL PLATEN AND BED PLATES OR "BLANKS"

FOR CUTTING AND SCORING EMBOSSING AND SPECIAL ADAPTATIONS

Both faces of these plates are ground and dull polished; the edges are planed and holes are drilled and countersunk.

We do not guarantee these plates as to accuracy; but we believe them to be the best procurable in the market, the error of flatness or thickness rarely exceeding 0.002 to 0.004 inch. The steel is of moderately high carbon and will stand considerable hard pounding before buckling.

Name and Size of Press	Face Dimensions of Plate (Equal to Face of Platen)	Thickness	Price
Crank-action Cutter and Creaser, 20 x 30″ inside of chase	20⅞ x 32″	0.125″ (⅛″)	$8 00
Eccentric-action Cutter and Creaser, 26 x 38″ inside of chase	26⅝ x 40″	0.187″ ($\frac{3}{16}$″)	18 00
Eccentric-action Embosser, 12½ x 18½″	12½ x 18½″	0.125″ (⅛″) 0.250″ (¼″)	5 00 9 00
Half Medium, 13 x 19″ inside of chase	13⅜ x 21⅝″	0.125″ (⅛″)	6 00
Half Super-royal, 14 x 22″ inside of chase	14⅛ x 24½″	0.125″ (⅛″)	6 50

DIMENSIONS AND DATA USEFUL IN THE INSTALLATION AND STARTING UP OF JOHN THOMSON PRESS COMPANY'S "COLT'S ARMORY" PRESSES

Size of Press Inches	Floor Space without Feed Tables Inches	Face of Table Inches	Floor Space of Table Base Inches	Space through which Press will pass			Center of Fly-wheel to Floor Inches	Face and Diameter of Driving Pulley Inches	Width of Belt Inches	Revolutions of Fly-wheel to each Impression	Fastest Speed Impressions per Hour
				Assembled Inches	Partially Stripped Inches	Entirely Stripped Inches					
Eighth Medium 8 x 12	42 x 29	8¾ x 14	9 x 9	29	23	17	22¾	2 x 9⅞	1¾	5	2600
Quarto Medium 10 x 15	45 x 33½	12 x 18¼	13½ x 13½	33½	26	19	19¾	2⅜ x 12	1¾	6	2600
Half Medium 13 x 19	48 x 41	14¾ x 22½	13½ x 13½	41	29	23	19	3 x 14	2½	8¼	1800
Half Super-royal 14 x 22	48 x 44	14¾ x 22½	13½ x 13½	44	32	26	19	3 x 14	2½	8¼	1700
Crank Cutter 20 x 30	44 x 48	18½ x 2 ½	18½ x 18½	44	39	33	20½	3⅞ x 17⅞	3½	5¼	1800
Eccentric Cutter 26 x 38	51 x 54	24½ x 27½	18½ x 18½	51	51	40	52¾	6¼ x 30	4	9¼	1500
Embosser 12½ x 18½	48 x 49	14¾ x 22½	13½ x 13½	48	27	24	31½	6¼ x 30	4	8½	1800
Embosser 18 x 24	84 x 60	18½ x 28½	18½ x 18½	60	37	24	42½	6¼ x 32	4	10¼	1500

NOTE.—In all of the above presses, the fly-wheel should revolve *towards* the feeder.

SHIPPING INFORMATION

APPROXIMATE WEIGHTS DIMENSIONS OF PACKAGES ETC

Designation of Press		How Divided and Packed	Dimensions of Packages Inches	Weights, Pounds		
Size, Inches	Style			Net	Tare	Gross
Eighth Medium 8 x 12	One	Press, Crate	43 x 35 x 26.5	685	140	825
		Parts, Boxed	39 x 39 x 9.5	225	100	325
				910	240	1150
Quarto Medium 10 x 15	One	Press, Crate	48.5 x 41.5 x 30	1125	185	1310
		Parts, Boxed	39 x 39 x 14	375	150	525
				1500	335	1835
Half Medium 13 x 19	One and Two	Press, Crate	53 x 46.5 x 35	1680	220	1900
		Parts, Boxed	43 x 39 x 14	405	165	570
				2085	385	2470
Half Medium 13 x 19	Three	Press, Crate	53 x 46.5 x 35	1780	220	2000
		Parts, Boxed	47.5 x 41.5 x 16.5	550	225	775
				2330	445	2775
Half Super-royal 14 x 22	One and Two	Press, Crate	53 x 46.5 x 38	1860	265	2125
		Parts, Boxed	43 x 39 x 14	410	170	580
				2270	435	2705
Half Super-royal 14 x 22	Three	Press, Crate	53 x 46.5 x 38	1960	265	2225
		Parts, Boxed	47.5 x 41.5 x 16.5	550	225	775
				2510	490	3000
Half Super-royal 14 x 22	Four	Press, Crate	52.5 x 46.5 x 39	2448	282	2730
		Parts, Boxed	43 x 39.75 x 13	422	116	538
		Fly-wheels	41 x 41 x 9.5	406	94	500
		Pinion Shaft	63 x 5 x 5	60	17	77
				3336	509	3845
Crank-action Cutter & Creaser 20 x 30		Press, Crate	54.5 x 46 x 46	3000	250	3250
		Parts, Boxed	36.5 x 22.25 x 20.75	275	100	375
		Chases	36 x 29 x 6.5	235	40	275
		Pinion Shaft	70.25 x 7.25 x 7.5	70	30	100
		Wheel	40.25 x 40.25 x 6.25	330	45	375
		Wheel	40.25 x 40.25 x 6.25	330	45	375
				4240	510	4750
Eccentric-action Cutter & Creaser 26 x 38		Press, Crate	64 x 60 x 55	6200	450	6650
		Head, etc.	55 x 33 x 33	815	275	1090
		Chases, etc.	45 x 35 x 8	310	80	390
				7325	805	8130
Eccentric-action Embosser 12½ x 18½		Press, Crate	63 x 52 x 48	3500	450	3950
		Parts	38 x 18 x 12	100	50	150
				3600	500	4100

CONSTRUCTION OF "COLT'S ARMORY" PRESSES

MATERIAL

We make no pretensions to a monopoly of "the best material;" the market is here open to all alike. But we do entertain the belief, which is based upon some knowledge of general usage, that the materials which we *select* for the several duties to be performed, are better and more expensive than those usually accepted for analogous purposes.

When cast-iron can be run, in one heat, to pull at from 15,000 to 18,000 pounds to each square inch of section, and at the next heat, at from 25,000 to 28,000 pounds; with steel ranging in tensile strength from 50,000 to 250,000 pounds, having an elongation of from 1 to 40 per cent.; with fancy compositions purchasable at from 15 to 30 cents a pound, and whose appearance is "as nearly alike on the outside as a good egg and a bad," * then, we submit, there is room for the exercise of skill, experience and intention.

WORKMANSHIP

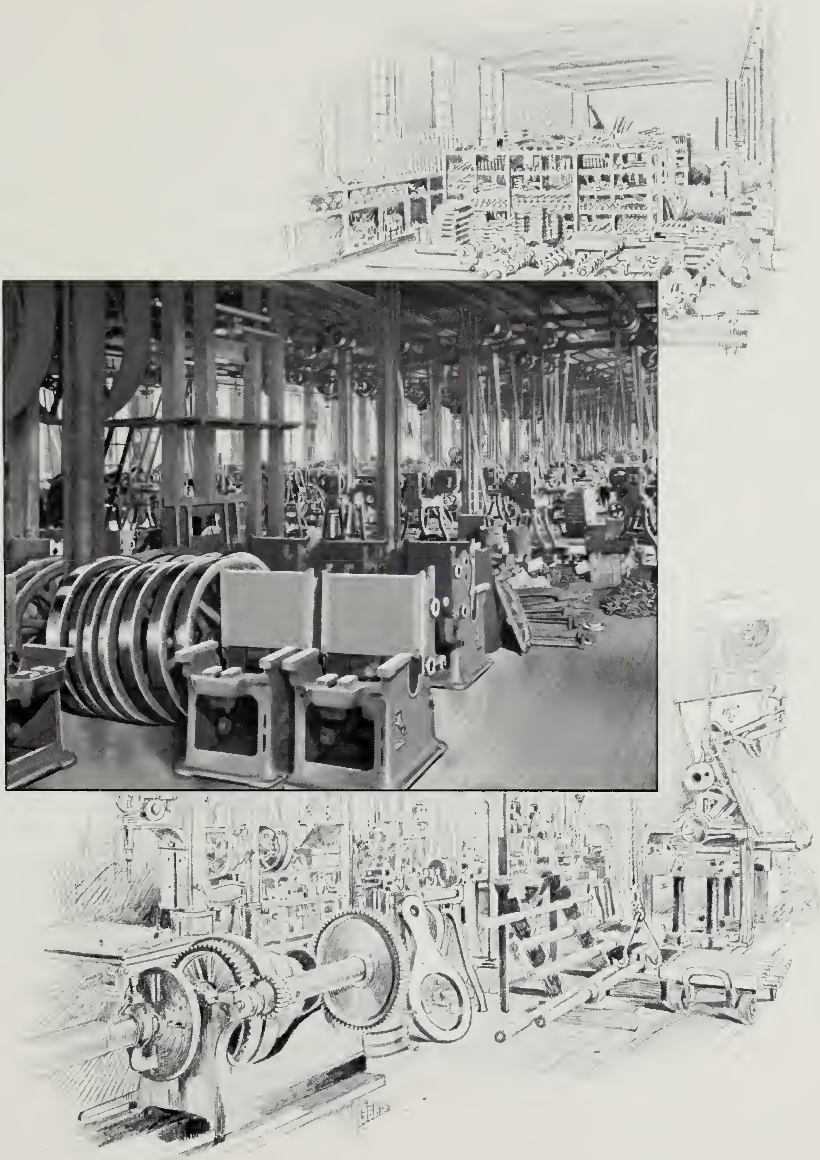
In respect to the quality of our workmanship, we claim to be "second to none," either in the field of platen or cylinder presses. Our manufacture is conducted upon the interchangeable system; and such parts as crank pins, shafts, connecting rods, cylinders and gear-wheels are usually carried through in lots of several hundreds. Then, too, our system of inspection is based upon many years of experience in the class of fire-arms, under the most rigid scrutiny of U. S. Government inspectors, and the superintendence at the armory is of the highest order; the result being to practically eliminate errors of construction and assemblage.

TESTING

Immediately after a press is assembled, our regular practice is to run it under moderately heavy pressure, at fast speed, while being closely watched by a skillful mechanic, to bring the bearings to a moderately glazed surface; sufficient, at least, to ensure satisfactory operation under proper conditions.

But we cannot too strongly advise, and urge upon the attention of, our clients, to their advantage, that they supplement our efforts by devoting a few days of close and constant supervision when starting up the press. In this connection, see the paragraph, page 46, entitled "Oil"; also first two paragraphs of page 67.

* From Charles A. Dana's speech to the students of Union College.



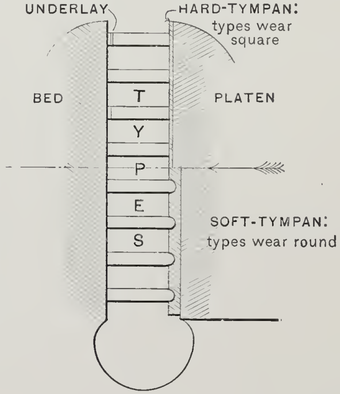
A FEW SUGGESTIONS ABOUT LETTER-PRESS MAKE-READY AND OPERATION

Where a type or cut appears low, it is usually preferable to underlay rather than to overlay, as this brings the faces to a plane.

If a slur appears, the shift being in a direction crosswise of the platen, it will be caused by the form being out of proper center, or by improper contact of the frisket fingers. The remedy, if due to the form, is to shift or reverse it; but if this is impracticable then give the platen a bearing, say, against four heavy-faced types set in each corner of the chase. While this puts more strain upon the press the supports act to prevent deflection. This treatment, however, is rarely called for. Should the fault be in the frisket fingers it will probably be due to their having been bent or to the use of a thicker tympan than we adjust for. To test the accuracy of contact of the fingers, carry the platen forward until they lie upon the tympan, having first inserted strips of paper under the fingers top and bottom. Withdrawal of the strips will show, by the tension, where the contact is heaviest. If this is at the top, bend the fingers outward; if at the bottom, this can be corrected by inserting cardboard washers between the fingers and the face of the frisket frame. A blur is often mistaken for a slur; which may be caused by a baggy tympan, the sheet being carried outward by the suction, or by *soaking* the form with ink.

CHARACTER OF TYMPANS

In the operation of platen presses we have long been "sticklers" for the use of hard tympans. So much has been said upon this subject, *pro* and *con*, that but little room is left for more to be said; in fact, there is none, except to briefly repeat an old story in the hope that it may be heard by young ears. This diagram illustrates, in kindergarten fashion, why new sharp-edged types, if brought into fair, square contact, under heavy pressure, upon a smooth, hard packing, of, say, but three or four sheets, will last longer, will produce better effects and will



use less ink than when the same types are forced into a yielding cushion. The reason is that in the instance of the hard packing you have pressure without appreciable movement; whereas, in the case of the soft packing you have both pressure and movement. To illustrate, take a sharp knife and press its edge against a piece of glass; the edge will stand. Again, force the edge against the glass under the same pressure and also draw it along the hard surface; the edge will turn. In each instance the pressure is alike; but in the one case it is the static condition, force without motion; while in the other case it is the dynamic condition, pressure with motion.

As to the tympan, it should be hard, smooth and be composed of few sheets rather than of many. Its character, that is the degree of hardness or resiliency, should vary with the work and the form. The "artist" who would print the usual electrotype, a half-tone, a wax-line engraving, or a form of new types on the same tympan would probably be surprised at the difference in the results if he adapted the tympan to the conditions. But this is something that cannot be taught on paper; the sense is an instinct; if you haven't it, better quit.

INTENSITY OF CONTACT OF FORM-INKING ROLLERS

In the inking of the form, especially in half-tones and the like, we cannot urge too strongly the importance of looking after the degree, or intensity, of the contact made by the form rollers. In the great majority of cases, the rollers are permitted to impinge too heavily, being flattened into broad flat contact surfaces, thus tending to apply too much ink and to fill the cavities of the plate. In view of the great shrinkage which takes place in American roller composition, the best method of counteracting this difficulty of roller contact is to provide a plurality of form roller wheels, or "trucks," of varying diameters.

The education which has come to pressmen, from the use of disk presses, almost invariably tends to the application of too much ink. This is not only a waste of material but a detraction in the result. To those who have not tried it the experiment is well worth the making of running a job with the ink slapped on, like whitewash, or laid on, as with a camel's-hair brush.

GRAPHITE

For lubricating the rockers, rocker-seats, cam-ways, slides or gearing of printing presses, most satisfactory results can often be obtained from the use of pure, soft, flake-graphite. It can also be obtained in the form of cylindrical plugs, very convenient to apply, as put up for use on bicycles.

OIL

We send with every press a small can of oil; the object of which is published on the label attached to the can, from which we here quote as follows:

"This can of oil is furnished free for use in starting up, and we particularly request that, at least during the first ten days of operation, the bearings be wiped off thoroughly, and that the oil be applied sparingly, but frequently, to every working part of the press.

"We regard this oil as especially well adapted for use on printing or embossing presses; it will not gum, and, while free-running is yet possessed of ample body to withstand the heavy pressures borne by the connections.

"A new machine so started that the bearings become 'glazed' to a hard, smooth surface has many times the advantage over a press which takes its chance of survival from a 'lick and a promise.'

"But the most painstaking care will not counteract the use of a poor lubricant. Improper oil has caused us more trouble than any other fault we know of; hence we are seeking to avoid this annoyance by seeing to it that you have the means for making a proper start."*

ELECTRIC MOTORS

Our experience justifies us in recommending the use of electric motors for driving our presses; the most efficient method being to connect a motor to each machine.

Motors of from one-fourth to one-half horse-power are usually sufficient for ordinary usage. When operated at maximum speed, the shaft of the high-speed type of motor revolves at from 1200 to 2500 revolutions a minute; hence, it requires to be indirectly connected to the pinion shaft of the press, as by belt and pulley, or by pinion and gear.

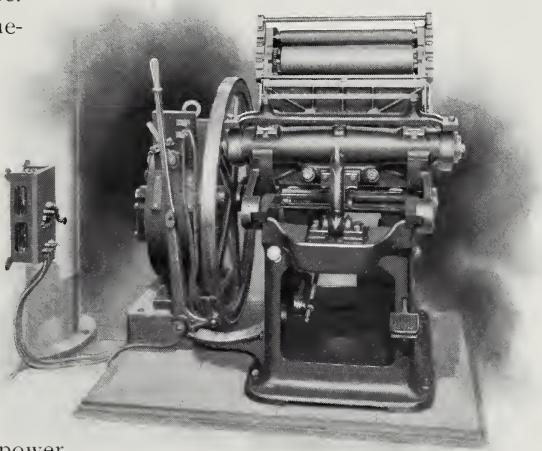
* Also see pages 66–7.

But in the low-speed motor, the connection may be made by direct attachment to the pinion shaft, thus obviating all intermediaries.

When gearing is used, to obtain smooth operation with the least noise and vibration, the pinion which is applied to the motor shaft should be of raw-hide or vulcanized fibre.

The switch may be connected to the brake handle of the press, so that when the handle is forced over to stop the fly-wheel the circuit will be cut by the same movement.

Ordinarily, in these applications, the question of power economy is of the least importance. This may appear a somewhat heretical assertion; but the facts are now well established that the convenience, the increase of light, the decrease of dust, and the higher speed of operation, are factors of much greater consequence. In other words, the advantages derived are quite out of proportion to the cost of installation and of power.



It may be of interest to mention that the use of the electric motor, when properly provided with apparatus for readily controlling the speed, has resulted in an unexpected advantage, namely: an increase in the average rate of operation. It, in fact, has been an educator to a higher rate of output.

The excellent, if not ideal, exhibit here illustrated, can be seen in our office; where a Half Medium "Colt's Armory" Press, Style Two, is driven by a Card direct-connected motor at speeds of from 20 to 40 impressions a minute, that is, 1200 to 2400 an hour.

SHAFTING AND PULLEYS

Too often a short-sighted policy is followed in the "lay out" for counter-shafting and cone-pulleys; saving $5 in the plant to lose $20 in the output. We can often be of use to our patrons in such matters; to whom our services are subject to command.

A FEW TECHNICAL FEATURES

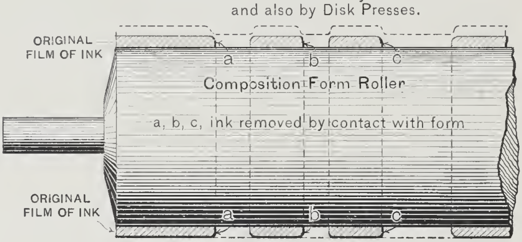
It has been thought that it might be of benefit and interest to amplify a few of the technical features involved in the construction of our presses, especially to bring out as clearly as may be the essential or foundation principles.

ELEMENTS OF INK DISTRIBUTION

In the matter of ink distribution there is probably more fog and difference of opinion as to what constitutes true distribution, and as to its differences in degree, than in any other matter connected with the operation of printing presses. Broadly, there are but two kinds or classes of ink distribution, namely: First, that obtained by rolling contact only, such as by revolving a roller over a plate or against a cylinder, and, second, that obtained by a combination of rolling and rubbing, as in the differential movement of the cylinders in an ink mill or the combined revolving and reciprocating, or back-and-forth, movement of the riding changer common in cylinder presses.

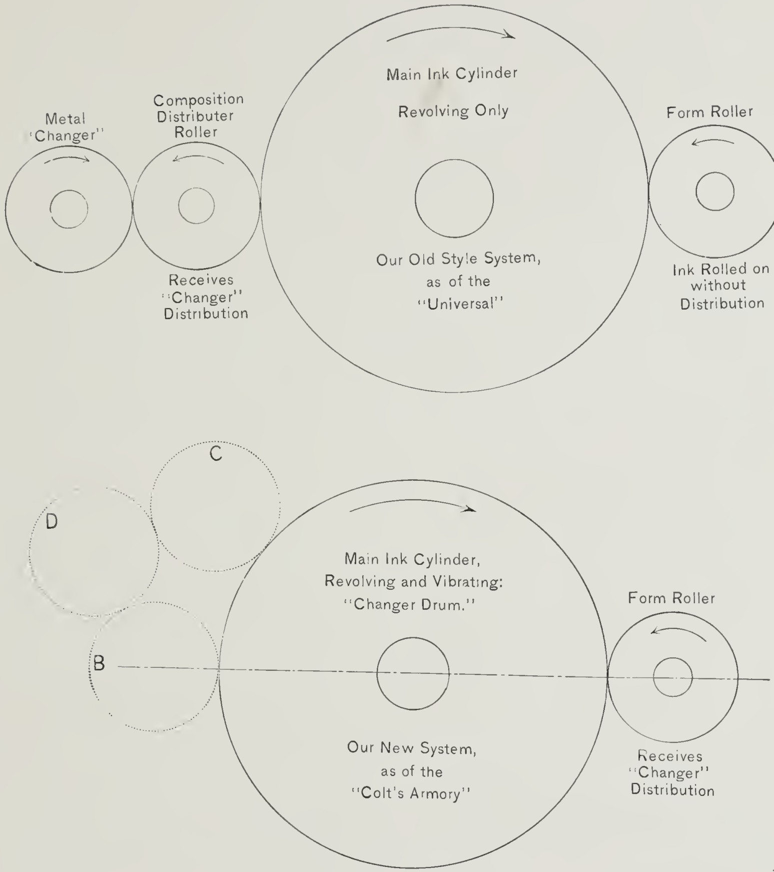
It may be said of rolling distribution that it applies the ink cylindrically in circles around the rollers, whilst rubbing distribution spreads the ink sidewise. Rubbing and rolling combined produce a film of ink of uniform thickness without furrows, ridges, lines or lumpy inequalities. To produce the best results, the inking rollers of a printing press are required to do over again, in part, the work of the ink mill; that is, grind, distribute, dispose a mass of sticky paste into a semi-fluid tissue whose uniformity of thickness shall be the nearest possible to perfect.

Variable Ink-film as rolled on by the "Universal," and also by Disk Presses.



Uniform Ink-film as rubbed on by the "Colt's Armory" "Changer" Cylinder

The difference between the area of ink-carrying surface and the effective distributing surface is not always as clearly distinguished as it should be. Thus, if a cylinder 10 inches diameter by 20 inches in length, having ten composition rollers, 2 inches diameter, in "vibrating" contact therewith, is revolved once in 20 seconds, the total ink-carrying surface will be equal to 2512 square inches and the



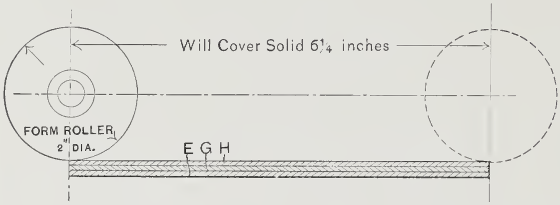
In the above diagram, the full lines show the least number of rollers which will operate and perform practical work, as between the old and the new systems. By adding the distributer rollers, denoted by the dotted lines *C*, *B*, we produce a combination of four elements subjected to changer distribution as against two in the old. The addition of another roller, as *D*, would increase the ink-carrying capacity, the surface area, but would *not* add to the rubbing distribution.

distributing surface of the rollers alone will likewise be equal to 2512 square inches.

But if with the same cylinder running at the same speed we employ five composition distributers, each of 2 inches diameter, as before, we by this reduce the ink-carrying surface, or area, by one-fourth, whilst the distributing surface is reduced by one-half. Hence, it follows that in presses having cylindrical inking apparatus, the distribution can be increased in any given device only by greater speed of revolution or by increasing the number of the rollers which *make contact with the "vibrating" roller* or cylinder.

Therefore, when we designed means for causing our main ink cylinder to reciprocate, and thus perform the function of the old-fashioned "vibrating" roller, this, *without* increase of speed, *doubled* the distribution over that of previous practice. And here is a simple demonstration: A "Colt's Armory" Press is operative with *one* form-inking roller in contact with the cylinder; whereas, in the competitive system the least operative combination requires the addition of one distributer and one changer, in other words two elements as against four.

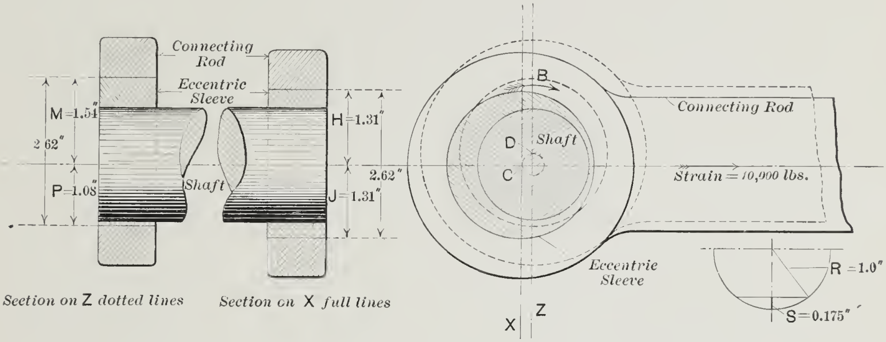
In the matter of form-inking rollers, mere multiplication, especially in many of the finer classes of work, is as likely to be detrimental as advantageous. In our judgment, the way in which the ink is applied to the form roller, its size, the *intensity* of its contact upon the form and the character of the impression, are factors of much greater importance than the number of times that separate films of ink, as *E*, *G*, *H*, are deposited upon the same surface.



ECCENTRIC THROW-OFFS AND ADJUSTMENT

The duty required of eccentric adjusting sleeves is much greater than is usually apprehended by printers, and it is doubtless because of this that these parts are so frequently subjected to excessively severe strain. But possibly this misconception is not so remarkable, in that the principle involved is somewhat obscure, so much so, in fact, that even *clerical* professors have preached false doctrine in regard thereto. "But with what face shall they presume to teach who have never learned?"

Thus, in a recent technical publication, the following statement is made in regard to these parts: "It will be seen that *(sic)* under pressure the sleeve is like two curved wedges, tending to turn on the shaft in opposite directions and *(sic)* therefore holding each other by the friction of pressure." If this statement were true no means for locking would be necessary and these parts would not be broken, as they frequently are, in the competitive system of construction.



The above diagram, if carefully studied in connection with the following description, will make clear to any one the theory and the practice relating to the strains to be resisted when eccentric sleeves are used for adjusting the impression on platen presses, and a proper knowledge of which, we presume to say, led up to the construction herein shown, under which practically no failures have occurred, although over 2000 applications have been made.

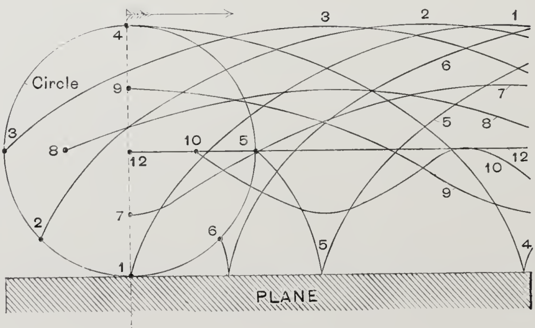
In the full lines of the diagram and in the right-hand section, the eccentric sleeve is shown with its center *C* on the center line of the connecting rod, or on "dead center." In this position a *direct* strain upon the rod is transmitted to and is borne by the sleeve in equal amount upon either side of the center of the strain. The proof of this is readily found. Assume a strain upon the rod of 10,000 pounds and that the diameter of the sleeve is 2.62 inches. Then, the distance from either side of the *present* center of the sleeve will be equal to half its diameter, or 1.31 inches, as see *H* and *J*. Therefore, $\frac{1.31}{2.62}=0.50\times 10{,}000=5000$ pounds on each side of sleeve; hence, it is in balance and would not tend to revolve upon the shaft. But in practice the sleeve is rarely, if ever, on the "dead center." Assume it shifted to the position shown in the dotted lines and in the left-hand section. The center of the shaft, bear in mind, remains fixed as before, but the center of the sleeve is now shifted to *D*. Consequently, as shown at *M* and *P*, we have a differential radius, 1.54

inches at M, above the center of strain, with but 1.08 inches at P, below the center of strain. By the same process as before, we find: $\frac{1.54}{2.62}=0.5875\times10{,}000=5875$ pounds upon the upper "curved wedge," and $\frac{1.08}{2.62}=0.4125\times10{,}000=4125$ pounds upon the lower "curved wedge;" whence, $5875-4125=1750$ pounds of torsional stress tending to cause the sleeve to *revolve* upon the shaft in the direction indicated by the arrow B. Mathematically expressed, as shown in the diagram, the torsional effort (F) would be as the versed sine (S) to the radius, (R), or $F=\frac{R}{S}$. It is also claimed by our *savants* that "the friction of pressure" (whatever distinguishing kind of friction that may be) as between the shaft and the sleeve is a factor tending to resist the rotation of the sleeve. This is doubtless true, to a certain degree. It is likewise true that friction increases with and is a function of the *diameter* of a bearing; hence, as the connecting rod acts upon the *outside* of the sleeve, the greater diameter, the "friction of pressure" is materially greater here than upon the shaft, and this effect requires to be *added* to the theoretical figures submitted! The pressman who has fully grasped the foregoing will not fail, we think, to set the eccentric adjusting sleeves of his press as near to the "dead center" as practicable when printing or embossing a heavy form.

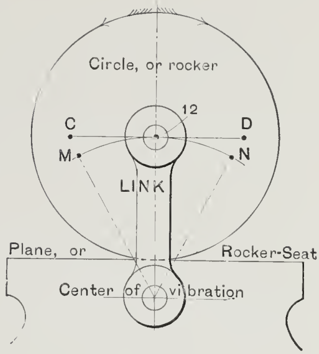
THE CONTROL OF ROLLING AND SLIDING PLATENS

In controlling the action of platens which roll to and from the bed and make a slide to the impression, but two methods have been found available; first, by a combination of links and springs, as in both the old and competitive styles, and second, by means of a cam attached to the platen, this being the new style as broadly covered by us. For rolling platen actions, *all link and spring devices have been exceedingly unsatisfactory.*

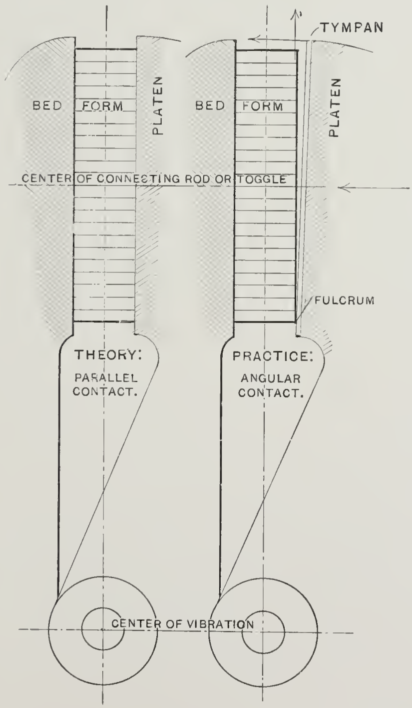
Any one can readily understand the reason for this by referring to the accompanying diagram, showing the curves traced by the points in the circle, representing the "rocker" of a press, when rolled on a plane, corresponding to the "rocker seat." Thus, if a link were pivoted at the center,



12, and fixed in the rocker seat, the device would be inoperative, because the said center seeks to travel in a straight line, as from C to D, whilst the center of the link must describe the arc of a circle, as M, N. Now, as all the curves described by the points 1 to 10 are cycloidal arcs, each different from the other, and none of which approximates the arc of a circle, it is evident that any link acting in the arc of a circle must produce an exceedingly unmechanical operation. As a matter of fact, it does, as is well known by mechanical experts, by dealers in printers' supplies, by printing press repairers and by printers, *from dearly bought experience.*



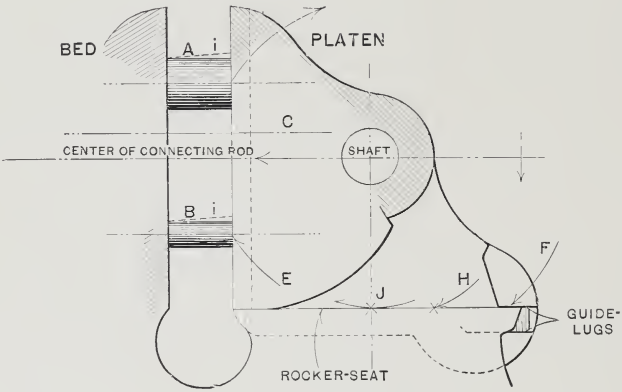
We assert in the most positive terms that the only method for the control of the rolling and sliding platen movement, at once theoretically sound and which long and severe practice has fully demonstrated, is our cam system; *whose contour can be made to correspond,* in any degree of exactness desirable, *to that of the cycloidal arc in which it swings.*



CHARACTER OF PLATEN CONTACT

In platen presses there are two distinct systems for impressing the sheet upon the form; first, the angular contact, such as would be derived from a pair of tongs or a nut cracker, the pressure being greatest near the pivot, growing less and less as you recede therefrom, this being of the old style; and, second, the direct or parallel impact, such, say, as is made by a letter-copying press, imparting a uniform degree of pressure to every portion of the form, this, the new style method in platen presses, being now, in its theoretical perfection, *exclusively ours.*

The principle involved in the old style of angular contact is shown in the diagram on the preceding page, which proves, beyond all cavil, that in every practical instance where a form is brought into angular contact with a yielding tympan, the first instant of impact will either be at the top or bottom of the platen; the consequence of which is to tend to crowd the form off its feet, to produce an unequal indentation, and to wear away the sharp edges of the types. But in our system the free platen is drawn to the form without the slightest restraint, in parallel lines, through a space of from $5/8$ to $3/4$ inch, like the cross-head of an engine in its slides, and the result is theoretically perfect impact over the entire surface of the form. And yet the proper control and guidance of such an action, under heavy strain and subjected to the varying conditions of practice, is not without difficulties; as is indicated in this diagram.



Thus, it rarely happens that the actual center of pressure coincides with the center of the connecting rods, and whenever this condition is found, then there is a *difference of pressure* to be resisted by the structure.

AN EXCEEDINGLY IMPORTANT PRINCIPLE

Whenever it is possible, pressmen ought to adjust their forms, in any platen press, so that the center of pressure shall approximately coincide with the center of the applied strain. Especially should this be done in the instance of embossing presses, as the failure to take account of this principle frequently causes the force to "crawl" and break down; the tendency being, of course, to flow to the position of least pressure. Referring to the diagram, if the centers of plugs, *A* and *B*, are at equal distances from the center of the connecting rod, but if the plug *A* has twice the surface of the plug *B*, then the center of pressure will not coincide with that of the connecting rod, but will be above it, say, as at the line *C*. The effect of this is to tend to cause the plugs to rise, as at the dotted lines *i*, and the platen to swing as indicated by the arrow, *E*.* The resistance to this action comes from the guide lugs of the platen, which engage over and under the rocker seats; and it will now be clear why it is desirable to have a *long slide*, whereby to obtain ample bearing surface under the faces of the guide lugs, and also why the effectiveness of the control increases with great rapidity the farther the guide lugs are carried outward from the center line *J*; the arrow *H* indicating the competitive practice, having a tendency to cramp, while the arrow *F* denotes our construction, or, in effectiveness, as nearly three to one of the former.

CONTOUR OR DESIGN OFTEN DENOTES THE QUALITY

In the opening of this catalogue, we have referred to curves and curlycues in their relation to the design and efficiency of a machine. There is more in this than might at first be supposed; for the principles involved are of the greatest importance. The "lines" in a machine are somewhat like physical symptoms in individuals, indicative of the state of health. The omission of a fillet where one line joins another, as in a casting, or a journal, may cause complete failure. So, too, the placing of a curve where a straight line is the better may produce a similar result. Consideration of these simple propositions may be of value to those who do not pretend to have expert knowledge, if applied as a "symptom" when in the market as purchasers. Thus, any one competent to turn a door-knob, knows that a crow-bar made like this

would not be a desirable design; that a straight bar, tapering from toe to handle, would be much the better. And yet see how this well-known principle is violated. Look at the illustrations in catalogues and ad-

* See also pages 65–6.

vertisements. Observe the fly-wheels and pulleys, whose arms, having the form of a grape-vine, are caused to perform the function of a lever. Then cast a glance at the scrolls in the framing and ask yourself if a bridge were thus built whose tension and compression members were curved and curlycued, would you regard it as a proper construction? Most assuredly you would not. Then why not require at least as good engineering in your presses as you would if acting as commissioners in the construction of a bridge or a locomotive?

A LIBEL ON FIRST PRINCIPLES

The claim has recently been made, in regard to the frame and bed of a competitive machine, "that springing or breaking under strain is impossible;" also that "absolute rigidity" is obtained. And this assertion refers to a simple chambered bed, as if it were new: a construction which dates back to the pyramids, at least! However, our contention is not to the novelty of the "invention" (which we, by the way, also employ) but to the statement in respect of its capabilities, the effect of which, if believed, would be detrimental to you and to us. No bed or platen has ever been made that will not spring under strain. "Absolute rigidity" is unattainable. To covertly imply that a chambered structure, whose external dimensions are the same as those of a solid, is more rigid than the solid is simply not a fact. In general terms, it may be said, that in the instance, say, of a hollow column with the *same quantity of metal* as a solid, then the chambered construction will be the stronger of the two. In other words, the beds of presses are chambered either to *save iron* or to prevent excessive shrinkage strains. To assert any other motive is simply a subterfuge. In many of our presses the beds are of solid iron, and if we could compress more material into the given space we would do it. Occasionally, solid beds are cast with one or two round cores passing through, lengthwise, these openings being to assist in cooling the mass after casting. Beds of large size are more troublesome to cast solid than when cored; but when properly made they are much stronger and more nearly approximate the limit of *practicable* rigidity. The main connecting rods of a press are merely great springs, which stretch and react under every impression. The most expensive, the most accurate, and, in fact, the best presses we have furnished were made with solid beds and platens, in which the sides were purposely scraped low by several thousandths of an inch to allow for the *spring of the parts* "under strain." In this connection it may be of interest to add, that all of the platens applied to our Styles One and Two machines are planed high in the center, and are then sprung flat by the supporting jack-bolts in the bridge. This introduces an initial stress which tends to prevent them from pounding low. If not strained by subsequent operation beyond the limit of elasticity, the original degree of flatness of the platen should continue indefinitely. And yet the degree of accuracy which can be attained when the principle of the problem is properly understood, and the work skillfully executed, is rather remarkable. Thus, in a test for "sensibility," upon a solid type form of over 200 square inches area, a single sheet of paper, 0.003 inch in thickness, has sufficed to bear off the impression at each extremity of the platen. But such results cannot be obtained—that is, with us—if the work is carried out upon the theory of "absolute rigidity."

THE WEIGHT OF FLY-WHEELS

On several occasions we have lost the sale of presses because the fly-wheels on other machines were considerably heavier than ours and were "warranted not to stall on the impression." In one instance, the matter had been investigated by a learned professor of dynamics, who reported us adversely because our fly-wheel lacked of *vis viva*. Well, the fact is, we ourselves have done considerable "figuring" on this subject; we have put forth a legitimate endeavor to "sustain theory by practice," for they are not applied according to the formulæ of *guess and trust*. It is annoying, undoubtedly, to have a press "stall" on the impression; but we also submit that it is something more lasting than mere annoyance when the fly-wheel goes over and the press falls in two! The practical difficulty to be met is in the variable loads and the different rates of operation. Thus, if a press is properly designed for a maximum load at a maximum rate of, say, 1200 impressions an hour, and is speeded up to 1800 impressions, that is an increase of 50 per cent., then the impressional power of the fly-wheel will be *doubled*, that is, increased 100 per cent. Hence, while the press may be capable of operating satisfactorily at the higher speed, yet if, at the higher speed, it is loaded to the *capacity* of the fly-wheel to carry over, in the one instance the press will be safe; in the other instance it will be seriously overstrained or smashed. It may be well to here mention that the principle is that the motive energy, the power, of a fly-wheel corresponds to the square of its velocity in feet per second (V^2), and that its measure in *foot-pounds per second* (terms which must not be confounded with pounds *weight*) is found by multiplying half of the weight, or mass, at the center of gyration ($\frac{1}{2}M$) by the square of the velocity in feet per second ($\frac{1}{2}MV^2$). Thus, if we have half of a certain mass which is equal to 100 pounds moving with a velocity of 10 feet a second, the product in foot-pounds would be, $10 \times 10 \times 100 = 10{,}000$ second foot-pounds of energy. Suppose the speed doubled, that is, increased to a velocity of 20 feet a second, then $20 \times 20 \times 100 = 40{,}000$ foot-pounds, or *four* times that of the lower speed.* Hence, we submit that the manufacturer who unreservedly "guarantees" against such a condition, without limitation as to speed, does not understand the situation and his representation is valueless. Our effort has been to furnish presses with ample fly-wheel capacity to produce the desired results under proper manipulation, at the maximum rate of operation, but with such a reserve of resistance in the machine (its factor of safety) as to minimize the damage should the full capacity of the fly-wheel be accidentally taken up at its maximum rate of operation. A contingent advantage of this method is that when a symptom of "stalling" appears it usually indicates an error in the make-ready, the immediate correction of which may avert a break-down. But there are conditions when the proper weight of wheel for the maximum speed cannot be applied, as in the case of presses which must be operated under very heavy impressions at slow speed, for one class of work, and at high speed for another class. In such instances, the fly-wheels require to be heavy enough for the slow-speed operation; hence, they are too heavy for the high speed. The most practicable remedy would be to provide two or more fly-wheels of different weights; but this involves changes, and operators usually prefer to take the risk, rarely failing, however, to pay their respects to the manufacturer should their temerity result in a smash.

HOLES IN FACE OF FLY-WHEELS

The holes which are shown in the face of the fly-wheels of our Eccentric-action Presses are for two purposes: First, to try the impression before starting up; also as a convenience in some methods of make-ready, and, second, to work off the impression if "stalled." The holes are drilled through, and are 1¼ inches in diameter.

* In this connection, see pages 67-8.

SAFETY CLUTCH

The clutch of our Eccentric-action Presses is capable of being adjusted with great nicety; as the threads of the toggle levers are very snugly fitted, the nuts are hardened and the entire structure is exceedingly rigid. Hence, it is feasible, in some cases, to set the clutch-wedges so as to just carry over the impression, but to slip and relieve the press should additional sheets be inserted. However, this feature is seldom made use of; for the reason, we presume, that it involves considerable experimenting to obtain the proper degree of friction, and then it "makes trouble" if it works.

PRESS THEOREMS

In a practically perfect press, provided with an equally perfect form, no make-ready would be necessary. While such a construction is mechanically possible it is not commercially feasible, as the first cost would be greater than the advantage gained in operation. Very close approximations have been made, quite to the limit of practicability; the said limit being the degree of uniformity in the height of the types.

The film of ink impressed upon a sheet should, in the majority of instances, be as thin as possible. If too thick it may be forced out, sidewise, especially so if the sheet is hard and highly surfaced. A powerful unyielding impression with a thin deposition of ink will usually accomplish better results than a heavy coating under a yielding or insufficient impression.

The thickness of the film of ink impressed upon a sheet of paper by a solid tint-block may be ascertained by weighing a quantity of sheets before and after printing, having first ascertained the volume of the ink in cubic inches to the pound. Thus, assume a tint-block of 10 inches area and that 1000 sheets weigh 0.5 pound more after printing than before; also that there are 30 cubic inches of ink to the pound. Then, $0.5 \times 30 = 15.0$ cubic inches of ink applied to the sheets, and $\frac{15.0}{1000 \times 10} = 0.0015$ inch, the thickness of the film. The thought to bear in mind from the foregoing illustration is this: in such a job, doubling the thickness of the film would not better it, but it would double the cost of the ink.

All sliding surfaces, like rockers, rocker seats and cams, either open or closed, should be frequently wiped and scraped clean, to brightness, but emery in any form should *never be used.* For such purpose a soft pine stick dipped in clean oil and plumbago serves admirably, and when so treated the surfaces will become glazed, burnished, planished, and the durability, when proper metallic couples are provided, is marvelous.

A form of small surface, but requiring heavy pressure, is more severe on platen presses than when a form of larger area requiring the same or even heavier pressure is employed. Beds and platens may thus be pounded low, as if compressed or peaned by hammering, and well-defined cases of crystallization have been observed as the result of long usage under such conditions.

In presses for cutting, scoring, stamping or embossing, long life can only be ensured by the employment of great masses of material, or of metal possessing high elasticity. The principle is like that of an anvil; if too light for the blow, useful work is expended in producing movement or vibration which a greater mass, from its inertia, would resist, absorb and transmit to the part being acted upon.

A printing machine in regular service ought to be served like the deck of a man-of-war —*holystoned at the tap of the bell!*

THE COMPETITION OF OVER-REPRESENTATION

To the manufacturer, probably the most exasperating of all experiences, at the instant, is to lose a customer simply by making a conservative representation respecting the capacity of his machine. Time and time again have we had the experience of thus passing a purchaser along to a salesman or agent whose representations were so much more inclusive than ours, and so thoroughly "guaranteed" withal, that the grades of iron and steel used in our product were quite without the "magic circle" so drawn. And while the final outcome has usually been personally gratifying, the inevitable result is to lessen, in general, the degree of proper confidence which should exist between purchaser and vendor.

No doubt, as we can vouch for, the fault is often at the door of the user; who may listen, with but scant courtesy, to a suggestion as to selection, adaptation, or method of operation, even when such suggestion may be based upon the result of most careful investigation, or be representative of the combined experience of many. He who will not take account of the experience of others will often needlessly waste time that has already been devoted to reach the same end; but he who builds upon the experience of others may with certainty progress.* Fortunately for the art, and for us, there are many who

*"It may be said that we have been stating a mere truism. Quite so; and the statement that you cannot lift yourself by your boot straps is also a truism, *and a great deal of good energy is wasted by those who forget these mere truisms.*"
COL. H. G. PROUT, M. Am. Soc. C. E., Editor of the *Railroad Gazette.*

prefer to build upon foundations already established, else might a clam-shell yet perform the functions of our "Colt's Armory" Press.

DISSATISFACTION FROM HIGH CAPACITY

Again, to the manufacturer, there is an unsatisfactory class of customers in those who, for a time, make successful use of machinery not properly adapted to the duty for which it is employed. Thus, when a printing press is successfully used for stamping, cutting or embossing, and especially so if used against expert advice, then the conclusion of the user is liable to be that such employment of the machine was disadvised for sinister motives. Yet, the consequent result is almost as certain as the continuation of time, namely: that such over-use, in the great majority of cases, will smash the press, or render it unfit for proper operation as a printing press *per se.* Such experiences to-day are needless, expensive, wasteful, and, as a rule, unsatisfactory to every one connected therewith, in that the "tone," both commercially and as an art, is lowered by such practice. In fine, we do not care for such patronage, at any price or on any terms, which seeks to do twenty horse-power of duty with a ten-horse-power engine; as, too often for the good repute of the manufacturer, when the engine is ruined its original rating will have been conveniently forgotten.

PATENTS AND MAINTENANCE OF VALUE

Many of the patents granted to us are of the broadest scope ever issued by the United States Patent Office; in fact they are generic, having been passed in the class of mechanical movements. Moreover, the number of patented features in our "Colt's Armory" Press is considerably greater than in any competitive machine in the market. We refer to the foregoing to make the point that a purchaser becomes a participant in our monopoly. Consequently, the value as an asset is not liable to sudden and serious diminution. Especially is this true here for the reason that every patented feature has been subjected to the most thorough practical demonstration.

TESTIMONIALS

We could fill this pamphlet with the complimentary endorsements of our clients, but have concluded to omit even a selection therefrom, presuming that any one desirous of calling upon, or corresponding with, users of our presses will not hesitate to make the desire known. We are prepared to furnish lists of our customers to any one properly entitled thereto.

EXHIBITION AWARDS

In the matter of exhibition endorsements, we received the only First Award and Special Mention at Melbourne in 1888; the First Prize, a Silver Medal, at the Paris Exposition of 1889, and at the Columbian Exhibition of 1893, after a careful competitive inspection had been made, the Highest Award in platen printing and embossing presses *was recommended by the jury.* But a diploma was not granted by the executive committee, for the reason (as appeared in the record) that our line of seven presses had been stopped before the close of the exhibition. The aforesaid record did not mention, however, that our power circuit had been cut because we declined to pay *twice* for one installation!

Then there is yet to be mentioned what might, with considerable appropriateness, be termed the Silent Compliment to Merit, that which really means more, we think, than could be expressed in many diplomas, namely: that since the close of the Columbian Exposition at least four European concerns, waiving the formality of consultation with us, have taken up the manufacture of our presses! Still we rest confident in the belief that first hands are the best hands: "The paraphrase can never equal the text." See page 70.

IN CONCLUSION

Of all the artisan professions, that of the printer has paid most dearly for the experimenting of incompetent designers, the self-styled "inventors." We have some dearly bought knowledge of the long-haired variety; whose order of procedure, in machine construction, has been well dubbed, "Patterns first and drawings after!" And this leads us to observe that the difference between the practice of civil engineering and "inventing," is that one starts with a theory and the other with a *guess;* the one is scientifically demonstrated by and at the cost of the originator, the other is experimented upon by and at the *cost of the purchaser.*

In other words, or as defined by that most eminent authority, the Constitution of the Institution of Civil Engineers of Great Britain, "the profession of a Civil Engineer" comprises "the art of directing the great sources of power in Nature for the use and convenience of man," as "in the construction and adaptation of machinery."

We presume to assert that our "Colt's Armory" Presses are the product of the "art" just described, and, so being, they are confidently submitted for the use and behoof of the craftsmen of the Art Preservative of Arts.

This illustration was produced by three impressions, using the primary colors, from Bartlett & Company's half-tone plates. In the original, a French color print, which was adapted for the above reproduction, ten or more printings were required for its execution. The type of machine employed for this work, by the Orr Press is shown on page 12.

PLATEN PRESSES FOR LETTERPRESS PRINTING EMBOSSING CUTTING AND SCORING

Excerpts from a paper entitled "Platen Presses for Letterpress Printing, Embossing, Cutting and Scoring," by John Thomson, Mem. Am. Soc. C. E. Published in the Transactions of The American Society of Civil Engineers, 127 East 23d Street, New York. Vol. XXXII, Dec., 1894.

* * * * * * * * *

The duty required of printing presses is both varied and exacting. Probably in no other class of service is the performance demanded of machinery anything like so severe as in letterpress printing and paper embossing, a condition due to the inherent principles of operation, the frequent urgency of output and occasionally to unskillful attention.

Simple contact between types and paper will not print. Printing requires pressure, hard pressure, very hard pressure, and that, too, with extreme accuracy of movement under great strain.

Rigidity of structure is an essential in all printing machinery, but especially is this so in platen presses. In cylinder printing presses the actual surface in contact at any one instant is but a line the length of the cylinder; but in a platen machine the line becomes a plane surface equal in area, say, to 1000 square inches. It is no contradiction in terms to say that a press may be strong and yet not rigid. A hard, unyielding, solid impression is regarded of importance second only to accuracy of operation.

There are some printers who yet believe, as did the earlier members of the craft generally, that long duration or "dwell" of the platen upon the types is advantageous; but this now is not usually accepted as a fact in practice, nor do we find for it a theoretical basis, to which a single illustration will suffice. Thus, in a platen press operating at, say, 1200 impressions an hour, the actual hard impressional contact over the entire surface of the form will probably not "dwell" to exceed .08 or .10 second. In a cylinder press, however, working at the same speed, the actual contact instant, assuming the breadth of lines equal, say, to .02 inch, would not exceed .002 second, or a period of time in the platen press of from 40 to 50 times greater duration than in the cylinder; and yet two such printed sheets might not be distinguishable one from the other. Consequently, it may be accepted as a fact that printing ink is nowise absorbed by the paper, but is forcibly driven into its fiber.

In a cylinder press, if the face of the form exactly coincides with the pitch line of the rack of the bed; if the face of the sheet to be printed on the cylinder exactly coincides with the pitch line of the cylinder gear; if the tympan is practically inelastic, and if the design and workmanship of the interacting parts are practically perfect, then the printed sheet may be of the first order. But such an aggregation of conditions are not at all times obtainable, as attested by the fact that types and engravings are more rapidly worn down under cylindrical action than under platen contact. Theoretically perfect rolling contact, as between a type-bed and a cylinder, is demonstrably unattainable; at the same time, the degree of perfection reached by cylinder press makers is remarkable. But this illustration is for the purpose of comparison only, as the field covered by cylinder presses is quite distinct from that of platen machines, and the use of the two are in many cases not interchangeable.

In a platen machine, if the surfaces of both the bed and the platen are practically plane surfaces and parallel to each other; if, with respect to the work to be performed, they are practically rigid; if the movement of one to the other is direct, square and accurate, and if there is adequate impressional power, then the printed sheet may be of the first order; the abrasive action upon the printing surface will be of the slightest possible amount, and the durability of the form will reach its maximum.

To produce a faultlessly printed sheet, at least the following elements must be aggregated: press, ink, paper, form and make-ready; and if each and all of these elements are of the first order, then the result will be the best obtainable in the least time. Should any one of these elements be defective, however, the result will either be reduced quality of product in the same time, or a high grade of product, but in longer time. It is almost, if not precisely, like the ever-occuring problem of power and motion; to obtain one you must give the other.

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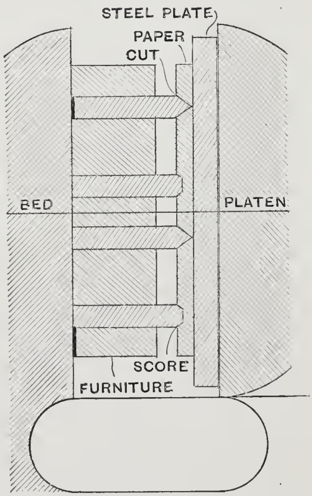
In crank-action presses, the connecting rods and parts attached thereto are restraining members up to the dead center, but become active, driving or transmitting members after the center is passed. That is to say, the parts primarily in tension or compression act like springs to drive the gears, after having passed over the crank center. Hence, if there be any lost motion, it will be taken up with great rapidity; consequently, back-geared crank presses require close fitting, else there will be a sharp hammer-like shock as the crank-pins pass over the nip. In fact, by such shocks, cast-iron gears are frequently broken when the cause is otherwise assigned.

The somewhat remarkable circumstance has repeatedly been observed, that presses used under heavy strain will stand satisfactorily at rapid rates of operation when they fail if operated at a lower rate of speed; and this, notwithstanding that all the conditions in each case are precisely alike, except, only, as stated, the change of speed. We have no good theory to offer in explanation of this fact, but it is a fact beyond all cavil.



So, also, a form of large area, requiring an exceptionally heavy impression, may not cause the immediate failure of the machine, which is much more likely to occur under a lighter impression immediately following the heavier; provided, however, that the lighter impression shall be upon a form of materially less area than the first. Probably the good reason for this is to be found in the change of the distribution of strains.

In presses for cutting and scoring paper box blanks, it has been found that if the knives are permitted to take the impression without feeding the sheets, making a direct impingement upon the cutting plate, the sharp edges are much sooner turned than when, as in regular use, they are first driven through the sheet, and thence are arrested by the face of the steel plate. Whether this is simply due to the greater pressure imposed upon the edges, when the obstruction due to the sheet is missing, or that the edges of the knives are cushioned by particles of fiber carried forward under the edges of the knives, is not definitely settled. But as to the definite practical fact there is no question, even although it waits upon a laggard theory.*

To emboss a sheet of paper generally requires, it is believed, more pressure upon each unit of surface than would a sheet of metal of corresponding thickness; the reason being that metal, if simply indented, would retain the form, while the fiber of paper, being resilient, must be crushed, deformed, "set," before it will take and retain, sharply, the impress of the die. In some instances, too, no amount of mere pressure will alone suffice; heat must be added to pressure, to co-act therewith, and especially is this so in fibers charged with "sizing," such as are used on book-covers.

An embossing press, running at high speed, strained up to all the fly-wheel will carry over, might well be held liable to indictment for inflicting cruelty upon iron and steel; the duty, to say the least of it, is exceedingly severe, much more so than is usually apprehended.

For some years the belief has been entertained that one reason why embossing seems to require, at times, a degree of pressure apparently quite out of proportion to the result obtained, is due to the confinement of air in the cavities of the die; such cells being formed by the paper as it is driven "home," hence, the resilient air acts as a cushion and prevents an absolutely hard contact between the paper and the metal. So far, no adequate remedy has been found for this difficulty. The expedient occasionally employed in drop-forging dies, that is, minute perforations, is not usually applicable in this case.

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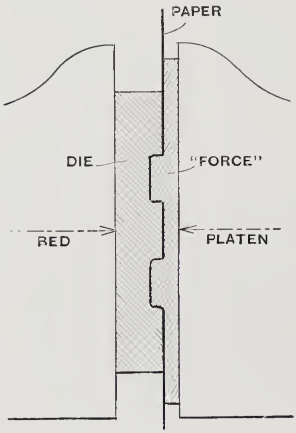
Next in order of importance come presses adapted for embossing. The lighter grades of work may occasionally be executed upon platen printing presses, but even when constructed in the strongest and most rigid manner the usual effect of embossing is to lower more or less the efficiency of the machine as a printing press, the reason for which is, that the hard pounding, the hammer-like shocks, often experienced in embossing result in hollow beds and platens. Moreover, frequently the heaviest impressions are imposed upon dies of small area, thus centralizing the strains upon a small surface. In embossing practice, a heavy die is not necessarily of large dimensions, as its "heaviness" is much more dependent upon the number and character of the lines or points to be brought up in the paper than in the mere upsetting of blank surfaces having greater area.

Another condition of unusual severity to be contended with in embossing is that dies may frequently be set out of proper center. Sometimes this cannot be avoided, but most frequently it is caused by error of judgment in the pressman. The cause of this is that the proper center of a die with respect to the platen may not be its lineal center. What is here meant by the term "proper center" is the center of pressure, to determine which, in regular practice, is largely a matter of

* "It is easy to laugh at and deride shop prejudices, and there are enough of them that deserve ridicule; again, there are some that will not down, and they compel the scientist to hunt for explanations. But after all, ridicule is dangerous; it is possible that a careful comparison of some of the laws laid down by the highest scientists would tend to excite the risibles. If the hand worker sometimes flounders in the mud, the scientist is sometimes enveloped and groping in mist."
WILLIAM METCALF, C. E., Past President American Society of Civil Engineers.

experience and judgment. Thus, to cite a simple example, if a die 6 inches wide by 12 inches long has twice the amount of line work in 6 inches of its length than it has in the other, then this end will require twice as much pressure as the other; hence, to balance the strain upon the press, upon this basis of 2 : 1, assumed either as of pressure or of leverage, the transverse center of such a die should be 4 inches from the end of its heavy surface.

Still another reason why paper embossing involves very heavy pressure is that but one die is used; a fact, by the way, which is not infrequently unknown even by printers of experience. Thus, the real die, which is usually cut in steel or brass and occasionally etched in zinc, is a sunken figure, an intaglio, while that which would correspond to the "male" die is termed a "force" or "counter," and this is invariably built up artificially, as will be understood by reference to the diagram. In the construction of "forces" many substances are used, such as paper, with marine or fish glue, waxes of various kinds, cements, shellac, clays, gutta-percha, fibers, hard rubber and the like. But it can be accepted as a principle that some kind of resilient substance is essential; for, even if it were practicable to produce a perfect metal "counter" (and this has been tried by electrical deposition), it would fail, because it is improbable that any machine can be built so rigid, under strain, but that it would act to cut the sheet. In this character of "make-ready" much depends upon the skill of the pressman; one man will produce a satisfactory result with 20 tons of pressure where another man would hardly do more than indent the paper with 100 tons. The nub of the whole matter is to get the pressure into the recesses of the die.



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Here is a simple rule to avoid accidental breakage in machinery. Make it a hard and fast practice to have your machinery examined at stated times, and particularly observe that all stud-bolts, screws and nuts are tight and performing proper duty. Insist upon the carrying out of this simple system, and you will find that those accidents which are reported as if an effect without a cause, "broke itself, not a thing touched it," will cease; for if it had been "touched" at the proper time, there would have been no cause for accident. The economics of railroading compels such inspection of cars and locomotives. Then it has been proved, times over, that it pays to keep machinery bright and clean, and while this is particularly applicable to a printing press, it is good practice, now and then, even in a stone crusher.

An elementary word in regard to oil may bear repeating here. The function of oil on machinery is to prevent the contact of metallic surfaces. It acts like a system of rollers. To perform proper duty, it should have sufficient tenacity not to crush; it should be sufficiently limpid to reach the surfaces of well-fitted journals and yet not "run away;" and it should not change its quality by exposure to the air or from contact from metals. Animal oils are liable to corrode; vegetable oils to "gum up." The writer does not hesitate to recommend the modern mineral oils, without doctoring or compounding in any way, as the best for regular practice, at least in the character of machinery herein referred to. If some one could devise a thumb-and-finger rule for determining the approximate quality of oil, and then promulgate it, there would result at once a distinct advance in moral ethics; for the patience of the patriarch of the land of Uz would give out under the complaint of "soft metal" when it is found that bearings subjected to tons of pressure to the square inch are being lubricated with oil proper only for a sewing machine or a clock.

Respecting the application of oil, it is better practice to apply frequently and sparingly rather than at long intervals to flood your bearings. All bearings subject to heavy strain should be frequently wiped, if open, or washed out with benzine, if closed, else the fine particles of metal which become separated, mix with the lubricant and thus form a grinding paste. And especially is this so in the first starting up of a new machine, in which there is sure to be a residuum of fine dust, filings and grit that no amount of original wiping or brushing will fully remove. Now, if this is carefully removed as rapidly as it accumulates, then the effect of the initial wear is highly beneficial, the bearings soon taking on a burnished polish, the endurance of which is of the first order.

In all closed cams, that is, in which a closely fitted roller works in a groove, oil should be sparingly applied, especially so if the oil is of heavy body, the reason for this being that the oil may act to prevent the roller from turning upon its journal.

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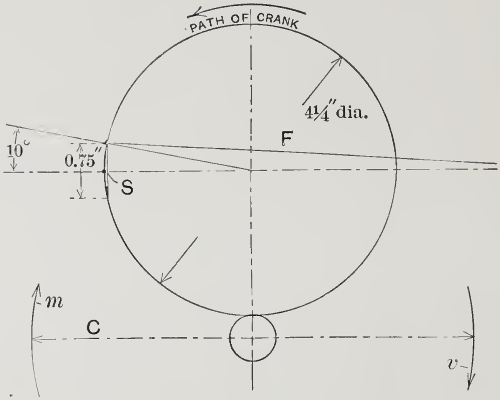
The query is often asked: What pressure will this or that machine give? Such questions cannot be definitely answered, it is believed, at the present time. Several years ago the writer constructed a hydraulic ram adapted to a printing press to be acted upon by the platen, its relation being 50 : 1 of a 10,000-pound Bourdon spring gauge, alleged to have been carefully constructed for the purpose, and intended to give a maximum indication of 500,000 pounds. But the shocks soon gave evidence that the gauge tube was playing the too usual part of such instruments, and this, together with business complications, which came up at the time, put a stop to the proposed extended series of experiments. Nevertheless, enough was ascertained by the considerable number of experiments carried out to indicate a "handy" empirical method of approximating the measure of kinetic energy, in terms of foot-pounds, which the fly-wheel of a press would be capable of exerting upon the platen, the sole object of this being to form a premise upon which to determine the dimensions of the working parts. The indications of the experiments referred to were that the coefficient of friction, under heavy strains, was materially higher and more variable than had been expected; hence it appeared that any expression as to its value, short of absolute determination, under actual working conditions, would be little better than guesswork. The scheme was then adopted to disregard entirely the consideration of friction and simply let it stand as the factor of safety. Briefly, then, the whole matter boiled down to this: The pressure deliverable at the platen in foot-pounds (F) would be equal to half the weight of the rim of the fly-wheel in pounds ($\frac{1}{2}M$) times the square of the velocity (v^2) in feet per second at the center of its gyration divided by the impression movement of the platen in parts of a foot, the latter most readily obtainable by finding the versed sine (S) of the crank during the angle of its impression action $\left(F = \frac{\frac{1}{2}MV^2}{S}\right)$. Thus, if it were shown that the theoretical strain which might be imposed upon the connections were up to about the tensile limit of the material, then the power absorbed in friction, be it 25, 35, 50 per cent. (any of which guesses might be good), would be the factor on the side of safety.



EXAMPLE: F = foot-pounds on connecting rods. S, versed sine, = .00275 feet. M, fly-wheel, = 250 pounds. C, center of gyration of fly-wheel, = 6.28 feet circumference. V, velocity of fly-wheel, = 17.8 feet a second. Relation of fly-wheel to crank = 8.5 : 1. Time of revolution of crank = 3 seconds. Cross section of connecting rods and pins = 20 square inches. $\left(F = \frac{\frac{1}{2} M V^2}{S}\right)$ Thus, $125 \times 17.8^2 = 1{,}440{,}181$ foot-pounds, or 720 tons, if no friction, and if fly-wheel were brought to rest during the 10° traverse of crank. (=.083 second).

But assume belt capable of restoring but half of full velocity, then $\frac{360}{20 \text{ square inches}} = 18$ second foot-tons to each square inch of section; which is probably the greatest maximum load possible in practice and with no deduction yet made for friction.

The diagram is a reduplication of the dimensions, process and figures upon which the 12½ x 18½-inch embossing press was designed, and the other machines herein shown were also predicated upon this theory. All the writer will say for this formula is that the presses built under its wing have most worthily stood up to their duty. His judgment is that it is well within the line of safety, in the character of machines here shown, as in at least two instances fly-wheels were subsequently increased in weight over that called for by the rule, again indicating a very high coefficient of friction under strain. Whether there is any novelty in this direct transfer from the rim of the fly-wheel to the versed sine of the crank, he does not know, nor does he much care, as, like many such expressions, it is largely an intellectual satisfaction, liable to be practically misleading. He hopes, at no far distant time, to take the subject up under the only proper method, if it can be satisfactorily worked out, as he confidently believes it can, namely, to make the measurement of the pressures in actual pounds of weight at the apex, the instant of greatest effort.

The strongest incentive to advancement is to learn of the achievement made by others, and next to this is the faith of those with whom you have to treat; for it not only requires skill and experience, but patience, faith and money as well, to make a commercial success of any machine which is expensive to construct as compared to its competitors. Intention is, of course, a useful factor; but this is not all. You must first know what to do; next, how to do it, and then do it. We should all bear in mind that an incorrect principle will outlive the best steel that was ever forged. And then, too, the "little things" are so often of the most vital importance, because far reaching in their consequences. It is the obscure detail, unrecognized or passed by as of no consequence, which most often stands as the dividing line between that which shall be successful and enduring, or

Painted by Prof C Schussele *Engraved by John Sartain*

THE IRON WORKER AND KING SOLOMON

This half-tone was executed upon the type of press illustrated on page 6. In producing this illustration two impressions were taken from the *same* plate, black ink being run on the first impression and transparent brown on the second. Reproduced by Bartlett & Company from artist's proof, by special permission of the owner of the copyright, to accompany paper on "Platen Presses," presented to the American Society of Civil Engineers, by John Thomson, Member of the Society.

unsuccessful and short-lived. It was the great anatomist, sculptor, architect, painter, Michael Angelo, who said, "Trifles make perfection."

*   *   *   *   *   *   *   *   *

It is hoped that the engraving here presented, "The Iron-worker and King Solomon," will not be regarded as out of place, as it is intended to indicate the most advanced accomplishment in photographic "process" work and also in letter-press printing. The subject is not only happily chosen, we believe, but every detail, mechanically and artistically, is faultless. Results like this might possibly cause an improper degree of exultation upon the part of the modest press-maker, were it not for the restraining claims of the ink-maker, the paper-maker, the photographer, the artist and the pressman, each and all of whom are entitled to share in the credit. Nevertheless, may he not properly take unto himself the claim, that without the printing press there would have been no Art Preservative of Arts; nay, more, that without the engineer there would have been no printing machine? Verily, we have eminent authority for this assumption, for the wisest man, when time was young, proclaimed it in express words: "Ho, there," commanded Solomon, "make place at my right hand; the claim is justly made; but for the iron-worker (the engineer) I would have had no temple!"*

*EXTRACTS FROM THE LEGEND OF KING SOLOMON AND THE IRON WORKER.

And when Solomon and his guests had arrived at the place of the feast, they beheld a man, clad in the garb and covered with the soil of labor, seated in the chair of honor not yet awarded. And the king waxed wroth, and said, "What manner of man art thou? Why comest thou thus unseemly and unbidden to our feast, where none are invited save the chief workers on the Temple?"

And the man answered and said, "Please you, I came not unbidden. Was it not proclaimed that this day the chief workmen of the Temple dine with the king? Therefore am I come."

And when the man had thus spoken, the guests talked with each other, and he who carved the cherubim spake aloud and said, "This fellow is no sculptor. I know him not."

And he who inlaid the roof with pure gold said, "Neither is he of those who work in refined metals."

And he who wrought in raising the walls said, "He belongs not with those who are cutters of stone."

And one who labored in shaping the timbers for the roof said, "We who are cunning in cedar wood, and know the mystery of joining strange timbers together, know him not. He is not of us."

Then said King Solomon, "How sayest thou now? Wherefore should I not have thee plucked by the beard, scourged with a scourge and stoned with stones, even unto death?"

But the man was nowise daunted, and he rose from the seat, and came to where the wine was set, and took a cup of the wine and raised it high and spake aloud, saying, "O king! live forever!" He then drank long until the cup was emptied.

He now returned to the seat and spake to the guests who had rebuked him, and said unto the chief of the carvers in stone, "Who made the instruments with which you carve?"

And he answered, "The Blacksmith."

And to the chief of the workers in wood he said, "Who made the tools with which you felled the cedars of Lebanon, and shaped them into pillars and roof for the Temple?"

And he also answered, "The Blacksmith."

Then he spoke unto the artificer in gold and ivory and precious stones, saying, "Who fashioned the instruments with which you wrought beautiful ornaments for my lord the king?"

And he too made answer the same, "The Blacksmith."

Then said the man to Solomon, "Behold, O king! *I* am he who when men deride, they call me Blacksmith, but when they would honor me, they call me Son of the Forge. These craftsmen say truly that I am not of them: I am their superior. Without *my* labor first, *their* labor could not be."

"Son of the Forge," said Solomon, "I too honor thee, thou worthy successor of the great master, Tubal Cain. Take thou this seat at my right hand prepared for the *most* worthy. It is thy due."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HALF-TONE ILLUSTRATIONS OF PRESSES

SAMPLES OF PRESS-WORK CONTAINED IN THIS CATALOGUE EXECUTED UPON "COLT'S ARMORY" PRESSES OWNED AND USED FOR YEARS BY BARTLETT & COMPANY, "THE ORR PRESS"

COVER, exhibiting Tint Printing and Embossing, requiring exceedingly close register in the tint plate and a very heavy impression to bring up the fine line-work of the die. This was executed upon the presses shown on pages 6, 28 and 29, and was run off at the rate of about 1500 impressions an hour.

CHROMOTYPE, "The Mantilla," in three colors, between pages 62 and 63. Printed upon the press illustrated on page 12. This exhibits extreme delicacy of registration, of ink-deposition and of distribution, at fast operation.

HALF-TONE, "The Iron Worker and King Solomon," denoting the regular grade of "Colt's Armory" distribution, and square, sharp impression at fast speed, shown between pages 68 and 69. Printed upon the type of press illustrated on page 6.