

No. 632,766.

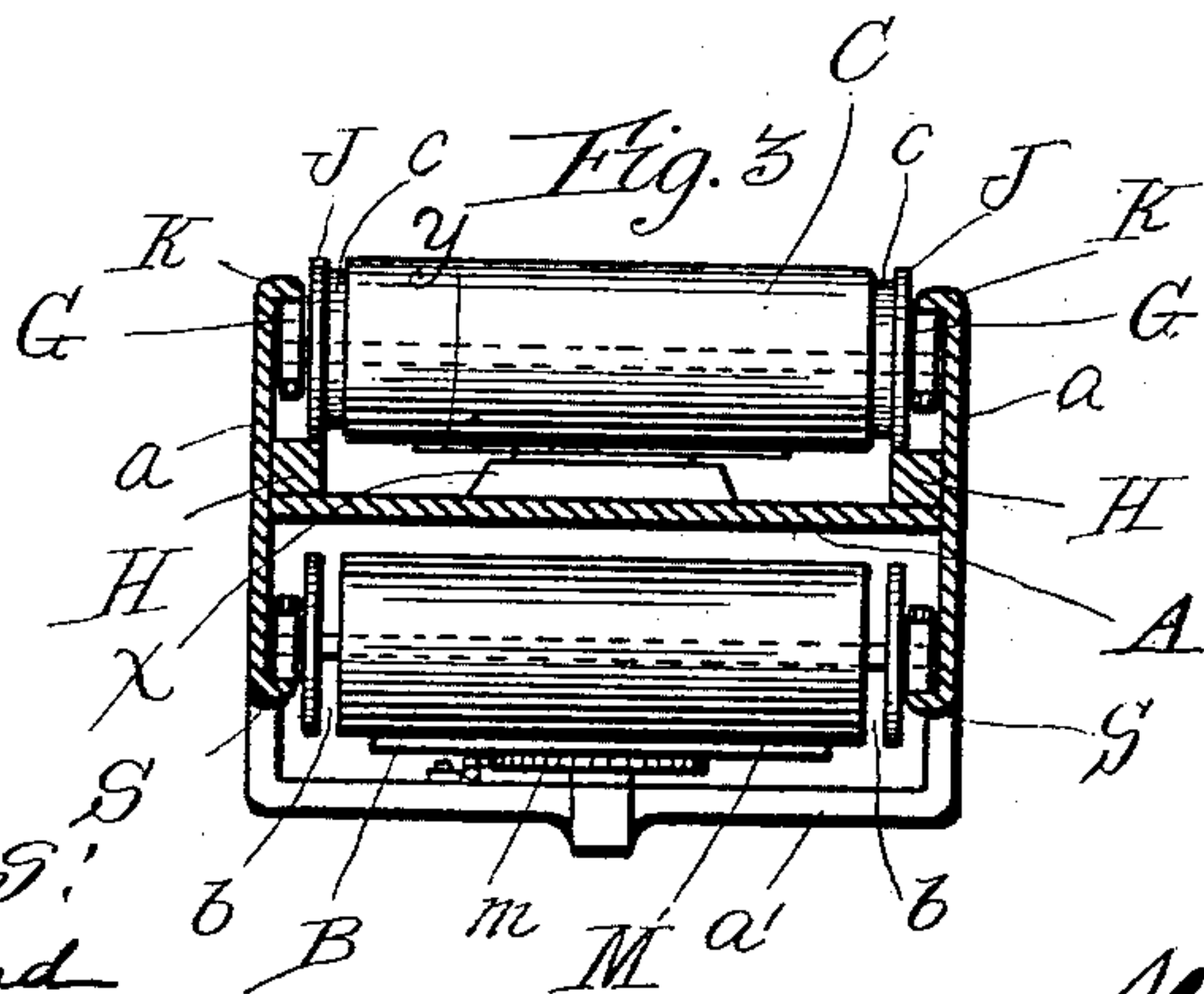
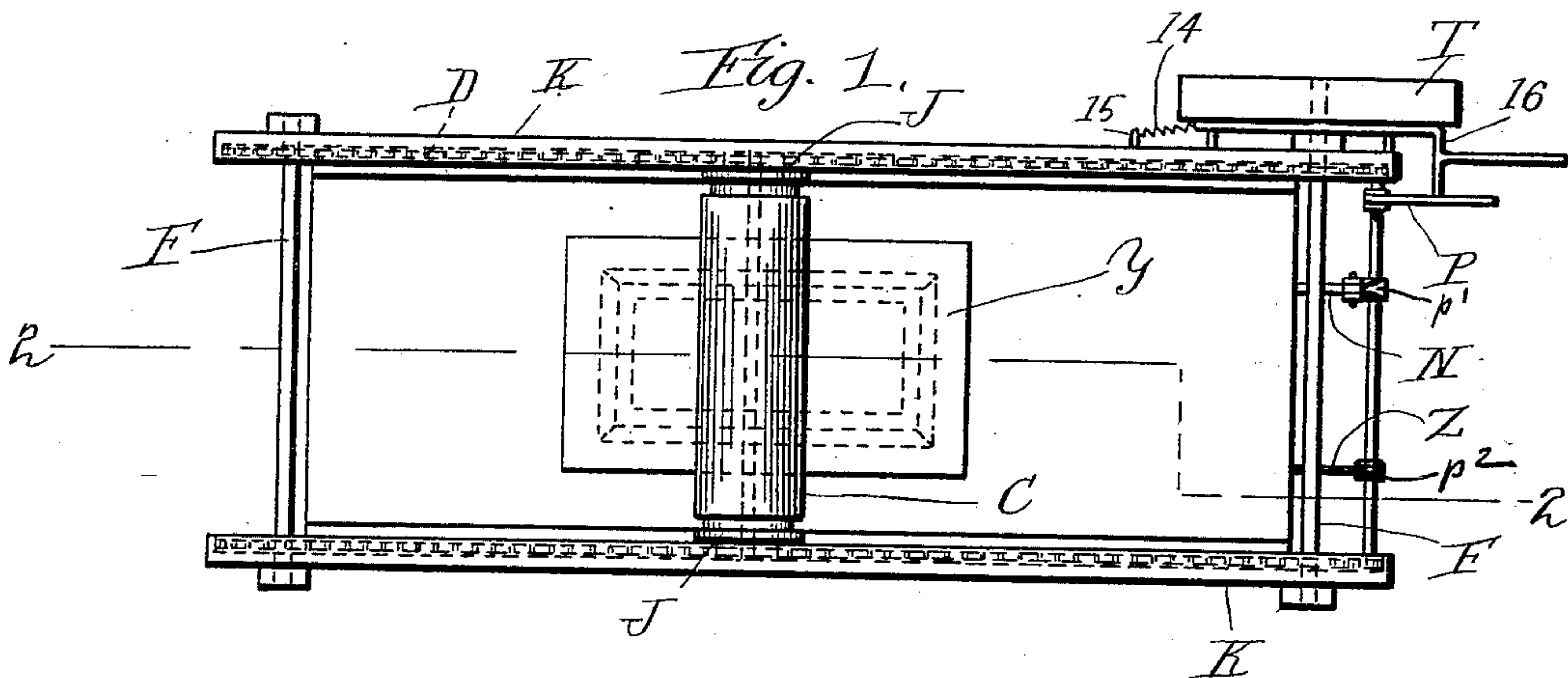
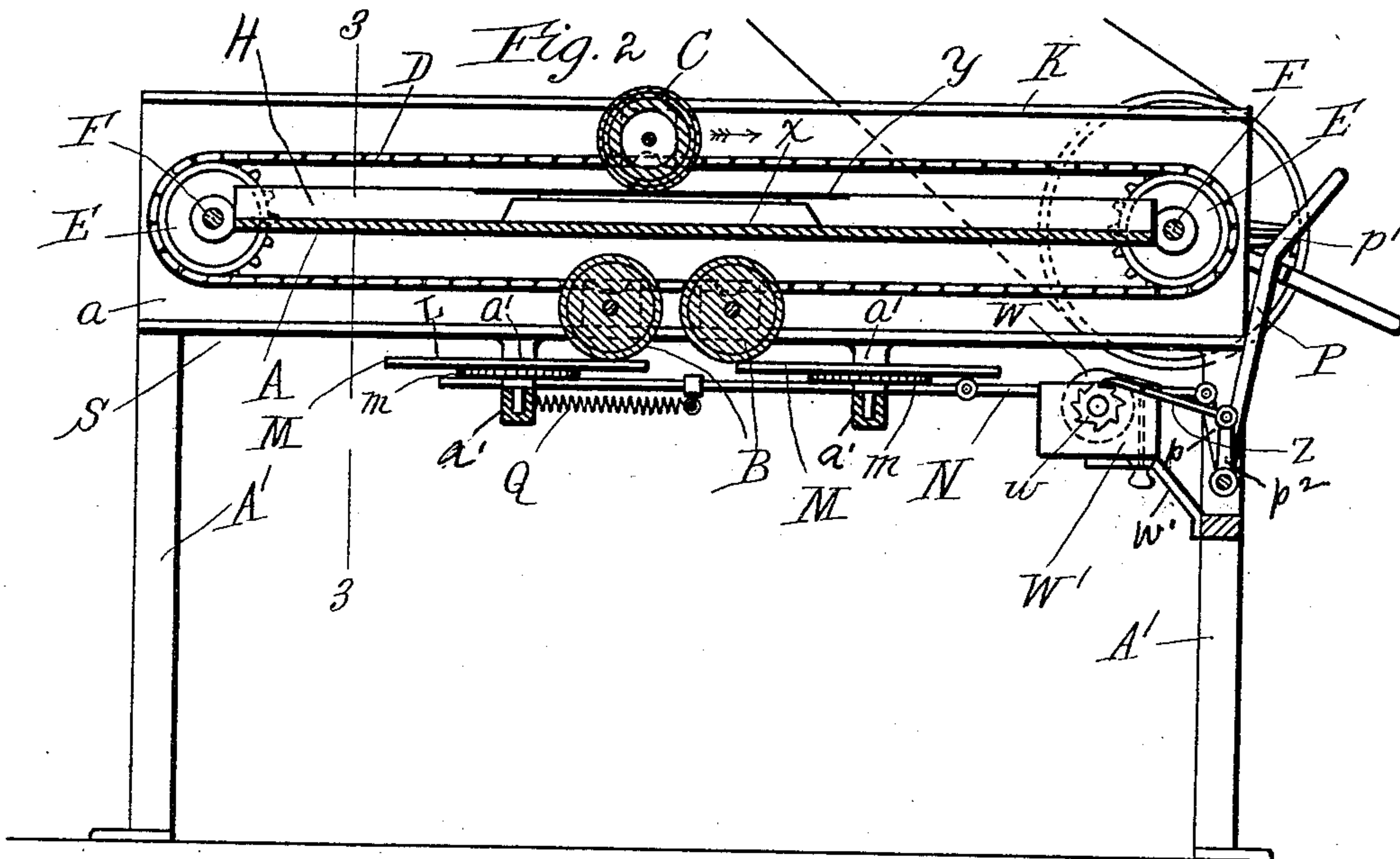
Patented Sept. 12, 1899.

A. R. STONE.
PRINTING PRESS.

(Application filed Nov. 19, 1898.)

(No Model.)

2 Sheets—Sheet 1.



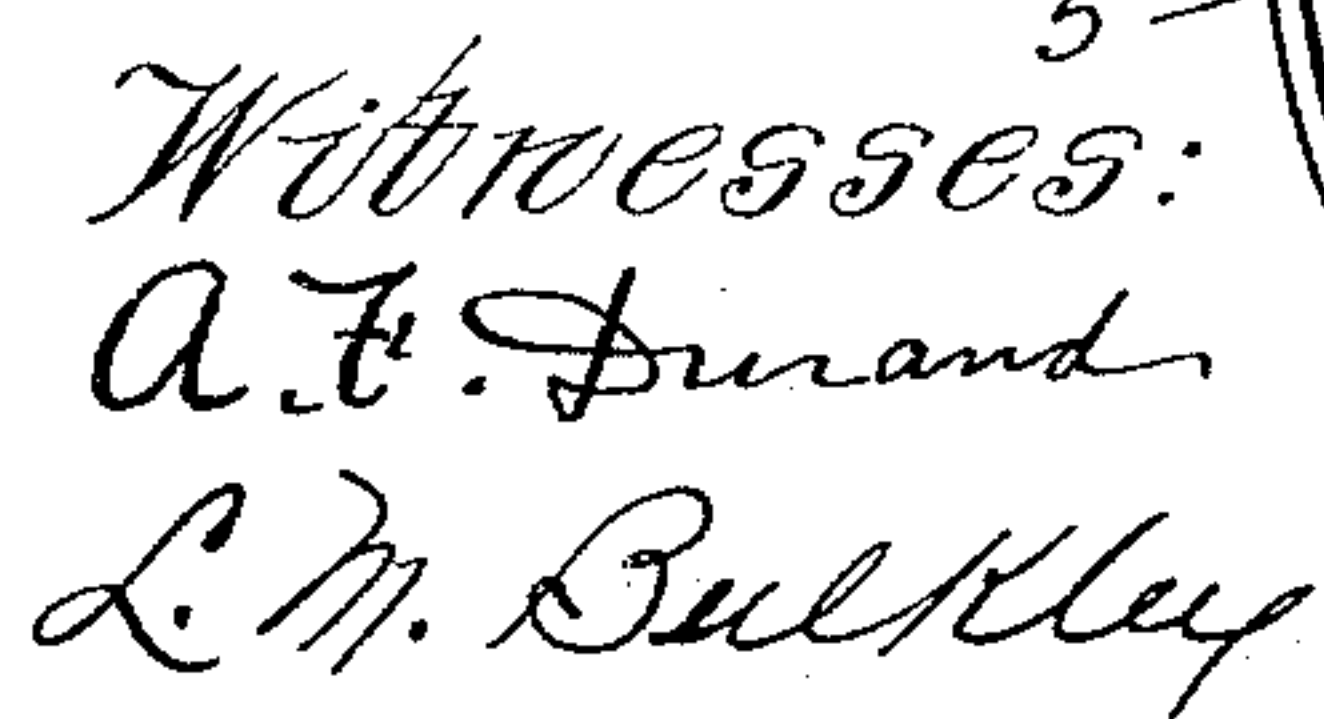
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Patented Sept. 12, 1899.

(Application filed Nov. 19, 1898.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

ALLISON R. STONE, OF CHICAGO, ILLINOIS.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 632,766, dated September 12, 1899.

Application filed November 19, 1898. Serial No. 696,844. (No model.)

To all whom it may concern:

Be it known that I, ALLISON R. STONE, a citizen of the United States of America, and a resident of Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Printing-Presses, of which the following is a specification.

My invention relates in general to printing or like presses, and in particular to a construction or arrangement thereof especially adapted for use in taking proofs.

Prominent objects of my invention are to provide a practical, cheap, and durable construction or arrangement of printing or like press, to simplify the construction and operation of the same as much as possible, to dispense with complicated and intricate mechanism for alternately inking the form and taking the impression or copy therefrom, to arrange for a satisfactory and efficient continuous supply of ink for inking the forms, to arrange for the automatic stoppage of the press after the taking of each copy, if desired, and to provide other novel features tending to increase the efficiency and utility of these presses.

To the attainment of the foregoing and other desirable ends my invention consists in matters hereinafter set forth.

In the accompanying drawings, Figure 1 is a plan of a printing or like press embodying my invention. Fig. 2 is a longitudinal vertical section of the same, taken on line 2 2, Fig. 1. Fig. 3 is a transverse vertical section of the upper part of the press, taken on line 3 3 of Fig. 2. Fig. 4 is a view, partly in plan and partly in horizontal section, of the inking device. Fig. 5 is a modification of such device. Fig. 6 is an enlarged view of a detail of construction. Fig. 7 is a vertical section of a portion of a modified form of another detail of construction, also on a larger scale. Fig. 8 is an enlarged elevation of the device for automatically stopping the press after the taking of each copy; and Fig. 9 is a view of such device, partly in vertical section and partly in elevation and on a still larger scale.

In the accompanying drawings I have shown the preferred embodiment of my invention; but I consider that in its broader features it can be embodied in other types or forms of machines, and so do not desire to be

understood as limiting myself to the exact type or form of machine herein shown or to the specific devices which I employ therein. 55

In this machine the form X, from which the copy, either in the shape of a proof or of a copy for use, is to be taken, is arranged in position upon a horizontal bed or table A, which forms a support or holder for it. This bed or table A is suitably supported between side uprights or frame-pieces *a a*, which are in turn supported by legs *A' A'* and are connected together, so as to form a machine-frame-work, by connecting bars or rods *a' a'*. When so arranged upon the bed or table A, the form is first inked by a suitable inking device or devices, such as the inking-rollers B B; then the paper Y, upon which the copy is to be made, is placed over the form either by hand or otherwise, then the paper is pressed against the form by a suitable impression device, such as the impression-roller C, so as to make the proper copy upon it, and finally the paper is lifted from the form with an impression thereof upon it. 60 65 70 75

In accordance with my invention the inking devices, such as the rolls B B, and the impression device, such as the roll C, are successively drawn in proper order over the form X, so as to first ink the form and then make the impression upon the table, and they are then returned by a different way or path of travel instead of being returned over the same route on which they were advanced. In this way they are not returned so closely above the form as to necessitate lifting the inking and impression device in order to avoid the same, and consequently I dispense with all intricate and complicated mechanism for that purpose. As a simple, practical, and preferred embodiment of this principle I draw the inking-rollers B B and the impression-roller C successively and in the proper order over the form X by an endless carrier, such as a couple of sprocket-chains D D. In such case I arrange the sprocket-chains to travel over a couple of pairs of sprocket-wheels E E, carried by shafts desirably mounted in the side uprights *a' a'* at opposite ends of the bed or table A. By such arrangement the inking-rollers B B and compression-roller C after passing over the form return below the bed or table A. The inking and impression roll- 80 85 90 95 100

ers B B and C can be attached to the sprocket-chains D by any suitable devices which will allow the travel of the chains about the sprocket-wheels E E. As a simple arrangement and as a matter of further and specific improvement I attach them by means of the devices shown in the drawings. These devices involve suitable bearings or journals G G, in which the roller-spindles can be mounted. The lower side portions of each of these bearings or journals G G extend downwardly, so as to embrace the opposite sides of the portion of the chain to which it is to be attached. These downwardly-extending side portions are each provided with apertures g , in which the projected ends of one of the joining spindles or pins of the sprocket-chain can be confined, and they are also provided with slots g' , in which a second spindle, similarly projecting from another joint in the sprocket-chain, can be confined. In this way the sprocket-chain pin or spindle confined in the slots g' can have suitable play to permit the chain to travel about the sprocket-wheels E E in an easy manner and without binding. The spindles of the rollers B B and C are preferably mounted in these bearings or journals through the medium of an eccentric g^2 , which can be suitably turned so as to properly adjust the respective rollers and which when so turned can be held in proper position by an adjusting-screw g^3 .

I desirably arrange at the opposite sides of the bed or table A suitable tracks H H, upon which can travel suitable wheels J J on the opposite ends of the rollers B B and C. The height of these tracks H H is such as to allow the inking and impression rollers to travel over the bed or table A at such a distance above it as to rest properly upon the form X when passing over it. In this way the impression-roller is turned during its advancement over the bed or table and so does not strike the form in a stationary condition, and thereby tend to drag the paper over it; but it rolls smoothly and evenly over the paper without any tendency to displace the same.

In order to prevent the impression-roller C from being unduly lifted in passing over the form X and so to insure the making of an impression therefrom, I desirably arrange above the tracks H H suitably downward-facing guides K K, which are so positioned as to allow the bearings or journals G G to pass readily below them. In this way the impression-roller is confined so as to substantially prevent any extent of vertical movement when passing over the bed or table A. The guides K K are conveniently provided by forming flanges at the upper edge of the side uprights a .

As a matter of further improvement I arrange the devices for the inking-rollers B B below the bed or table A, in which way they are confined in a space which otherwise would not be utilized, while at the same time they are protected from dust and injury. While

any inking device can be employed for this purpose, I desirably employ an inking-surface L, over which the inking-rollers can roll in returning below the bed or table A and with which they can make contact, so as to procure ink from it. In Figs. 2 and 4 I have shown this inking-surface provided by a couple of horizontally-arranged circular inking plates or disks M M, and this is the arrangement I prefer to use. When so employed, the plates or disks are desirably intermittently rotated, so as to secure an even distribution of the ink upon them and to such end are mounted for rotation in suitable bearings or journals provided in the cross frame-pieces $a' a'$. When thus mounted, they are intermittently rotated by a couple of reciprocating pawls $n n$, which are adapted and arranged to engage ratchet-wheels $m m$ below the circular disks M M, so as to turn the latter. The pawls $n n$ are reciprocated by a reciprocating rod or link N, to which they are pivotally connected. This reciprocating rod N slides upon the frame-pieces $a' a'$ and is guided in its reciprocation by suitable guide-ways $n^2 n^2$, which work upon pins $n^3 n^3$, formed on said cross-pieces $a' a'$. The rod N is drawn rearwardly by the arm p of the bell-crank lever P, to which it is pivotally connected, and is drawn forwardly by the tension-spring Q, which has its rear end attached to the rod N and its forward end attached to the forward cross-piece a' . The bell-crank lever P is moved rearwardly by the impression-roller C when the latter is drawn about the rear sprocket-wheels E E by a band portion c of said roller striking against the upwardly and rearwardly inclined arm p' of said bell-crank lever P. It thereby draws the pawls $n n$ past one of the teeth on the ratchet-wheels $m m$. Upon its release by the forward movement of the impression-roller C, after the latter has passed about the rear sprocket-wheels E E, the bell-crank lever P is drawn forwardly by the spring Q in a way to cause the pawls $n n$ to turn the ratchet-wheels a distance of one tooth, and thereby turn the circular inking-plates M a corresponding portion of a revolution. The inking-rollers B B are constructed with a recess b at their ends in alinement with the lever-arm p' of the bell-crank lever P, in which way they fail to strike against and operate said bell-crank lever in their passage about the rear end of the bed or table A. As a result it will be seen that for each passage of the inking-rollers over the inking-disks M M the latter are turned a portion of a revolution. It will also be seen that this movement of the inking disks or plates occurs at a time when the inking-rollers are free and are receding from them, it being observed that at the time the impression-roller C is moving downwardly about the rear end of the bed or table A the inking-rollers B B are moving upwardly about the forward end of the same.

As an alternative arrangement of inking device I have shown in Fig. 5 a rectangular

inking-platen M' , mounted for transverse movement upon a couple of slideways $R R$. This ink-platen M' can be shifted backward and forward transversely by a link connection r with a wheel r^2 , having a ratchet-wheel m , which can be actuated by a pawl n on a reciprocating rod N in the manner heretofore set forth with reference to the mechanism shown in Figs. 2 and 4. As an arrangement for automatically supplying ink continuously to the inking-surface L , whether the latter is provided by the circular disks $M M$ or the laterally-shifting platen M' , I have shown an ink-fountain comprising an ink-supply wheel or roller W supported in bearings formed at the end of an ink-box W' in such a way that the lower portion of the roller W is continually submerged in the ink which, it is understood, the box contains. The roller W is arranged in such position that its upper surface is substantially in alinement with the inking-surface L , in which way the inking-rollers $B B$ come in contact with it and receive ink from it in passing to such inking-surface L . The box W' is conveniently supported on a shelf $w' w'$, which is in turn supported by a bracket attached to the legs A' . This ink-supply wheel W is desirably intermittently rotated at each revolution of the inking-wheels $B B$ by a pawl Z , Fig. 1, which is pivotally connected with a rocker-arm p^2 on the rock-shaft carrying the bell-crank lever P and which acts against a ratchet-wheel w , with which the roller W is provided.

I desirably provide below the bed or table A a couple of tracks $S S$, upon which the bearings or journals $G G$ of the rollers can travel. These tracks $S S$ are conveniently provided by flanges formed on lower edges of the frame-uprights $a a$.

The journals $G G$ of the inking-rollers $B B$ are of such a size as to allow these rollers to rest upon the inking-surface L during their return below the bed or table A ; but in order to prevent the impression-roller C from resting upon this inking-surface and so becoming undesirably coated with ink the journals $G G$ of this roller are made larger, so that the impression-roller in its return passage is lifted a slight distance above the inking-surface.

The impression-roller C can be of any suitable construction; but as a matter of preferred arrangement it is constructed with an outer cylinder c' of hard material and an inner cylinder c^2 of soft spongy material. By this construction it will make a satisfactory and clear impression upon the paper and at the same time will accommodate itself to such slight variations in height as may occur in different forms. In order, however, to additionally or alternately provide for variations in the height of forms, I can make the upper guides $K K$ vertically adjustable and subject them to downward tension, as shown in Fig. 7. In this figure I have shown side uprights $a a$ extended upward more than in the pre-

viously-described construction and the guides $K K$ suspended from flanges on the upper edges of these side uprights $a a$ by bolts $a^5 a^5$ and normally pressed downward by springs V , which are confined between the said flanges and the guides. By such arrangement the impression-roller is normally pressed downward, so as to always rest upon the forms irrespective of their heights, it being understood that the tracks $H H$, upon which the rollers run, are of such a height as to allow the roller to come in contact with the lowest form used.

It will be understood that although I have shown but two inking-rollers $B B$, I can employ any suitable number, either greater or less than the number shown.

The press could be suitably driven either by hand or by a power connection, such as the belt shown traveling over a pulley T on the rear-sprocket shaft F . In the latter case the pulley T can be made rigid with the shaft, so as to drive the press continuously as long as the belt runs. As a preferred arrangement, however, the pulley T is mounted loosely on its shaft and is associated with a clutch device by which the press can be either allowed to run continuously or be automatically stopped after the making of each copy. While any suitable clutch device can be employed for this purpose, I have shown herein a device which is particularly well adapted for use in connection with a press of this kind and which I consider a matter of further and specific improvement. In this device, which is shown in connection with the press in Figs. 1 and 2 and alone in detail in Figs. 8 and 9, I secure a couple of arms $2 2$ rigidly to the shaft F , upon which the pulley T is loosely mounted, so that they are continuously rotated by it. Each of these rotating arms $2 2$ carries a reciprocating rod or link 3 , which is loosely mounted in a suitable guide or holder 4 , formed at the end of the arm 2 , carrying it. This mounting allows the rods or links $3 3$ to slide readily back and forth relatively to the arms $2 2$ in a general radial direction and also to swing slightly from side to side about their points of connection with the arms. The outer ends of these rods or links are provided with friction-shoes $5 5$, which when the rods or links are moved outward press against the interior of the rim of the pulley T , and thereby cause the latter to rotate the arms $2 2$ and the shaft carrying the same. The inner ends of the rods or links $3 3$ are bent laterally, so as to form pins $6 6$. The latter are engaged by a friction-wheel 7 , which is mounted loosely on the shaft F . By the rotative movement of this wheel 7 relatively to the arms $2 2$ in one direction the rods $3 3$ are projected outwardly to an extent to cause the friction-shoes $5 5$ thereon to engage the pulley T , while by its rotative movement in the opposite direction the rods are retracted so as to

cause the withdrawal of the friction-shoes from the pulley. The arms 2 2 and the loose friction-wheel are engaged by retractile springs 8 8, which hold the friction-wheel 7 normally in the position by which the rods 3 3 are projected outwardly, so as to cause the friction-shoes 5 5 thereon to engage the pulley T. In this way the friction-shoes 5 5 are held normally against the pulley-rim, so that the pulley 7 normally rotates the shaft F, and thereby normally continuously operates the press. Obviously the retardation of the friction-wheel 7 would cause the rotation of the same relatively to the arms 2 2 and would thereby cause the retraction of the rods 2 2, the withdrawal of the friction-shoes 5 5 from the pulley-rim, and the consequent stoppage of the machine. The device I have shown for thus retarding the rotation of the friction-wheel 7 consists of a friction-block 9, which can be reciprocated into and out of contact with the rim of said wheel 7. The rim of the wheel 7 is desirably grooved and the block 9 correspondingly beveled. The block 9 is conveniently reciprocated by a reciprocating link 10, to which it is secured. The link 10 is guided by pins 11 11, which project from the side *a* on the machine-frame and work in slots 13 13 formed in the link. The latter is normally held in position to retain the friction-block 9 out of contact with the friction-wheel 7 by a retractile spring 14, whose forward end is attached to a pin 15 on the machine-frame and whose rear end is attached to the forward end of the link 10. As a simple and convenient arrangement, the link 10 is drawn rearwardly, so as to bring its friction-block 9 into contact with the friction-wheel 7 by the bell-crank lever P, in which way the press is stopped with the impression and inking rollers at opposite ends of the bed or table A. To such end the rear end 16 of the link 10 is bent inwardly, as best shown in Figs. 1 and 9, so as to be engaged by the arm *p'* of said bell-crank P, when the latter is moved rearwardly to shift the inking plate or plates and operate the ink-fountain.

The rear portion of the link 10 is capable of being moved laterally to an extent to permit of its bent end 16 being brought into position either to be struck and engaged by the bell-crank lever-arm *p'* or to allow said arm to pass the end of said portion 16 without striking. An expansive spring 17, Fig. 9, forces the rear portion of the link 10 normally into position to be struck by the bell-crank arm *p'* and to be moved thereby so as to bring the friction-block 9 into contact with the friction-wheel 7 every time the impression-roller passes around the rear end of the table. By simply pressing the rear end of the link 10 outwardly against the spring 17, either by grasping its handle 20 with the hand or by some suitable device, the bent end 16 thereof is moved so as to prevent the bell-crank arm *p'* from striking it. Obviously by such arrangement the

press will normally be stopped after the taking of each impression, but it can be allowed to run continuously by simply pushing the rear portion of the link 10 outward.

It will be seen that by my invention I secure a practical and simple press capable of being constructed at a very low cost, of being operated in an effective and satisfactory manner, and of being easily handled by persons unskilled in the use of machinery. It will be further seen that this press is particularly well adapted for use as a proof-press in that it allows the forms to be easily and quickly introduced and removed, and also allows paper of any form or size to be employed without inconvenience or delay.

What I claim as my invention is—

1. In a press, the combination of a bed or table upon which the form can be arranged; a couple of flexible endless carriers arranged to travel along the sides of the bed or table, and provided with inking and impression rollers; wheels for the endless carriers, mounted at the ends of the bed or table; tracks upon which the said rollers can roll while passing over the bed or table; an inking-surface arranged below the bed or table; guides associated with the bed or table, and tracks associated with the inking-surfaces; and bearings or journals for the inking and impression rolls, said bearings or journals having connections with the endless carriers adapted to permit the latter to travel about their carrying-wheels, and the impression-roller bearing-journal being constructed so as to engage the guides associated with the bed or table in a way to prevent the impression-roller from rising in passing over the form, and also so as to engage the tracks associated with the inking-surface and thereby prevent said roller from making contact with the latter, and the inking-roller bearings or journals being constructed so as to allow the inking-rollers to travel upon the inking-surface.

2. In a press, the combination with the bed or table, the shiftable inking-surface, and mechanism for shifting the same, of the endless carrier carrying inking and impression devices, one of which is adapted to actuate the inking-surface-shifting mechanism, while the other or others is or are not so adapted.

3. In a press, the combination with the bed or table, a swinging lever, and mechanism operated by said lever, of the endless carrier carrying inking and impression rollers, whereof the impression-roller is constructed so as to strike said lever and thereby automatically actuate said mechanism, while the inking-rollers are constructed with grooves or recesses which permit them to pass the lever without actuating it.

4. In a press, the combination with the bed or table, the endless carrier provided with inking and impression devices, wheels for said carrier, and with means for stopping the

press, of a device carried by the endless carrier and adapted to automatically actuate the stopping mechanism.

5. A press comprising a bed or table upon which the form can be arranged; sprocket-wheels mounted at the opposite ends of the bed or table; sprocket-chains carried by said sprocket-wheels and arranged to advance over the bed or table and to return under it; inking-disks supported below the bed or table; inking and impression rollers carried by the sprocket-chains and connected therewith in such a way as to cause the inking-rollers to travel over and in contact with the inking-disks, and to allow the impression-roller to pass over without coming in contact therewith; and means for automatically rotating the inking-disks.

6. A press comprising a bed or table upon which the form can be arranged; rotating wheels arranged at the opposite ends of the bed or table; chains, or the like, carried by said wheels and arranged to advance over the bed and to return under it; an inking-surface arranged below the bed or table; inking and impression rollers carried by the chains or like devices; tracks upon which the rollers can travel in passing over the bed or table; journals or bearings by which the inking and impression rollers are attached to the endless chains, whereof those of the inking-rollers are shorter vertically than that of the impression-roller; guides under which the journals or bearings pass as the rollers advance over the bed or table, for holding the impression-roller against rising in passing over the form; tracks upon which the roller-journals can travel in passing below the bed or table, said tracks being positioned so as to allow the inking-rollers to rest upon the inking-surface in passing over it, and to support the impression-roller above and out of contact therewith; and means for shifting the inking-surface upon each revolution of the inking and impression rollers.

7. In a press, the combination with the bed or table, the endless carrier provided with inking and impression devices, wheels for said carrier, the shiftable inking-surface, and mechanism for shifting the latter, of a device carried by the endless carrier and adapted to automatically actuate said shifting mechanism so as to cause the same to automatically shift the inking-surface.

8. In a press, the combination of a swinging lever, means for actuating the same after the taking of each impression; a clutch for automatically stopping the press; a longitudinally and laterally shiftable link, arranged to operate the clutch when shifted longitudinally and adapted to be automatically engaged and shifted longitudinally by said lever, and also to be moved laterally so as to prevent its being engaged by the lever; and a spring for holding the link normally in position to be engaged by the lever.

9. In a press, the combination with the bed

or table, the inking and impression devices, and with mechanism for operating the latter, of a shiftable inking-surface, mechanism for automatically shifting the inking-surface after the taking of each impression, and also for either automatically stopping the press, or allowing the same to run continuously, at will; and means for simultaneously actuating both the ink-surface-shifting mechanism, and the stopping mechanism.

10. In a press, the combination with the endless chain or the like, the inking-rollers carried thereby, and the wheels for the chains, of an inking-surface capable of shifting movement; a ratchet-wheel connected with such surface so that when turned it will shift the same; a pawl acting upon said ratchet-wheel; a reciprocating rod actuating the pawl; a bell-crank lever having one of its arms pivotally connected with the reciprocating rod, and the other extended in a way to cause it to be struck and actuated by the impression-roller; and a spring for automatically returning the bell-crank lever to its original position and thereby actuating the ratchet-wheel so as to shift the inking-surface.

11. In a press, the combination with the bed or table, the inking and impression rollers, and means for advancing such rollers over the bed or table, of tracks upon which the rollers can travel; vertically-adjustable guides suspended above the path of travel of the impression-roller bearings or journals; and means for subjecting said guides to tension tending to force them normally downward upon said impression-roller bearings or journals.

12. In a press, means for automatically stopping the same, comprising a pulley loose on the driving-shaft, rotating arms fast on the same; sliding arms carried by said rotating arms and provided at their outer ends with friction-shoes adapted to engage the pulley-rim; a friction device, such as the friction-wheel 7, mounted loosely on the driving-shaft, and engaged by the inner ends of the sliding arms, so that when turned in one direction relatively to the fixed arms, it will throw the former outward into position to cause their friction-shoes to engage the pulley-rim, and when turned in the other direction, it will retract the same so as to withdraw their friction-shoes from the pulley-rim; spring means for holding the friction device in position to cause the engagement of the friction-shoes with the pulley-rim; and mechanism for automatically applying friction to the loose friction device so as to cause it to retract the sliding arms and thereby withdraw the friction-shoes thereon from the pulley-rim.

13. In a press, means for automatically stopping the press, comprising a pulley loose on the driving-shaft; rotating arms fixed thereon; sliding arms carried by the fixed arms and provided at their outer ends with friction-shoes adapted to engage the pulley-rims; a friction-wheel 7 mounted loosely on the

driving-shaft, and engaged by the inner ends
of the sliding arms; springs for holding said
loose friction device in position to retain the
friction-shoes on the sliding arms normally
5 in engagement with the pulley-rim; a sliding
link provided with a friction-block adapted
to engage the rim of the friction-wheel 7; a
lever arranged and adapted to engage and
operate the sliding link; and mechanism for
10 automatically actuating said lever.

14. In a press, the combination with the
shiftable inking-surface, and with mechanism

for shifting the same, and also with a device
for stopping the press, of mechanism for au-
tomatically and simultaneously actuating 15
both the mechanism for shifting the inking-
surface, and the device for stopping the press.

Signed by me at Chicago, Illinois, this 4th
day of November, 1898.

ALLISON R. STONE.

Witnesses:

A. MILLER BELFIELD,
L. M. BULKLEY.