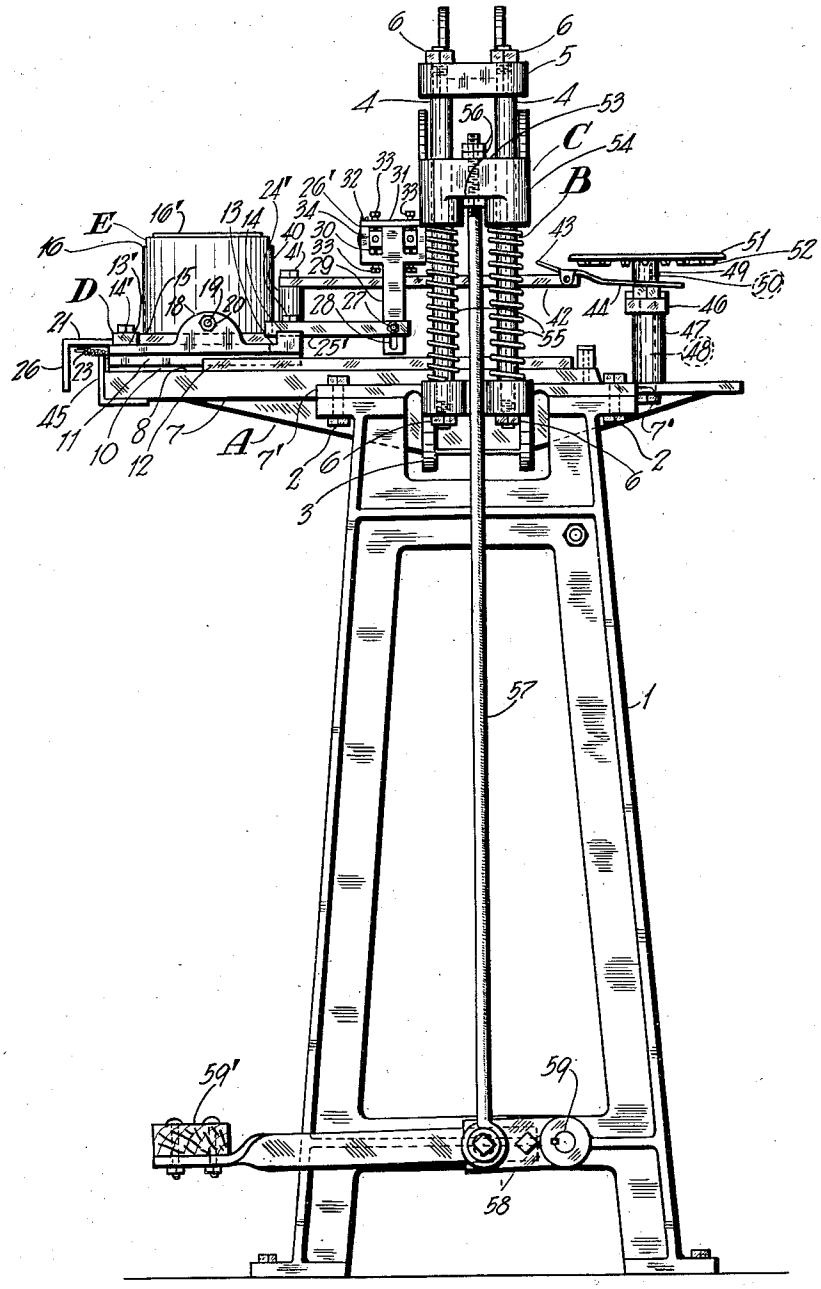
April 21, 1931. A. F. BISCHOFF 1,801,899

PRINTING PRESS

Filed May 13, 1929 4 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

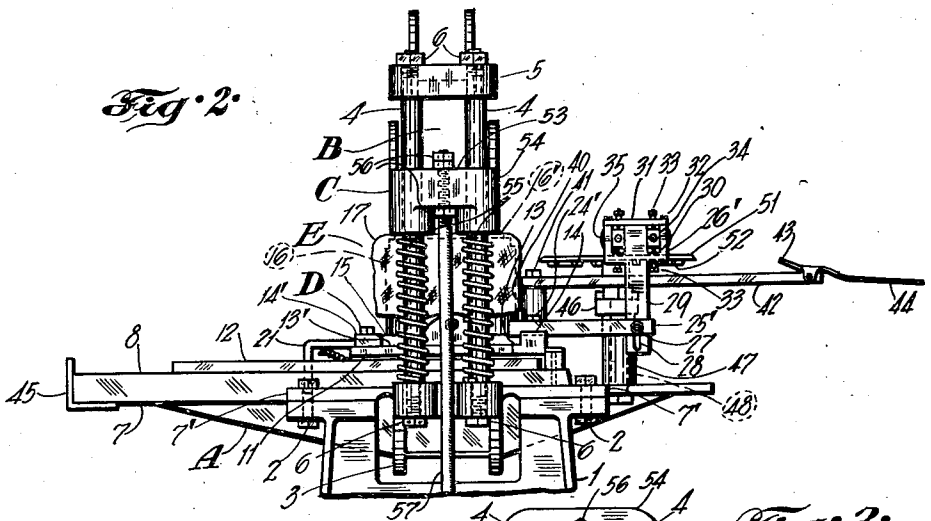
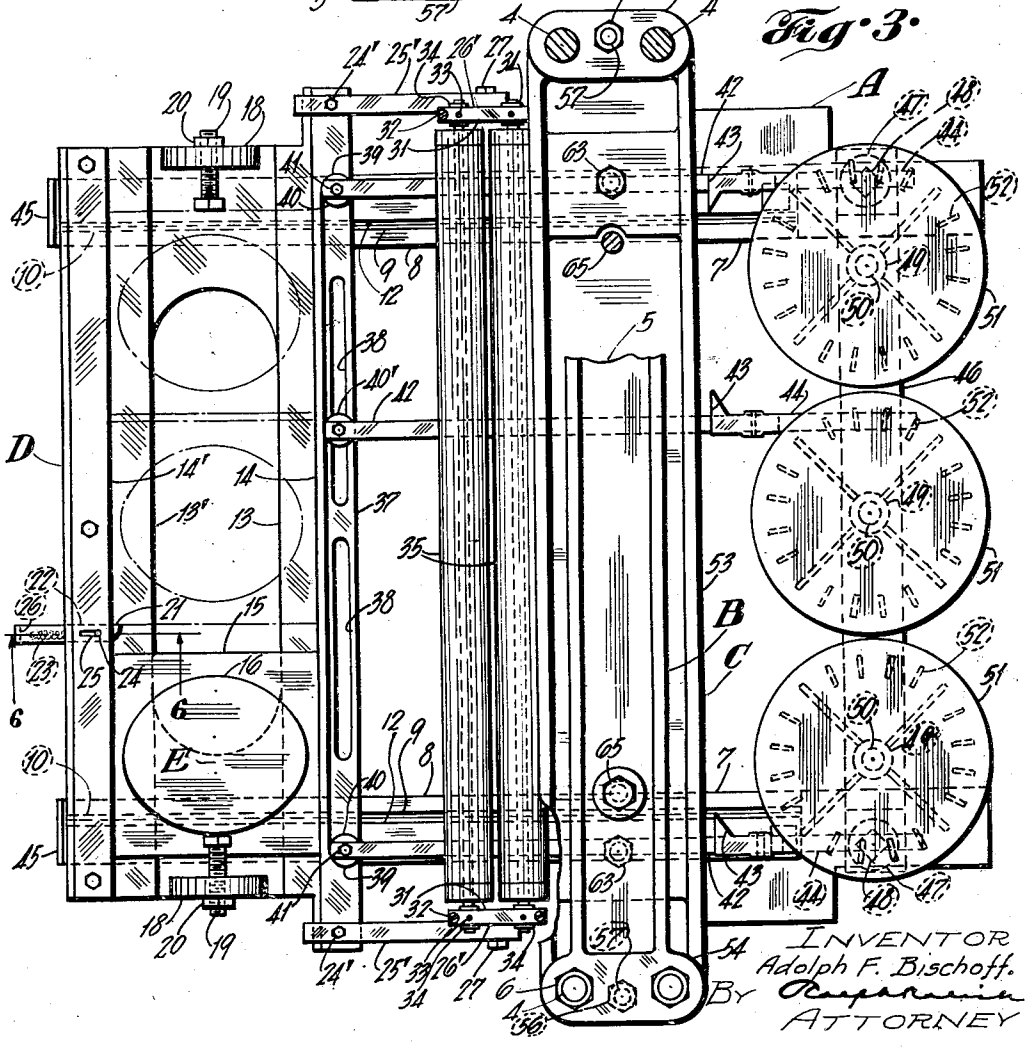


Fig. 3.



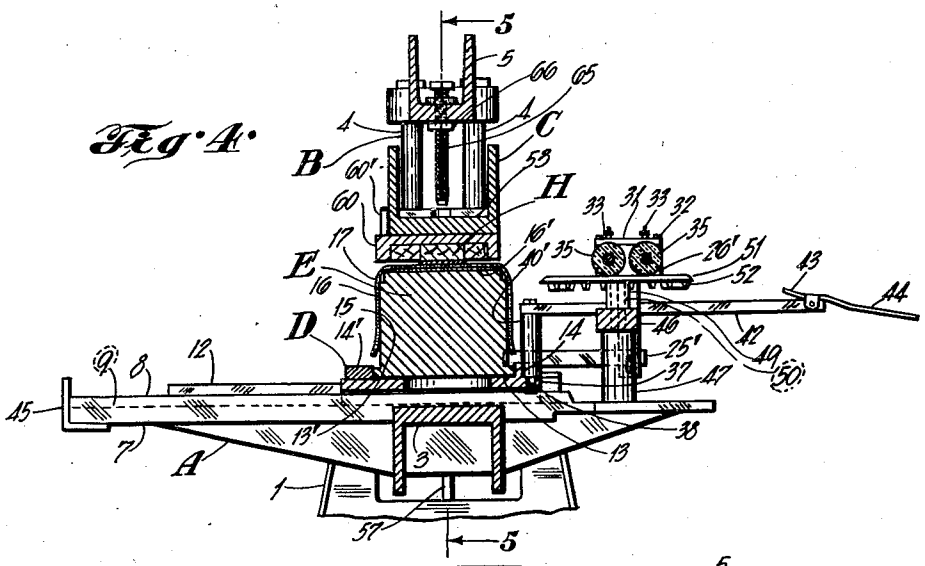
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Fig. 4.



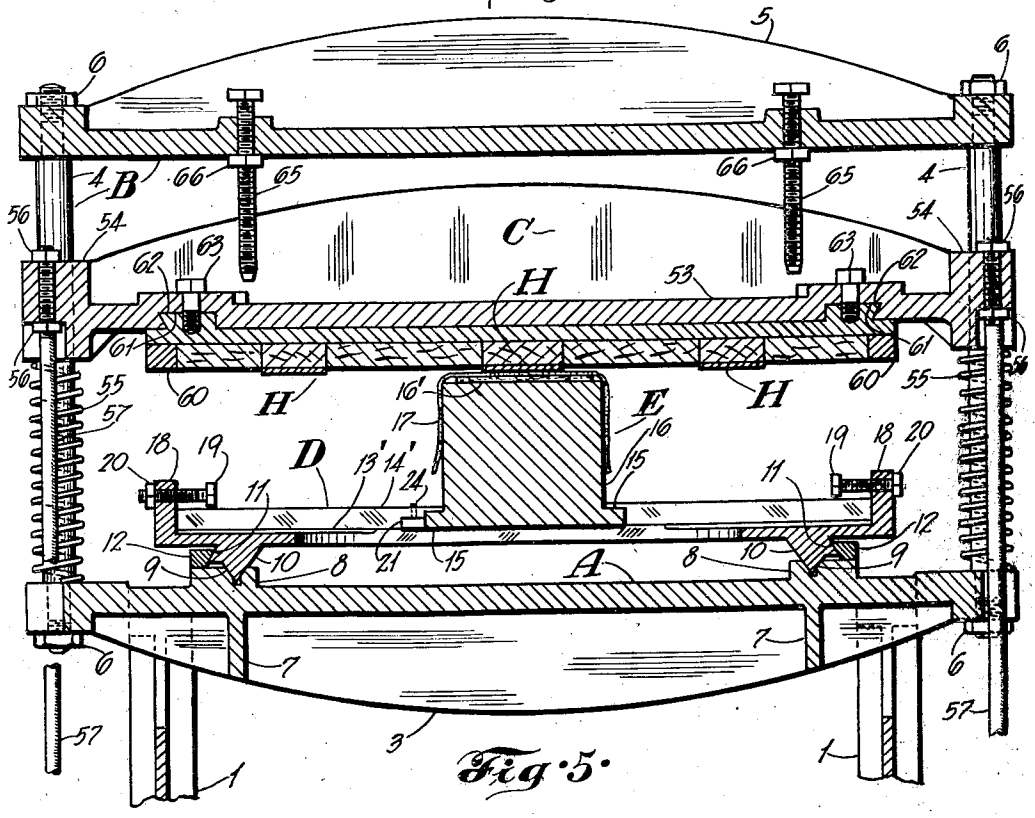


Fig. 5.

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Fig. 6.

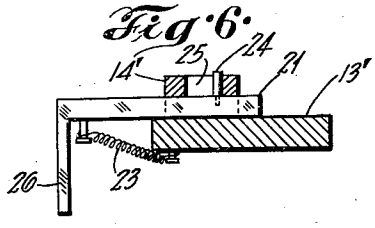


Fig. 7.

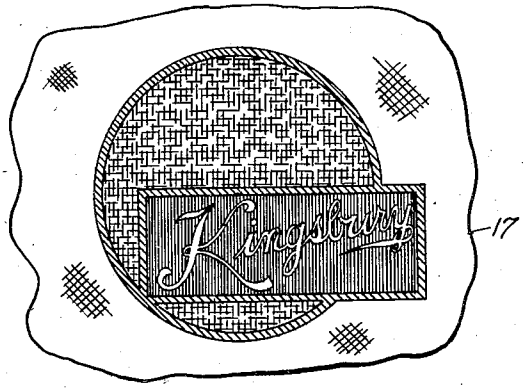


Fig. 8.

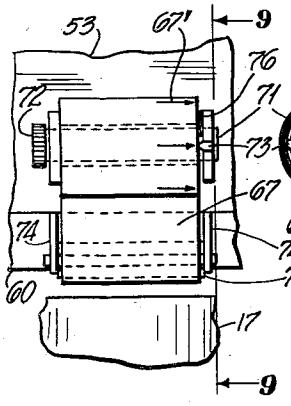
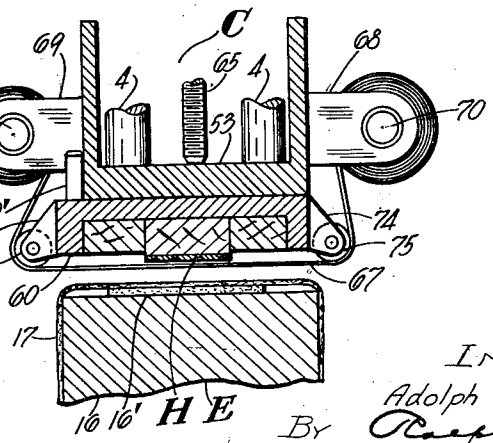


Fig. 9.



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Patented Apr. 21, 1931

1,801,899

UNITED STATES PATENT OFFICE

ADOLPH F. BISCHOFF, OF ST. LOUIS, MISSOURI, ASSIGNOR TO LANGENBERG HAT COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI

PRINTING PRESS

Application filed May 13, 1929. Serial No. 362,505.

This invention relates generally to printing presses and more particularly, to a certain new and useful improvement in printing presses of multi-color type.

My new press is especially, though not exclusively, adapted for use in printing multi-colored impressions or so-called dies on hat-linings and the like, and the prime object of my invention is to provide a printing press of the type stated by means of which successively complementary impressions forming or constituting the particular die may be rapidly and conveniently made on the lining or other printable material.

My invention has for a further object the provision of a printing-press of the type and for the purpose stated which may be economically constructed, which is sturdy, strong, and durable, which is conveniently operable, and which is efficient in the performance of its intended functions.

And with the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts hereinafter described and pointed out in the claims.

In the accompanying drawings,—

Figure 1 is a side elevational view of a printing-press embodying my invention;

Figure 2 is a fragmentary side elevational view of the machine, showing the platen-carriage in its printing position;

Figure 3 is an enlarged broken plan view of the machine;

Figure 4 is a fragmental transverse sectional view of the machine;

Figure 5 is an enlarged sectional view of the machine taken approximately along the line 5—5, Figure 4;

Figure 6 is a fragmentary sectional view taken approximately along the line 6—6, Figure 3;

Figure 7 is a plan view of an illustrative design or die for printing by the machine;

Figure 8 is a detail front view of an associated device for feeding foil-material to the printing-press, a fragmentary portion of the latter being shown in connection therewith; and

Figure 9 is a sectional view along the line 9—9, Figure 8.

Referring now more in detail and by reference characters to the drawings, which illustrate a preferred embodiment of my invention, the main frame of the machine preferably includes a pair of spaced rigid A-frames or floor stands 1, 1, fixed upon which by suitable fastening elements 2, 2, is a horizontally disposed bed or table-member A. In the present machine, the plate A preferably comprises a main longitudinal inverted channel-shaped member 3 extending at each of its opposite ends beyond the respective A-frames 1, 1, for supporting attachment thereto of pairs of upstanding parallel laterally spaced rigid guide-rods 4, 4, whose opposite end-portions are preferably reduced in diameter and snugly fitted at their lower extremities into the member 3 and at their upper extremities into a longitudinal channel-shaped arch-piece or beam 5 disposed horizontally opposite the table-member 3.

Suitable fastening elements or nuts 6, 6, threadedly engage the respective reduced ends of the guide-rods 4, 4, and abut the members 3 and 5 for firmly drawing the shoulders of the reduced end-portions of the rods 4 thereupon to form a rigid longitudinal upstanding rectangular frame B, in which is adapted for vertical reciprocation a pressure-head C carrying an aligned plurality of complementary impression-blocks H, presently described. Preferably integrally united to the table-member 3 for front and rear presentation from the rectangular frame B, is a pair of transverse-parallel carriage-supports or T-beams 7, 7, whose depending stems are conjoined to the flanges of the member 3 (Figure 5) for the purpose of strength and rigidity. The outside flanges of the respective T-beams 7, 7, are intermediately extended to form lugs 7′, 7′, seated on suitable pads or supporting members provided on the respective A-frames 1, 1, and secured thereto by the fastening elements 2, 2.

Presented upwardly from each of the T-beams 7, 7, is a rib 8, Figure 5, whose upper surface is provided with an inverted V-shaped way 9 extending from the front of the ma-

chine to a point in the rear of, and through, the frame B. Slidable on the ways 9, 9, is a carriage D comprising a preferably trough-shaped member having at its opposite ends depending V-shaped or faced guide-members 10, 10, each slidably coacting with one of the ways 9, 9, for supporting the carriage D in its reciprocatory movements through the frame B and into the printing plane of the impression-blocks H, as will shortly be described. Each guide-member 10 is provided with a laterally presented angular face 11 slidably coacting with a retaining gib 12 mounted on the respective ribs 8, 8, for holding the carriage D on the ways 9.

Disposed longitudinally of the machine on the carriage D, is a pair of parallel flat ways 13, 13′, Figure 3, one or the rear way 13 having an integrally formed upstanding wall or rib 14, and the other or forward way 13′ having a detachable rib 14′, the ways thus formed being slidably engaged by a laterally presented bottom flanged portion 15 of a platen-block E for translation thereof on the carriage D from side to side of the machine parallel with the axis of the presser-head C and its carried impression blocks H, for purposes soon appearing.

The platen-block E preferably includes an upstanding rigid body 16 of suitable shape and conformation for supporting the article to be printed, as a hat-lining 17 of textile material, with which the machine is particularly adapted for employment. On the upwardly presented face of the block 16, is preferably disposed a mat of resilient material or so-called "blanket" 16′, on which the printable part of the hat lining 17 is placed, as will presently more fully appear.

At its opposite ends, the carriage D has upstanding lugs 18, 18, each having adjustably threaded therethrough a stop-member or bolt 19, whose head, presented inwardly of the carriage, is impinged by the platen-block E at the opposite extremities of its movement for adjustably limiting the cross-travel thereof on the carriage D. The bolts 19 are frictionally locked in adjusted position by means of lock-nuts 20 threaded to the outer ends of the bolts and abutting the respective lugs 18, 18.

At one or more intermediate portions of the carriage D, a latch-bolt 21, Figure 3, slidable through a suitable aperture 22 in the detachable rib 14′, is tensionally presented by a spring 23 over the way 13′ into the path of the platen E, the latch-bolt 21 having an upstanding pin 24 working in a suitably provided slot 25 in the rib 14′ for limiting the reciprocations of the bolt, which may be manually operated for releasing movements by grasping a forwardly disposed depending handle 26. One such latch-bolt 21 is shown in the present embodiment, the latch-bolt 21 co-operating with the platen E for determining an intermediate printing position thereof, so that, as shown, the press may be employed to apply three colors or impressions successively on the printable material 17 placed on the platen E for that purpose, as will presently appear; but I may here state that the bolts 19 and latch 21 permit the selective location of the platen E opposite the respective impression blocks H for printing registration therewith.

Secured by suitable fastening elements or studs 24′, 24′, Figure 3, to the oppositely extended ends of the rear rib 14, are rearwardly presented supporting members or arms 25′, 25′, each carrying an upstanding roll-head or bracket 26′, which are vertically adjustable in any suitable manner; preferably, however, I employ for such purpose a bolt 27, Figure 1, passed through the arm 25′ and working in a slot 28 in the lower end of a depending leg 29 of the roll-head 26′, whereby the same may be adjustably clamped on the arm 25′. Each roll-head 26′ is forked, as shown, to provide a pair of vertical parallel spaced guide-slots 30, 30, opening through the upper side of the head, and closed thereat by a horizontal member 31 secured by suitable fastening elements or screws 32 to the head.

Slidable in each guide-slot 30, and vertically adjustable therein by means of screws 33, 33, presented into the slot, one upwardly from the lower side thereof and the other downwardly from the member 31, is a bearing-block 34, each respective pair of bearing-blocks 34, 34, having journaled therein an inking-roll 35, Figure 3, constructed of a material and in a manner suitable for the purpose intended, as well known to those skilled in the art. In the embodiment shown, two parallel inking-rolls 35, 35, are provided, although more or less than two may be provided, at the option of the person constructing the machine, the rolls 35, 35, being arranged with their axis of rotation parallel with, but movable with the carriage D transversely of, the axis of alignment of the impression-blocks H.

Intermediate its ends, the rear rib 14 is formed with an angle cross-section, the outstanding leg 37 thereof being on the lower side of the rib and provided with a plurality of aligned longitudinal slots 38, 38, for a purpose soon appearing. Where the angle-section of the rib 14 joins the end-portions thereof, the inner wall of the upstanding leg of the angle is curved rearwardly, as shown at 39, 39, forming oppositely disposed approximately semi-circular recesses in each of which is seated a post 40, Figures 3 and 4, having secured to its upper end, by a suitable fastening element or screw 41, a rearwardly presented preferably horizontally disposed ratchet-support or arm 42, whose rear free end has suitably pivoted thereto a swingable inking-disc ratchet or finger 43 preferably

counterweighted by an integrally formed rearward extension 44, so that the finger 43 tends by its own weight to take its operative position, soon to be described.

Adjustably clamped to the leg 37 intermediate its ends and over one of the slots 38, is a post 40′ similarly carrying an arm 42, clamped to the leg 37, whereby the arm 42 may be adjustably positioned longitudinally the carriage D, that is, towards one side or the other of the machine, for a purpose also soon appearing. One or more arms 42 may be thus mounted intermediately the carriage D, although in the present embodiment a total of three arms or ratchet-supports, with their carried ratchet-fingers, is shown, one at each end of the carriage and the other intermediately thereof.

Mounted on the T-beams 7, 7, at the forward ends of the ways 9, 9, are stops in the form preferably of suitable upstanding members or angles 45, 45, Figure 1, and at their rear ends the ways 9, 9, terminate short of the rear ends of the respective T-beams 7, 7, which latter, at the rear of the machine, are united by a superposed longitudinal member 46, mounted at its opposite ends on upstanding hollow posts 47, 47, by suitable means, as bolts 48, 48, each passing through an end of the member 46, the interposed post 47, and the rear end of the T-beam therebelow. Each having a depending hub 49 journaled on respective pins 50 upstandingly spaced from the member 46, Figures 1 and 3, is a plurality of aligned sources of ink-supply preferably including horizontally rotatable circular ink-carrying members or inking-discs 51, there being three such in the present embodiment, each arranged opposite to, and preferably aligned on an axis parallel to the axis of alignment of, the impression blocks H, for a purpose shortly appearing, each inking-disc 51 having a circumferential series of depending ratchet-lugs 52 for co-operation with one of the ratchet-fingers 43, whereby, as the carriage D is reciprocated, the ratchets 43 will freely pass to the rear of and under the respective inking-discs 51, but on the forward movement of the carriage, the ratchets 43 will respectively engage one of the ratchet-lugs 52 therewith aligned for intermittent rotation of the inking-disc 51, so as to present a fresh inking surface to the inking-rolls 35 when the carriage D is again reciprocated.

The inking-rolls 35, 35, it will be understood, are vertically adjustable, as described, for regulating the pressure of rolling contact of the inking rolls with the respective inking-discs on reciprocation of the carriage; and I may here point out that the inking-rolls 35, 35, have a plurality of peripherally-inked areas longitudinally spaced therealong, and it will be readily seen that by thus providing a plurality of such inked areas each independent of the other, a variety of colors or inks may be applied in a suitable series or arrangement on the rolls, each corresponding to one of the printing positions of the platen E, as shortly appearing.

The presser-head C is movable towards or away from the bed A and preferably includes an inverted channel-shaped beam 53, Figures 4 and 5, having at its opposite ends cross-heads 54, 54, each suitably apertured for sliding engagement with, and guided by, the adjacent pair of guide-rods 4, 4, the beam 53 being normally upwardly urged towards the arch-beam 5 by springs 55, 55, each mounted on one of the guide-rods 54 with their ends, respectively, abutting the frame-member 3 and the superposed cross-head 54.

The operating means for the presser head C opposes the springs 55 for pressing the head C to the platen E and preferably comprises a pedal-operated mechanism now to be described. Each having its upper end threaded for suitable fastening devices, as nuts 56, 56, for adjustable attachment to the respective cross-heads 54, 54, and disposed at opposite ends of the presser-head C, are pedal rods 57, 57, each pivoted at its lower end on one of a pair of pedal-arms 58, 58, Figure 1, mounted at the opposite ends of a shaft 59 journaled in suitable bearings provided in the lower portions of the frames 1, 1, the forwardly presented ends of the pedal-arms 58, 58, being united across the front of the machine, for convenience of the operator, by a pedal-bar 59′.

Detachably mounted on the underside of the presser-beam 53, is a printing-frame 60, Figure 5, preferably rectangular in plan, having at its opposite ends upstanding dovetails 61, 61, slidable into corresponding grooves 62, 62, provided in the beam 53, stop-pins 60′ being provided on the frame 60 for impinging the beam 53, Figure 4. The printing-frame 60 is detachably secured to the presser-beam 53 by suitable fastening elements or studs 63, 63, passed through the beam 53 for threadedly engaging the respective dovetails 61, 61. Secured in the printing-frame 60, in a manner well known to those skilled in the art, is a plurality of aligned complementary impression-members H, whose axis of alignment is preferably disposed longitudinally of the machine, and which, in the present instance, may conveniently take the form of so-called printing-blocks, each printing-block H being suitably prepared, as well known in the printing art, to impress on the article to be printed that portion of the design which is to be colored with the ink applied to the block, so that, the blocks H being arranged in a series across the path of travel of the carriage D and its carried platen E for sequential application to the article to be printed, as, for example, the hat lining 17, and the latter being moved successively from registration with one printing block to an-

other, the design intended to be printed will be built up, part by part, to form the completed impression, one form of which is suggested in Figure 7.

Threaded through, and depending from the arch-beam 5, is a pair of stop-pins 65, 65, presented in the path of the presser-head C for impinging the upper side of the beam 53 thereof for thus adjustably limiting its upward movement, a suitable means, as a lock-nut 66, being threaded to each of the stop-pins 65 for frictionally locking the same in adjusted position, Figure 5.

By suitably adjusting the stop-pins 65, 65, the presser-head C is brought to the proper level or plane of the inking-rolls 35, 35, for regulating the pressure of rolling contact of the inking-rolls with the printing faces of the blocks H, each inked-area on the surface of the rolls contacting one of the blocks for the application thereto of the proper color or kind of ink, according to the requirements of the design to be printed.

My new press is particularly, though not exclusively, adapted, as I have stated, for employment in the printing of designs or impressions on hat-linings, an illustrative design for the purpose being shown in Figure 7. As is well known, hat-linings are usually woven or otherwise suitably prepared conformably to the shape of the hat-body into which they are to be fitted. The platen E is, therefore, preferably constructed in a similar shape, in order that the lining, as 17, may lay nicely thereupon, with its central printable area resting on the mat 16′. As the carriage D is reciprocated on the ways 9, 9, the platen E will be moved under the presser-head C in a path aligned with one of the printing-blocks H for printing registration therewith. In the embodiment shown, there are three printing-blocks H carried by the presser-head C, and on the carriage D are means for locating the platen E in any one of three printing-positions opposite to, and for registration with, one of the impression-blocks H, the end positions being determined by the impingement of the platen E with the respective end stops 19, 19, and the intermediate position being determined by the latch-bolt 21, which normally yields to movement of the platen-block E on movement thereof from right to left for latching the same against reverse movement.

Figure 7 represents a three color impression, the colors being red, yellow, and green. For the purpose of illustration, it will be assumed that the back-ground yellow is to be printed first, then the red ground in the name-plate, then the green borders. The inking-discs 51 are, therefore, supplied with inks, respectively, of yellow, red, and green color, from right to left. When the carriage D is slid to the rear, the inking-rolls 35, 35, will take up the inks that are on the inking-discs and will thus have a longitudinal series of inked areas, each separate from the other, colored yellow, red, and green. The printing-blocks H are disposed on the presser-head C in alignment with the respective inked areas on the rolls 35, the latter, of course, inking the respective blocks as the carriage D is moved forwardly on the machine. Each printing block H carries that part of the design to be printed in the color of ink applied thereto by the rolls, the blocks being complementary to each other, as will be understood. For impressing the yellow part of the design on the hat-lining 17, the platen E is moved to the extreme-right-hand of the machine, being thereby automatically aligned in its first printing position, and when the carriage D is moved to the rear of the machine, the platen E will be in registration with the presser-head C under the yellow-inked printing block. The operator, applying foot-pressure on the pedal bar 59′, depresses the presser-head C upon the platen-block E, the hat-lining 17 being printingly engaged between the printing block H and the mat 16′. When the operator releases the pedal bar 59′, the presser-head C is automatically returned to elevated position. The carriage D is then shifted forwardly of the machine and the platen E moved leftwise on the carriage past the latch 21, and then brought to bear against the later for alignment with the red-inked printing block H for automatic alignment with the second printing position, when the foregoing operation is repeated.

Finally, the platen E is moved to its extreme left-hand position for registration with the green-inked printing block H. With the last impression, the complete design is impressed on the hat-lining, and I may here point out that by my new press not only is the hat-linnig printed in a much quicker and more economical manner that would be the case if a separate printing press were employed for each color or ink to be applied, but also a further advantage obtains in that the registration of the component colored parts of the design is automatically assured, once the printing blocks have been set up in the machine, and the printing positions of the platen E determined; hence the employment of "match-marks" or like means for aligning the printable portion of the hat-lining with the respective printing-blocks is eliminated.

Inasmuch as the employment of gold-leaf or foil-material is common in printing hat-linings, a gold-leaf feeding device, well adapted for use in connection with my press, is shown in Figures 8 and 9. Such device includes oppositely outstanding brackets 68, 69, on the presser-beam 53, in which are respectively journaled spool-carrying shafts 70, 71, on which is to be wound a flexible

band or strip of windable material 67 having on one side a strip of gold-leaf and on the other side a plurality of indicia or indicating or measuring marks 67′, for a purpose soon appearing. The shaft 71 has a knurled bead 72, and the bracket 69 has an indicating means or pointer 73 for registration with the indicia 67′. Outstanding from opposite sides of the printing-frame 60, are brackets 74, 74, each having journaled therein a roller 75.

Resilient members or springs 76 attached to the respective brackets 68, 69, frictionally engage the spools on the shafts 70, 71, for tensionally stretching the band 67 therebetween. Initially, the gold-leaf carrying band 67 is wound on the shaft 70, then stretched over the rollers 75, 75, across the printing face of the particular printing block H selected for making the gold-leaf impression, the gold-leaf carrying side of the band being downwardly presented, with the free end of the band secured to the shaft 71, in such wise that the indicia bearing side of the band will be visually presented to the operator. By bringing the indicia 67′ successively in registration or alignment with the pointer 73, a predetermined quantity of gold-leaf will be fed beneath the particular printing-block H, the printing operation thereafter being the same as previously described for making an ink impression. The advantages of my gold-leaf feeding device are that the gold-leaf is protected from injury while not in use, that is to say, when wrapped on the shaft 68, the leaf carrying side of the band 67 is on the inside of the roll; the gold-leaf is presented for the printing operation in a smooth unbroken layer, the band 67 being stretched just enough to prevent wrinkles in the leaf, yet not so much as to tear the latter; and the minimum amount of leaf is used at each printing operation, the indicia 67′ being arranged conformably to the amount of gold-leaf required for printing the design. The device is simple, inexpensive, and reliable for the purposes intended.

My machine may as a whole be readily constructed and fulfills in every respect the objects stated.

It is to be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the machine may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a printing press, in combination, a plurality of aligned complementary impression-blocks, a shiftable platen adapted for movement both in a path parallel with and at right angles to the axis of alignment of the impression-blocks for successive registration therewith, and means for pressing the successive impression-block to the platen.

2. In a printing-press, in combination, a bed-plate, a presser-head movable towards and away from the bed-plate, a plurality of aligned complementary impression-blocks carried by the presser-head, a carriage shiftable upon the bed and under the head, a platen movable with the carriage and also shiftable relatively to the carriage for registration with the respective impression blocks, and means for shifting the presser-head for pressing the successive impression-blocks to the platen.

3. In a printing-press, in combination, a bed-plate, a frame upstanding from the bed-plate, a presser-head adapted for reciprocation in the frame towards and away from the bed-plate, a plurality of aligned complementary impression-blocks carried by the presser-head, a carriage shiftable on the bed-plate transversely of the press and under the presser-head, a platen movable with the carriage transversely of the press and shiftable on the carriage longitudinally of the press for successive registration with the respective impression-blocks, means for selectively locating the platen on the carriage for co-operative registration with the respective impression-blocks, and means for reciprocating the presser-head.

4. In a printing-press, in combination, a bed-plate, a frame upstanding from the bed-plate, a pressure-head adapted for reciprocation in the frame towards and away from the bed-plate, a plurality of aligned complementary impression-blocks carried by the presser-head, a carriage shiftable on the bed-plate transversely of the press and under the presser-head, a platen movable with the carriage transversely of the press and shiftable on the carriage longitudinally of the press for successive registration with the respective impression-blocks, means for selectively locating the platen on the carriage for co-operative registration with the respective impression-blocks, means for reciprocating the presser-head, and means for inking the several impression-blocks.

5. In a printing-press, in combination, a plurality of aligned complementary impression-blocks, a carriage shiftable relatively to the blocks, a platen movable with the carriage and also shiftable relatively to the carriage for registration with the respective impression-blocks, and means for impressing the successive blocks to the platen.

6. A printing-press including, in combination, a plurality of aligned complementary impression-blocks, a carriage shiftable into and out of the printing plane of the impression-blocks, a platen movable both with and relatively to the carriage, and means on the carriage adapted for co-operation with the platen for selectively locating the latter op-

posite the respective impression-blocks for printing registration therewith.

7. A printing-press including, in combination, a plurality of aligned complementary impression-blocks, a carriage shiftable into and out of the printing plane of the impression-blocks, a platen movable both with and relatively to the carriage, and means on the carriage adapted for co-operation with the platen for selectively locating the latter opposite the respective impression-blocks for printing registration therewith, said means including stop-members adjustably mounted at the opposite ends of the carriage, and a spring-set latch-member disposed intermediate the ends of the carriage and yieldingly movable into the path of travel of the platen.

8. A printing-press including, in combination, a plurality of aligned complementary impression blocks, a carriage shiftable into and out of the printing plane of the impression-blocks, a platen movable both with and relatively to the carriage, means on the carriage adapted for co-operation with the platen for selectively locating the latter opposite the respective impression-blocks for printing registration therewith, and means for pressing the respective impression-blocks to the platen.

9. A printing-press including, in combination, a bed-plate, a carriage reciprocable on the bed, a platen reciprocable with and also shiftable relatively to the carriage, a presser-head movable towards and away from the bed, a plurality of aligned complementary impression-blocks carried by the presser-head, means on the carriage co-operating with the platen for aligning the latter successively with the respective impression-blocks for registration of the platen with the selected impression-block on movement of the carriage thereunder, means co-operating with the presser-head for pressing the impression-blocks to the platen, a plurality of sources of ink-supply, and means supported by the carriage for alternately engaging the sources of ink-supply and the impression-blocks for transferring ink from the one to the other on reciprocation of the carriage.

In testimony whereof, I have signed my name to this specification.

ADOLPH F. BISCHOFF.