J. M. SHOURT.

CAP PRINTING MACHINE.

APPLICATION FILED SEPT. 14, 1915.

1,252,043.

Patented Jan. 1, 1918.

7 SHEETS—SHEET 1.

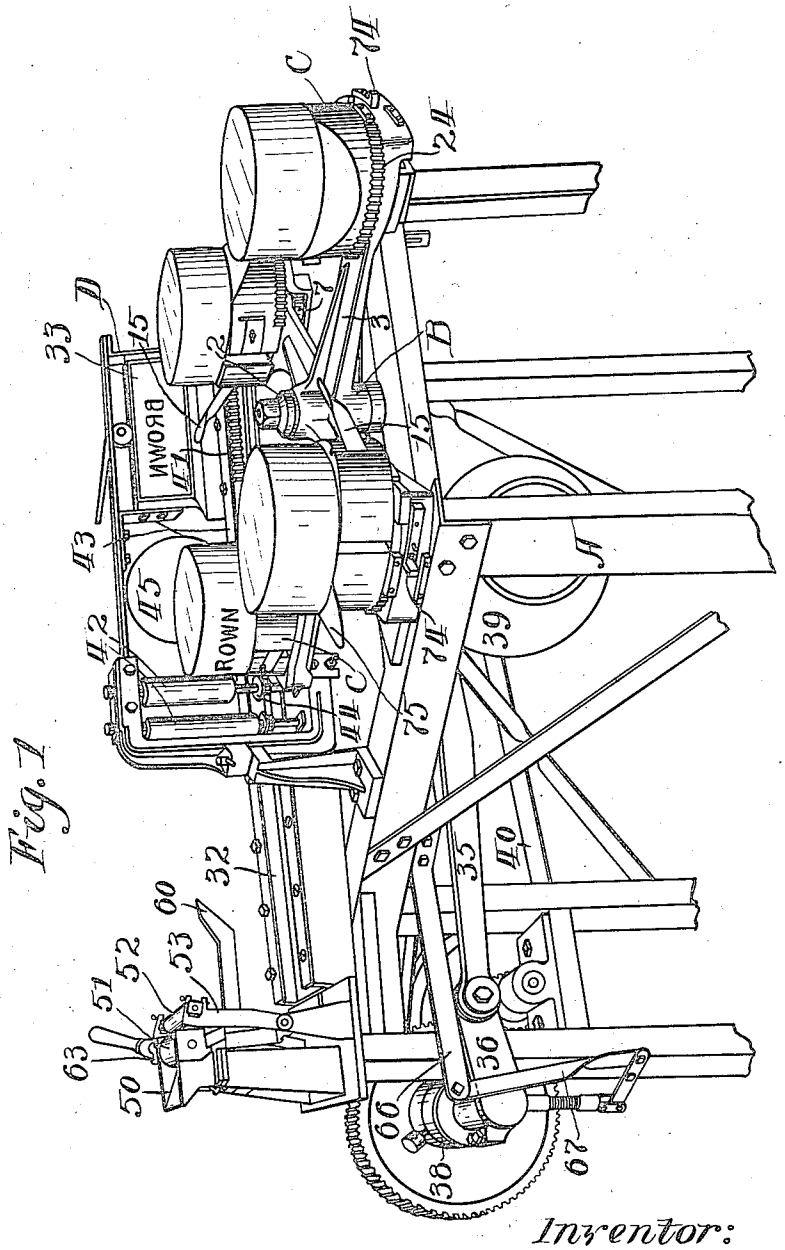

Fig. 1

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7 SHEETS—SHEET 2.

Fig. 2

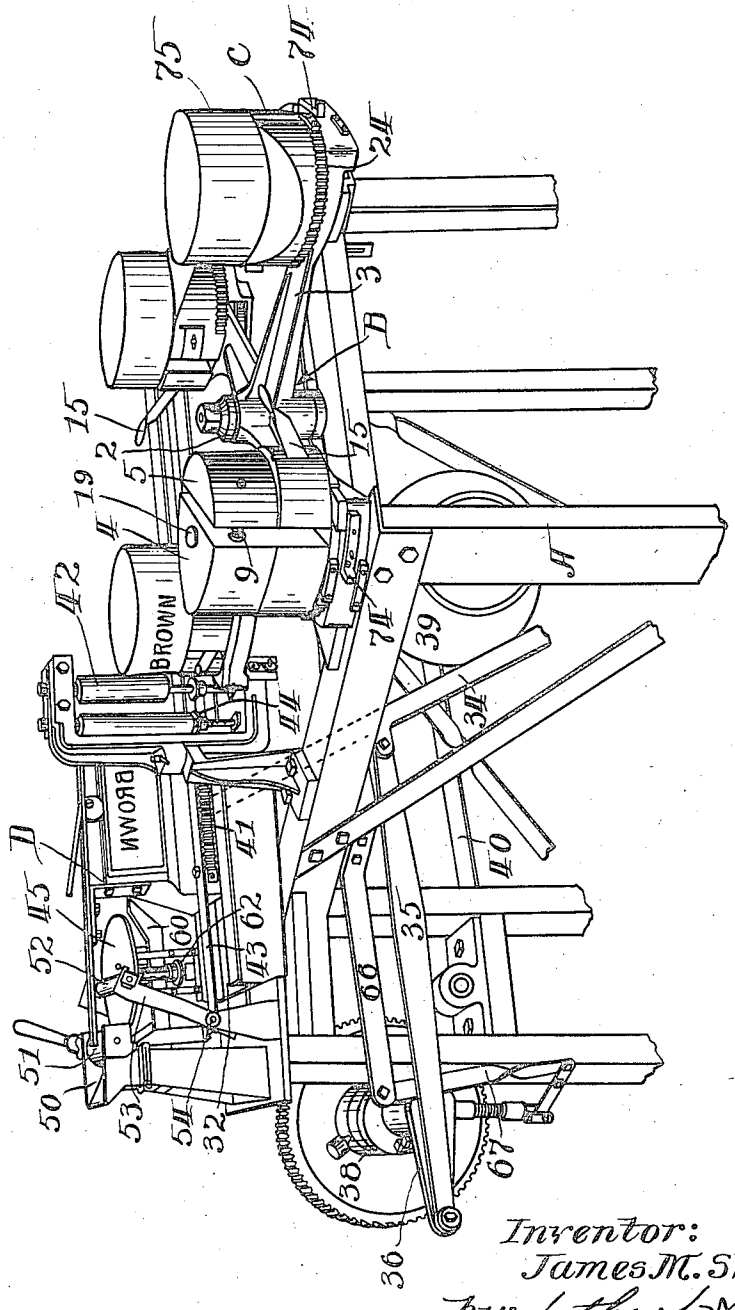

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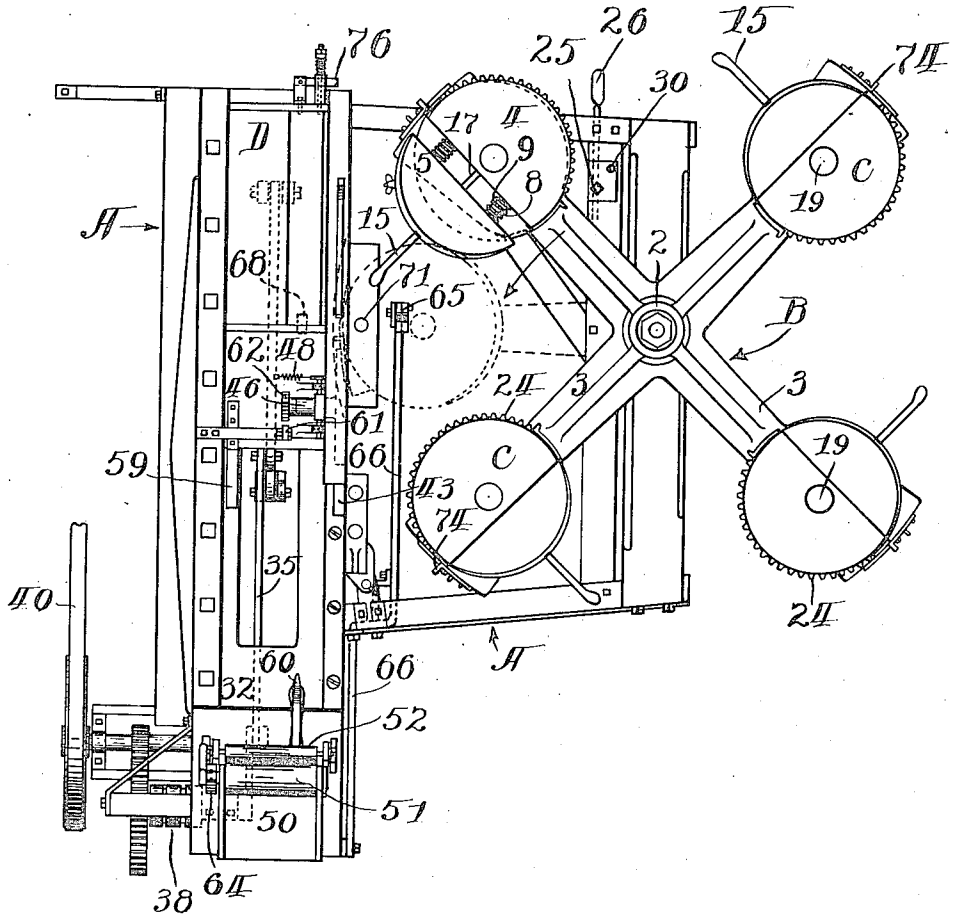
Fig. 3



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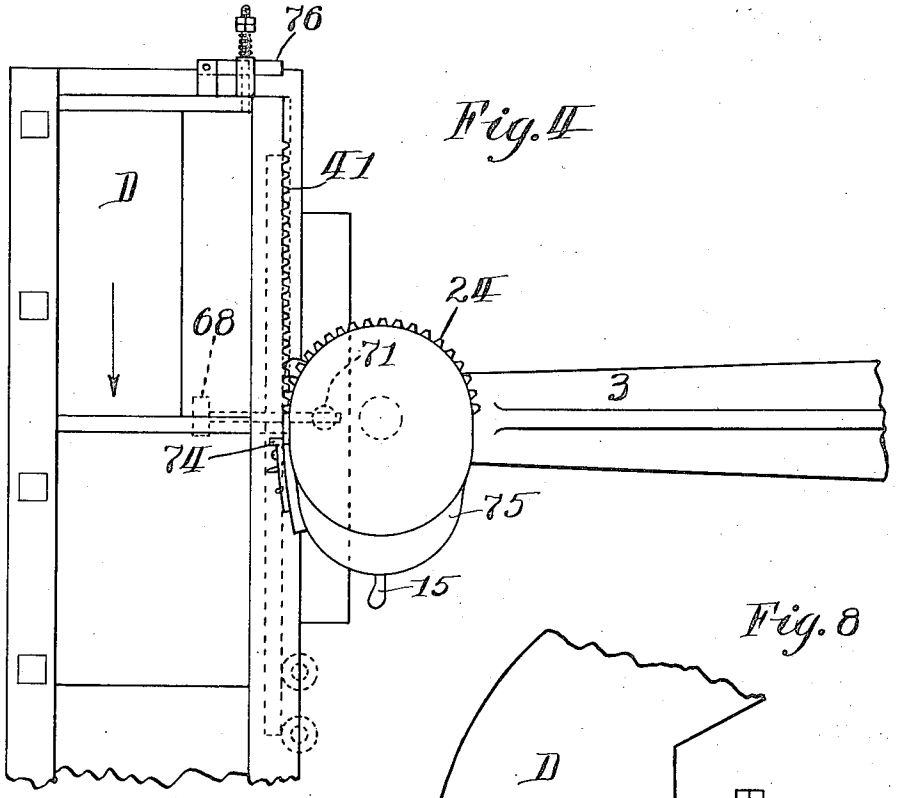

Fig. 4

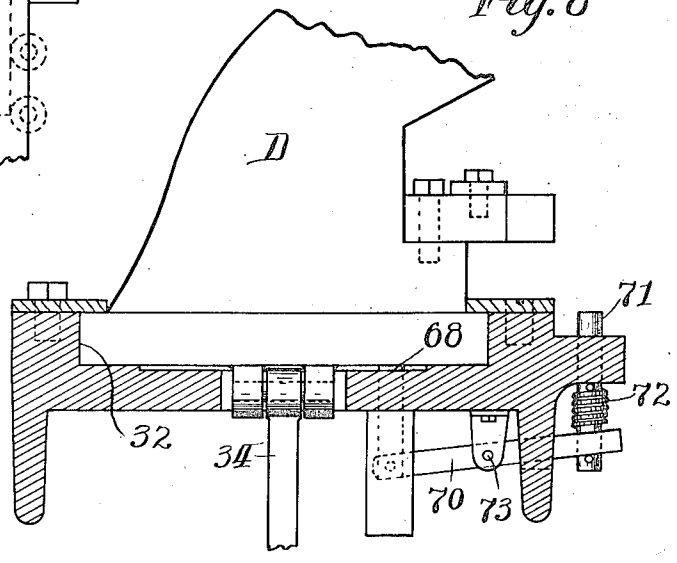

Fig. 8

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7 SHEETS—SHEET 5.

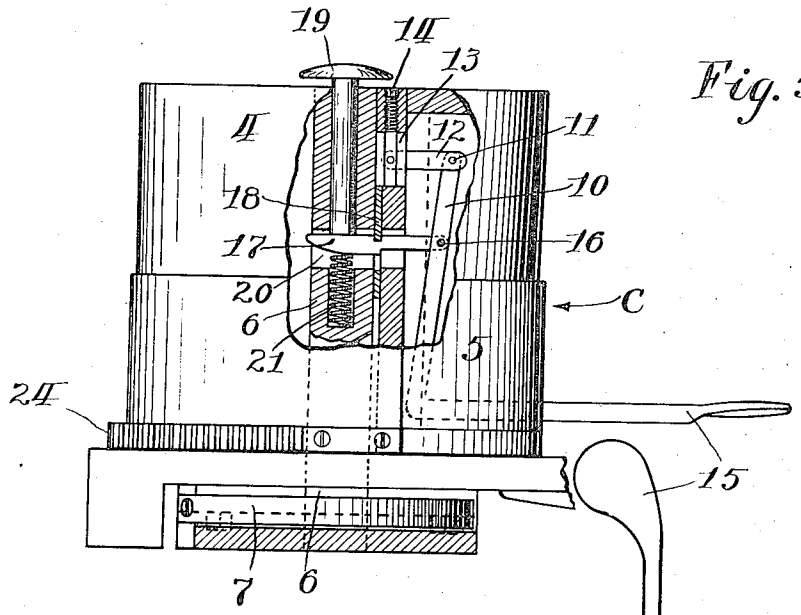

Fig. 5

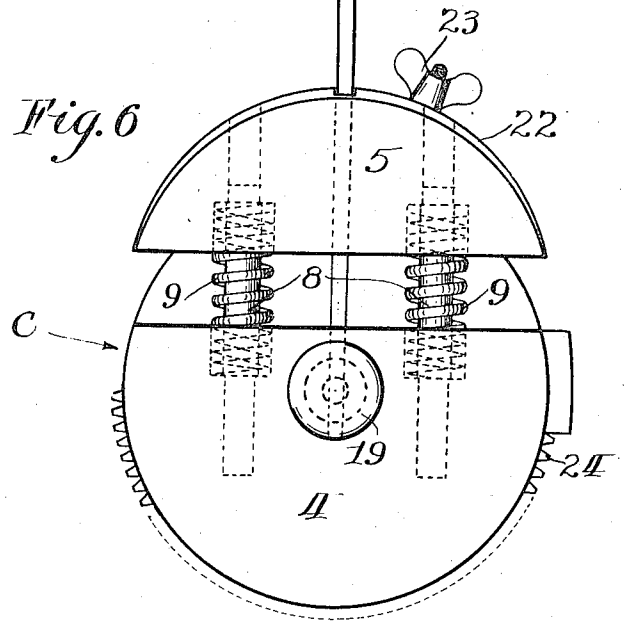

Fig. 6

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7 SHEETS—SHEET 6.

Fig. 7

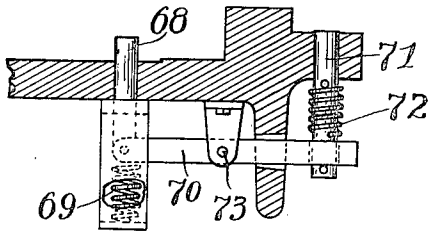


Fig. 10

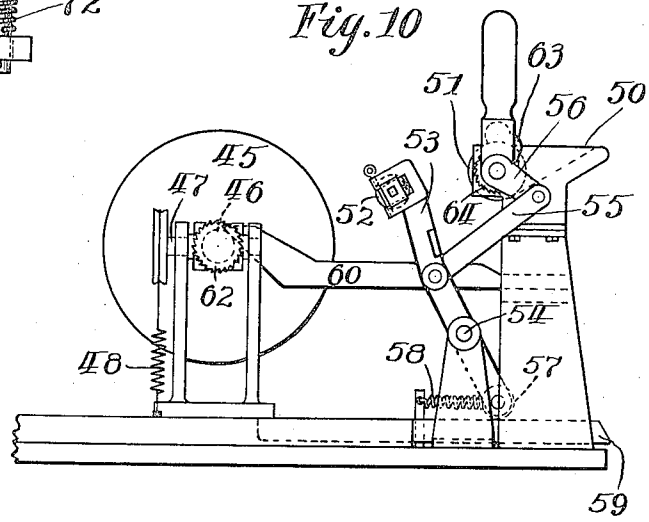


Fig. 9

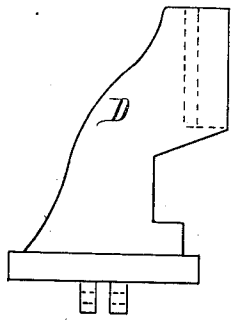
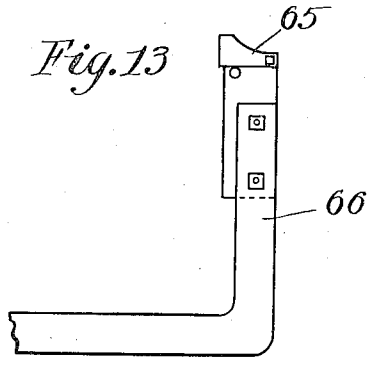


Fig. 13



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7 SHEETS—SHEET 7.

Fig. 14

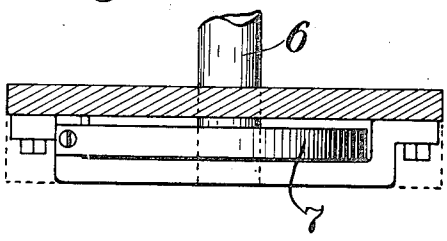


Fig. 15

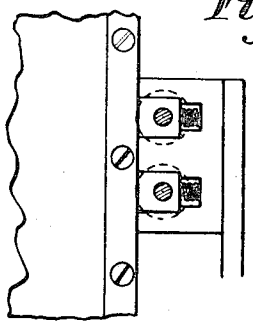


Fig. 16

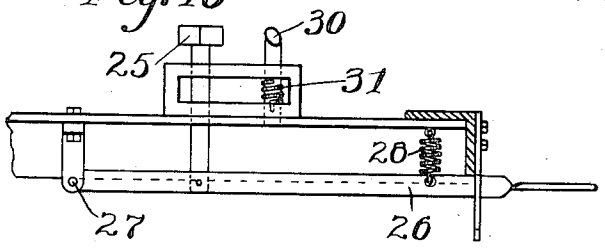


Fig. 12

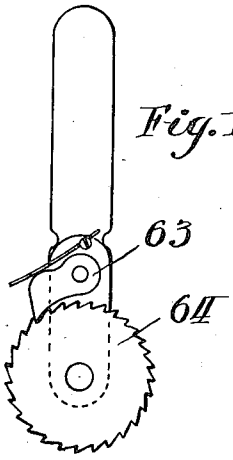
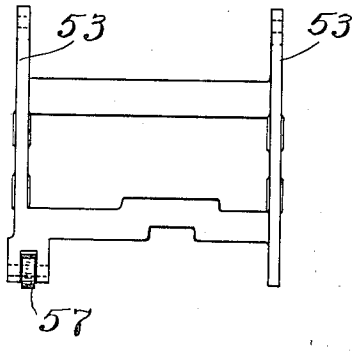


Fig. 11



Inventor:
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UNITED STATES PATENT OFFICE.

JAMES M. SHOURT, OF ST. PAUL, MINNESOTA, ASSIGNOR TO BROWN & BIGELOW, OF ST. PAUL, MINNESOTA, A CORPORATION OF MINNESOTA.

CAP-PRINTING MACHINE.

1,252,043. Specification of Letters Patent. Patented Jan. 1, 1918.

Application filed September 14, 1915. Serial No. 50,623.

To all whom it may concern:

Be it known that I, JAMES M. SHOURT, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Cap-Printing Machines, of which the following is a specification.

My invention relates to improvements in machines for printing caps, its object being to provide a machine for rapidly printing desired matter on the rim of the cap. To this end my invention consists of printing mechanism supported upon the framework of the machine, together with a plurality of cap supporting blocks so mounted on the machine as to be carried past the printing mechanism, common actuating mechanism being employed for the movable parts of the printing mechanism and the cap supporting means.

My invention further consists in improved features of construction for holding the cap taut to shape the same and while the same is being printed and for releasing the same thereafter, together with improved means for inking the type of the printing mechanism.

To this end the invention consists in the features of construction, combination, and arrangement of parts hereinafter described and claimed.

In the accompanying drawings forming part of this specification,

Figure 1 is a perspective view of my improved machine;

Fig. 2 is a similar view of the printing mechanism in a different position;

Fig. 3 is a plan view of the machine;

Fig. 4 is a diagrammatic plan view of a portion of the machine, showing one of the cap blocks contacting with the teeth of the type holder preparatory to the cap being printed;

Fig. 5 is a side view of one of the cap blocks partly broken away and partly in elevation;

Fig. 6 is a plan view of one of the cap bl cks;

Figs. 7 and 8 are views partly in section and partly broken away of parts of the cap printing mechanism;

Fig. 9 is a view of a type holder;

Figs. 10, 11, and 12 are details of the inking device;

Fig. 13 is a side elevation of a portion of the trip for throwing in the actuating clutch in the actuation of the machine;

Fig. 14 is a detail showing how a clock spring is fastened to one of the arms of the cap block frame;

Fig. 15 is a detail showing how the front ink rollers are set in the frame; and

Fig. 16 is a side view of a releasing lever adapted to be released to allow the cap supporting blocks to be carried past the printing mechanism.

Referring to the drawings A represents the framework of the machine. Rotatably supported upon a shaft 2, on the bed of the machine, is a frame B which frame includes a series of arms 3, each arm at its outer end rotatably supporting a cap holding block C. Each cap holding block comprises two sections 4 and 5, the section 4 being secured upon a post 6 rotatably journaled in the end of the adjacent arm 3, the lower end of the post being connected with the arm by a coil spring 7 by means of which spring the block is held in normal position. The section 4 is slidably connected with the section 5 by pins 8 secured in one section and slidable in the other section, spiral springs 9 being interposed between said sections to force them apart. In order to hold the sections drawn together I provide a lever arm 10 having pivotal connection 11 with a bar 12 extending outward rigidly from the block 13 secured within the section 4 as by means of screws 14. The lower end of the lever arm 10 extends outwardly beyond the block section 5 to form a handle 15. The lever arm 10 has central pivotal connection 16 with a dog 17 adapted to interlock with a plate 18 when the blocks are forced together, as shown in Fig. 5. A pin 19 is slidably supported in the block section 4 and extends downwardly through said section into the dog receiving opening 20, a spiral spring 21 standing below said pin 19.

As will be evident by referring to Fig. 5 the block sections will be forced together by pressing the handle 15 of the lever 11 downwardly, turning the lever inwardly upon its pivotal support 11 and forcing the dog 17 into the opening 20 between the pin 19 and spring 21. As the dog passes under the spring 21 the spring will force the dog into locking engagement with the plate 18.

When it is desired to cause separation of the blocks, the pressing downward of the pin 19 will shove the dog 17 out of contact with the plate 18 whereupon the springs 9 will force the sections of the block away from each other, as shown in Fig. 6. For the purpose of enlarging the block to fit a larger size of cap I provide a plate 22 adapted to be secured on the face of the block section 5 as by a thumb screw 23. As shown in Fig. 5 the upper half of the block is preferably tapered downwardly to conform to the ordinary shaped cap. Gear teeth 24 are secured around the lower edge of the block section 5 to allow the block to be rotated in the printing operation as hereinafter particularly set forth.

For the purpose of normally holding the cap block frame from rotation I provide a stop 25 having pivotal support on a lever 26 projecting outwardly from under the bed of the machine. The lever 26 has pivotal support 27 underneath the bed of the machine and is normally held raised by a spiral spring 28, the outer end of the lever extending beyond the frame of the machine to form a handle. Thus by pressing the lever 26 downward the stop 25 will be carried downwardly out of the way of the cap block frame. Coöperating with the stop 25 is a pin 30 slidably supported in front of said stop and being normally held raised by a spring 31. Thus when the cap block frame is rotated to bring one of its arms past said pin 30, said pin will spring upward behind the arm, holding the arm between the pin 30 and stop 25. The pin 30 will thus prevent any back rotation of the block frame and no forward rotation of the block frame will be possible until the stop 25 is lowered out of the way.

Arranged at one side of the cap block frame is the following described printing mechanism. A type carrier D is slidably supported in the runway 32, a type holder 33 being removably supported in the type carrier. The type carrier is connected by lever arms 34, 35, and 36 with a pin clutch 38 of usual construction, which clutch in turn is connected with a source of power, as the motor 39, by belting 40. The pin clutch being of ordinary construction and forming no part of the novelty of my invention is not shown in detail. The type carrier on its inner side carries gear teeth 41 which cooperate with the gear teeth upon the cap blocks as hereinafter set forth. Vertically disposed inking rollers 42 are journaled adjacent the inner side of the type carrier in position to ink the type, the type carrier supporting a bar 43 to engage with the rollers 44 upon the ink roller shafts, as the carrier is reciprocated to rotate said inking rollers.

An inking disk 45 for the rollers 42 has a two way pivotal support 46 and 47 upon the carrier whereby to swing into and out of contact with the inking rollers as shown in Fig. 10 and into contact with the ink delivering roller as shown in Fig. 2. A spring 48 normally holds the inking disk in the position shown in Fig. 10. Arranged at one end of the type carrier guideway is an ink pot 50, in the discharge end of which is journaled a delivery roll 51. A disk inking roller 52 is journaled in the upper ends of arms 53, said arms having fulcrum support 54 and being centrally connected by links 55 and 56 with the shaft of the ink delivering roller 51. The lower end of the arms 53 supports an anti-friction roller 57 connected with the adjacent portion of the framework by a spiral spring 58 to hold the lever arms 53 in the position shown in Fig. 1, in which position the rollers 51 and 52 stand in contact. A horizontal bar 59 projects from the type carrier to engage with the anti-friction roller 57 and in passing thereunder to turn the lever arms 53 into the position shown in Fig. 10 as the type carrier is moved toward the ink pot. In order to turn the disk 45 into position to be inked I provide a tripping arm 60 projecting forwardly from the ink pot base so as to engage with the outer end of the disk shaft, as shown in Fig. 10, and by reason of the inclined front edge of said tripping lever force said shaft down to turn said disk 45 into horizontal position as the disk is carried by the type carrier from the position shown in Fig. 10 to the position shown in Fig. 2. During this movement the bar 59 turns the lever arms 53 into the position shown in Fig. 10 to bring the roller 52 into contact with the disk, as shown in Fig. 2, and allow the disk to be inked by said roller. In the return movement of the type carrier the disk will be returned to a vertical position by the spring 48 and carried in that position past the type inking rollers 42 to ink the same. The disk 45 is given an intermittent rotary movement upon the shaft 46 through the medium of the pawl 61 supported by the guideway and engaging with a ratchet wheel 62 supported by the shaft 46 of the inking disk as said inking disk is carried past said pawl. Pawl and ratchet mechanism 63 and 64 are provided for the ink supply roller 51 to rotate said roller to keep it inked as the lever arms 53 are turned upon their fulcrum support as hereinbefore set forth.

To actuate the clutch I provide a trip 65 normally extending upwardly through the bed of the machine in the path of the arms of the block carrying frame, said trip being connected by lever arms 66 and 67 with the clutch so that as the trip is shoved downwardly by the arms of the block carrying frame the clutch will be connected to carry the type carrier the length of the runway

and back. The clutch is so adjusted that for each depression of the trip by one of the arms of the block carrying frame the type carrier will be moved the length of the guideway and back, the clutch then disconnecting and leaving the carrier motionless until the next depression of the trip.

For the purpose of holding each arm of the cap block frame in stationary position as the printing type passes the cap holding block, and thereby allow the meshing of the teeth 41 and 24 to rotate the block and allow the type to print around the rim of the cap, I provide the mechanism shown specifically in Fig. 7. This consists of a pin 68 slidable through the bottom of the guideway and adapted to be pressed upwardly by a spring 69. The pin 68 is connected by a lever arm 70 with a second pin 71 slidable upwardly through the bed of the machine in the path of the cap block frame. A spiral spring 72 is interposed between the bed of the machine and the lever arm 70 around the pin 71. The lever arm 70 has central fulcrum support 73. The pin 71 is slidable through the end of the lever 70. Fig. 7 shows the normal position the parts will be held in by the springs. Each of the arms of the block carrying frame has an opening in its under side, not shown, to receive the pin 71 when said opening registers therewith. Fig. 8 shows the pin 68 pressed down by the type carrier and the pin 71 shoved up through the bed of the machine into the path of the cap block frame. Thereafter when an arm of the cap block frame comes in contact with the pin 71 it will shove it down, which shoving down of the pin 71 is allowed by the slidable connection of the pin 71 and arm 70. As the arm passes over the pin the pin will be forced by the spring 72 up into the opening of the arm as soon as the opening comes into registration with said pin. This will hold the arm stationary causing the continued movement of the type carrier to rotate the block. As the block is rotated to complete the printing operation the gear teeth 41 will pass beyond the teeth of the block bringing the abutment 76 carried by the type carrier into contact with the abutment 74 carried by the arm 3 to turn the block carrying frame into the normal position shown in Fig. 3. By the time the abutment 76 strikes the abutment 74 the portion of the type carrier which holds the pin 68 depressed will pass said pin to allow it to be pushed upwardly by its spring and to draw the locking pin 71 downwardly out of locking position.

In operation, the sections of the cap blocks will be locked together to allow the caps 75 to be placed thereover, as shown in Fig. 2, the pins 19 of the blocks then being depressed to release the locking mechanism of the block sections and allow the sections to be forced apart, as shown in Fig. 6, to hold the cap taut. The operator will then depress the lever arm 26 to move the stop 25 out of the path of the block carrier frame, the operator then manually rotating the frame to carry one of the blocks around into the position shown in dotted lines in Fig. 3. As one of the cap blocks is in dotted position shown in Fig. 3 the locking pin 71, as hereinbefore set forth, will be shoved up into locking engagement with the under side of the block carrying arm. As the cap block passes from normal position to the dotted line position shown in Fig. 3, it will depress the trip 65, as heretofore pointed out, and throw in the clutch to connect the driving pulley with the type carrier. This will start the type carrier in its movement toward the ink pot. As the type carrier travels toward the ink pot the gear teeth 41 engaging with the teeth 24 of the block will rotate the block with its supported cap and as the printing type passes the rotating cap it will print thereon the impression of the type. As the type passes beyond the cap and the gear teeth pass out of mesh the abutment 76 will strike the abutment 74 upon the block and throw the parts into normal position, in which normal position one of the arms of the block carrier will stand between the stop 25 and the pin 30. The continued operation of the driving parts will, as heretofore described, ink the printing disk and return the type carrier to normal position, the clutch then being automatically disconnected, leaving the parts in position for a second operation.

Another function of my improved form of cap block is to shape the caps. With the sections closed, as shown in Fig. 5, the cap is easily placed over the block. By then releasing the sections through the medium of the pin 19 the sections will separate under the influence of the springs 9 to exert tension upon the cap and shape the same. The shaping process may be rendered more effective by suitably heating the block.

I claim:

1. A cap printing machine of the class described comprising a plurality of cap supporting blocks mounted on a rotatable frame, slidably supported printing mechanism, means for carrying said printing mechanism successively past said blocks with the printing type in engagement with a block supported cap, and means for rotating said block during the printing operation.

2. A cap printing machine of the class described comprising a plurality of cap supporting blocks having independent rotatable support upon a rotatable frame, slidably supported printing mechanism, means for carrying said printing mechanism successively past said blocks with the printing type in engagement with a block supported

cap, and means for rotating said block in the printing operation.

3. A cap printing machine of the class described comprising a plurality of cap supporting blocks having independent rotatable support upon a rotatable frame, slidably supported printing mechanism, means for carrying said printing mechanism successively past said blocks with the printing type in engagement with a block supported cap, and means carried by said printing mechanism to engage with said cap block after the operation of printing to turn the cap block away from said mechanism.

4. A cap printing machine of the class described comprising a plurality of cap supporting blocks having independent rotatable support upon a rotatable frame, slidably supported printing mechanism, means for carrying said printing mechanism successively past said blocks with the printing type in engagement with a block supported cap, a rotatable and tiltable inking disk forming part of said printing mechanism, and means carried by the supporting framework of the machine and engaging with said disk during the sliding movement of said printing mechanism to give the disk a partial rotation.

5. A cap printing machine of the class described comprising a plurality of cap supporting blocks having independent rotatable support upon a rotatable frame, slidably supported printing mechanism, means for carrying said printing mechanism successively past said blocks with the printing type in engagement with a block supported cap, and mechanism actuatable by the type carrier to hold the adjacent cap block locked in stationary position during the printing operation.

6. A cap printing machine of the class described comprising a plurality of cap supporting blocks having independent rotatable support upon a rotatable frame, a slidably supported type carrier, means for sliding said carrier successively past said blocks with the printing type in engagement with a block supported cap, and mechanism actuatable by the type carrier to hold the block frame locked in stationary position during the printing operation, comprising a pin depressible by the type carrier and a connected pin upwardly slidable into locking engagement with the block by the depression of said first mentioned pin.

7. A cap printing machine of the class described comprising a plurality of cap supporting blocks having independent rotatable support upon a rotatable frame, a slidably supported type carrier, means for sliding said carrier successively past said blocks with the printing type in engagement with a block supported cap, and mechanism actuatable by the type carrier to hold the block frame locked in stationary position during the printing operation, comprising a pin depressible by the type carrier, a connected pin upwardly slidable into locking engagement with the block frame by the depression of said first mentioned pin, and controlling springs for said pins releasing said locking pin after the printing operation.

8. A cap printing machine of the class described comprising a plurality of cap supporting blocks having independent rotatable support upon a rotatable frame, a slidably supported type carrier, means for sliding said carrier successively past said blocks with the printing type in engagement with a block supported cap, and mechanism actuatable by the type carrier to hold the block frame locked in stationary position during the printing operation, comprising a pin depressible by the type carrier, a connected pin upwardly slidable into locking engagement with the block frame by the depression of said first mentioned pin, controlling springs for said pins releasing said locking pin after the printing operation, and means carried by the type carrier to engage with the block frame after said locking pin is released to turn said block frame into normal non-printing position.

9. A cap printing machine of the class described comprising a plurality of cap supporting blocks having independent rotatable support upon a rotatable frame, a slidably supported type carrier, means for sliding said type carrier successively past said blocks with the printing type in engagement with a block supported cap, an inking roller supported at one end of the path of travel of said type carrier, a rotatable and tiltable inking disk, and a fixed member engageable with said disk to turn the same into engagement with said inking roller.

10. A cap printing machine of the class described comprising a plurality of cap supporting blocks having independent rotatable support upon a rotatable frame, a slidably supported type carrier, means for sliding said carrier successively past said blocks with the printing type in engagement with a block supported cap, an inking roller supported at one end of the path of travel of said type carrier, a fixed member engageable with the printing disk to turn the same into engagement with said inking roller, an ink pot, an ink delivery roller therefor, and means actuated by the type carrier to turn said inking roller into and out of engagement with said delivery roller.

11. A cap printing machine of the class described comprising a plurality of cap supporting blocks having independent rotatable support upon a rotatable frame, a slidably supported type carrier, means for carrying said carrier successively past said blocks with the printing type in engagement with

a block supported cap, a source of power, a clutch intermediate of said source of power and said type carrier, and means actuated by the rotation of said cap block frame to throw said clutch into action, said clutch being thereafter automatically thrown out of action.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES M. SHOURT.

Witnesses:
H. SWANSON,
H. S. JOHNSON.