I. G. CUSHING AND F. C. MUNRO.

PRINTING MACHINE.

APPLICATION FILED JULY 15, 1916.

1,305,778.

Patented June 3, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

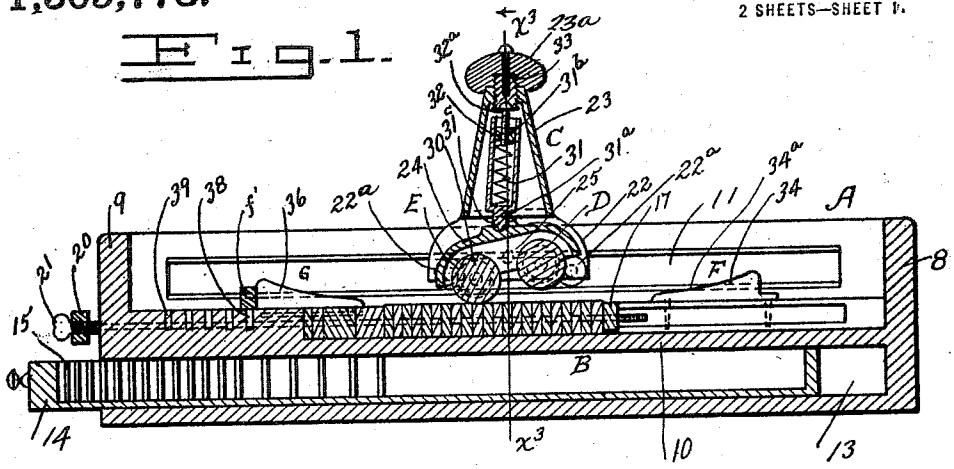


Fig. 3.

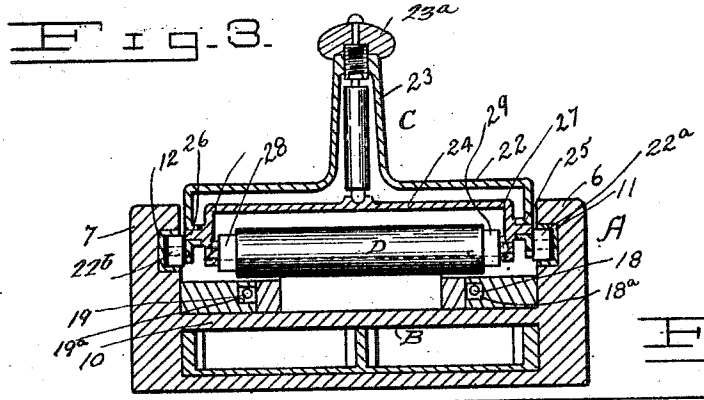
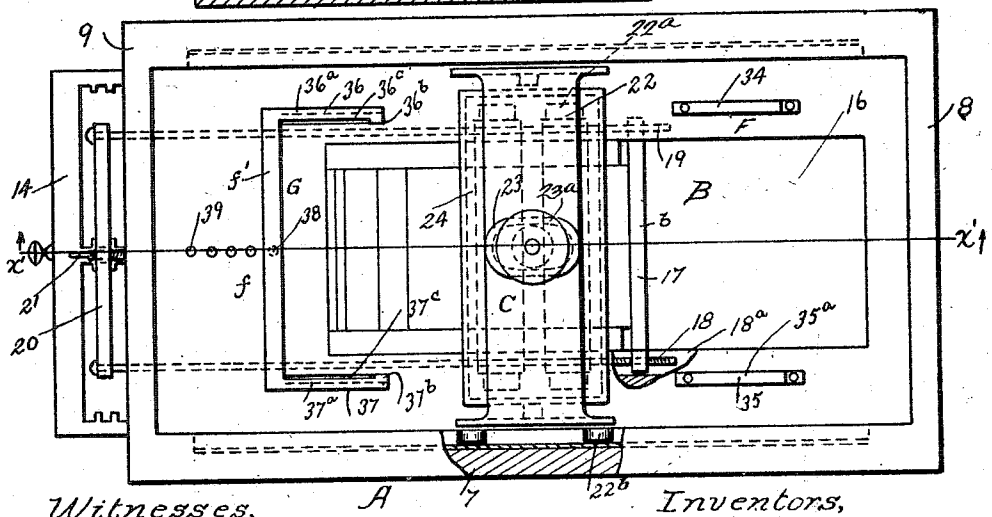


Fig. 2.



Witnesses,
H. Gearing.
Alfred H. Daehler

Inventors,
John G. Cushing,
Fred C. Munro.
By Raymond Brett Blakeslee,
Their Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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2 SHEETS—SHEET 2.

Fig. 4.

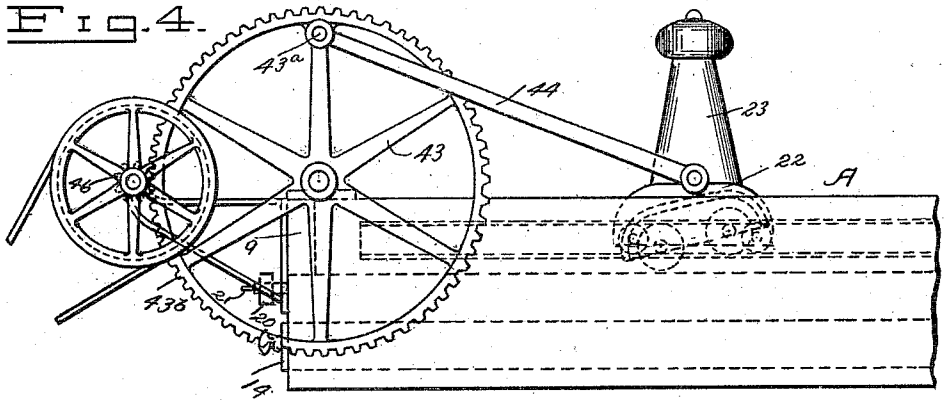
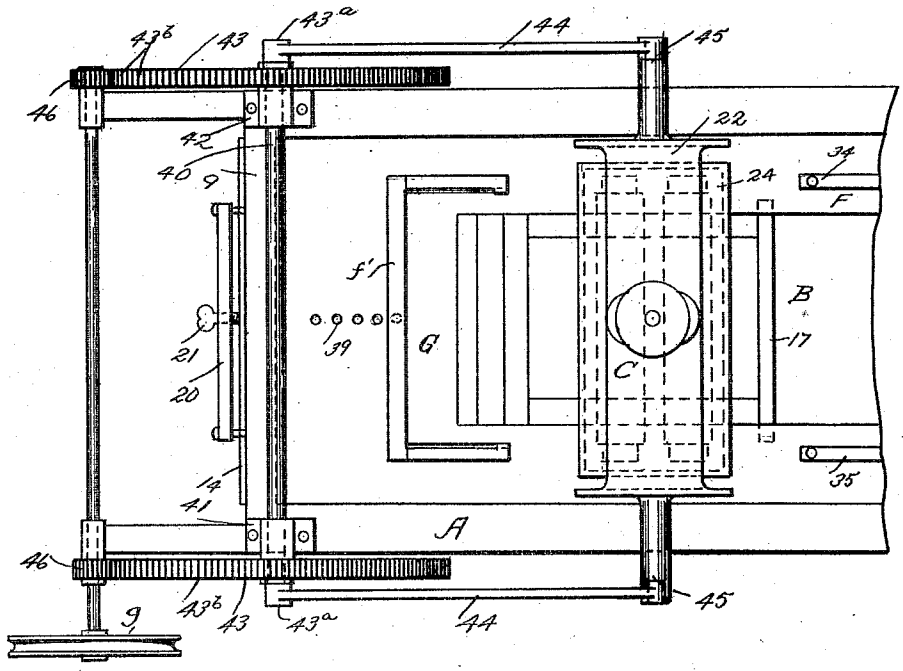


Fig. 5.



Witnesses,
H. Gearing
Alfred H. Dachler

Inventors,
John G. Cushing,
Fred C. Munro,
By Reynolds Dachler & Schaffer,
Their Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN G. CUSHING, OF LOS ANGELES, AND FRED C. MUNRO, OF LONG BEACH, CALIFORNIA.

PRINTING-MACHINE.

1,305,778. Specification of Letters Patent. Patented June 3, 1919.

Application filed July 15, 1916. Serial No. 109,482.

To all whom it may concern:

Be it known that we, JOHN G. CUSHING and FRED C. MUNRO, both citizens of the United States, residing, respectively, at Los Angeles, in the county of Los Angeles and State of California, and at Long Beach, county of Los Angeles, and State of California, have invented new and useful Improvements in Printing-Machines, of which the following is a specification.

This invention relates to printing machines and has for its object to provide an improved printing machine whereby menu cards, letter-heads and bills, and in fact all like matter may be conveniently printed and in which the subject matter to be printed thereon may be readily set up or changed. A particular instance where the machine will be found useful will be in the printing of menu cards and the like which are changed frequently, as the type may be furnished in interchangeable lines so that in setting up the type for the work even unskilled help may be employed.

In accordance with the invention a type bed is provided over which a compression roller is adapted to be reciprocated, inking means being provided and further means being provided to automatically move the compression roller away from the type so that in the reciprocation of such roller it will travel in one direction in the clear and in the other direction in position to press the sheet of paper or other material being printed against the type or otherwise cause an impression to be made. Simultaneously with the positioning in the clear of the compression roller, the inking means may be brought into the plane of the type to ink the same and such inking means will likewise be withdrawn from such plane when the compression roller is again moved into impression-making position. The invention further contemplates the provision of improved means for binding the type in the form or frame where they are held in position in the machine. The reciprocatory part or parts of the machine may be either manually reciprocated or power may be applied to the same if desired.

A further object of the invention is to provide a machine of the general character stated which will be relatively simple and inexpensive in construction and organization, when its other features of superiority in ease of manipulation and general efficiency are considered.

With the above and other objects in view the invention consists in the novel and useful provision, formation, construction, combination, association and relative arrangement of parts, members and features, all as hereinafter described, shown in the drawings and finally pointed out in claims:

In the drawings:

Figure 1 is a central vertical longitudinal sectional view taken on the line x^1—x^1, Fig. 2, and looking in the direction of the appended arrows, of a printing machine constructed and organized in accordance with the invention;

Fig. 2 is a plan view of the machine shown in Fig. 1;

Fig. 3 is a transverse vertical sectional view taken on the line x^3—x^3, Fig. 1, looking in the direction of the appended arrows;

Fig. 4 is a fragmentary side elevation of the machine shown in Figs. 1, 2 and 3, the same being shown in this figure as equipped with power means for operating the same; and

Fig. 5 is a fragmentary plan view of the showing in Fig. 4.

Corresponding parts in all the figures are designated by the same reference characters.

Referring with particularity to the drawing, in the embodiment of the invention therein shown, A designates the frame-work of a printing machine, B designates the type bed, C designates a reciprocatory frame, D designates a compression roller, E designates inking means, F designates means for throwing the compression roller D out of operative position, and G designates means for throwing the compression roller D into operative position. The frame A is shown as a box-like structure, comprising side walls 6 and 7, end walls 8 and 9, and a horizontal wall 10 in which the type bed B is formed. In the side wall 6 a guide-way 11 is provided, and such guide-way 11 may consist of a length of channel section metal embedded in the side wall 6 and ranging longitudinally thereof. The side wall 7 is likewise provided with a guide-way 12, which may consist of a length of channel

section metal embedded in such wall 7 and ranging longitudinally thereof; such guideways 11 and 12 being adapted to constrain the reciprocating frame C to movement in a plane over the type bed. The lower portion of the frame A may be formed into a compartment adapted to receive the type, as by extending the walls 6, 7 and 8 downwardly past the type bed B and providing a bottom wall 13 a suitable housing for a type-receiving drawer 14 is formed. The drawer 14 is preferably provided with transverse partitions 15 between which the lines of type shown may be stored.

The type bed B is formed on the horizontal wall 10, as by forming a rectangular depression 16 therein. The lines of type, which may be made on any standard linotype machine, are blocked into position in the rectangular depression with the type faces up, and through simple means shown at *b* may be readily tightly clamped or released. Such means *b* preferably comprises a clamping bar 17, a link 18, a link 19, an equalizing bar 20 and a thumb screw 21 passed through the equalizing bar and adapted to be threaded therethrough to draw the equalizing bar, links 18 and 19, and the clamping bar 17 taut. The link 18 is housed in a groove 18^a provided in a side wall of the rectangular depression 16, and the link 19 is housed in a groove 19^a provided in the opposite side wall of the rectangular depression 16 and such links extend through the end wall 9 of the frame-work A for connection with the equalizing bar 20. The thumb screw 21 may abut against the end wall 9 as the screw is rotated to tighten the clamping bar 17 and thereby securely hold the type in position.

The reciprocatory frame C is shown as ranging transversely of the frame-work A and comprises a body portion 22 and a handle portion 23 whereby the body portion 22 may be reciprocated. The body portion is provided at one end with a pair of rollers 22^a taking into the guideway 11, and at the other end with a pair of rollers 22^b taking into the groove or guideway 12, thus constraining the frame C to a path of movement in a plane above the type as hereinbefore recited. In the body portion 22 is pivotally mounted an oscillatory sub-frame 24 as by pivots 25 and 26. The compression roller D which may be of any suitable material, is journaled in the sub-frame 24 at one side of the pivotal axis of such sub-frame, as at 27, and such roller is reduced in diameter adjacent each end as at 28 and 29, such reduced portions being of harder material than the working surface of the roller. At the opposite side of the pivotal axis of the sub-frame 24 and in such sub-frame is rotatably journaled a roller 30 constituting the inking means E. A compression spring 31 is provided in the hollow handle 23 and acts against the head 31^a of a cylinder 31^b and against a piston 32 disposed in the cylinder 31^b. The cylinder head 31^a is provided with a rounded terminus as at 31^c, a seat for such rounded terminus being formed in the sub-frame 24 immediately above the pivotal axis of such sub-frame. The piston 32 is provided with a projecting screw head 32^a against which bears an adjustable bushing 33 threaded into the handle 23. By reference to Figs. 1 and 3 it will be seen that this arrangement of spring, cylinder, piston and attendant features will prevent the sub-frame 24 from remaining in a horizontal plane, as the compression spring will cause the lowering of either the compression roller D or the inking means E according to the positioning of such roller D or means E by the means F or G. A hand grip 23^a completes the handle 23. The means F for throwing the compression roller D out of operative position, that is out of the plane of the faces of the type, is shown as comprising a cam 34 mounted on the horizontal partition 10 in the path of movement of the reduced portion 29 of the roller D, and a cam 35 mounted on the horizontal partition 10 and in the path of the reduced portion 28 of the roller D. These cams 34 and 35 are curved at their upper faces 34^a and 35^a, respectively, so that the roller D will be lifted sufficiently high to throw the sub-frame 24 into inking means presenting position, upon the completion of a stroke of the reciprocating frame C in one direction.

The means for throwing the compression roller D into operative position, preferably comprises a cam 36, a cam 37, and means *f* for adjusting such cams 36 and 37. The upper face 36^a of the cam 36 is disposed in the path of travel of one of the reduced ends of the inking roller 30, it being understood that such roller 30 is provided with end portions of reduced diameter the same as is the roller D, and the top face 37^a of the cam 37 is disposed in the path of the other reduced end portion of the inking roller 30 so that upon completion of a stroke of the frame C in the direction of the means G, the inking roller 30 will be raised and the compression roller D will be lowered to operating position, the compression spring 31 serving to hold the compression roller in such operating position. The adjusting means *f* may comprise a bar *f'* uniting the cams 36 and 37 and provided with a pin 38, and a series of holes 39 provided in the horizontal wall 10 and into which the pin 38 is adapted to take. The cam 36 is provided at its forward end with a hook 36^b taking into a slot 36^c provided in the horizontal wall 10, and the cam 37 is provided with a hook 37^b taking into a slot 37^c provided in the

horizontal wall 10. This hook and slot arrangement permits adjustment of the means G.

The power operating means shown in Figs. 4 and 5, may consist of a shaft 40 attached to the frame A by securing thereto suitable journal bearings 41 and 42, a pair of crank disks 43, one of such disks being secured at each end of the shaft 40, crank pins 43^a on the disks 43, connecting rods 44 one for each crank disk 43, wrist pins 45 one applied to each side of the frame C, and a shaft and pulley device g adapted to be belt driven and apply power to the crank disks 43 through the teeth of pinions 46 provided on the shaft and pulley device and meshing with teeth 43^b provided on the crank disks 43.

The operation, method of use and advantages of the improved printing machine will be readily understood from the foregoing description, taken in connection with the accompanying drawings and the following statement:

Upon movement of the frame C to the limit of its travel in the direction of the means F, the cams 34 and 35 of such means F will, through contact with the reduced portions of the roller D, tilt the sub-frame 24 so that the inking roller will be brought into the plane of the type faces, the compression spring 31 maintaining the frame 24 in this position until the frame C has been moved sufficiently in the other direction of its travel, whereupon the cams 36 and 37 of the means G will cause, through contact with the reduced portions of the roller 30, the frame to be tilted oppositely, that is with the inking roller raised and the compression roller D in operative position in the plane of the type faces. It will thus be seen that when the frame C has been moved over the faces of the type it will be automatically set for the return stroke, either to ink the type or to bring the compression roller into operative position, according to the direction of motion. Starting with the compression roller in elevated position over the means F and the inking roller in working position, movement over the faces of the type by the frame C will cause the inking roller to deposit ink thereon and as the means G will be adjusted to contact with the reduced end portions of the inking roller immediately after traverse of all of the type by the inking roller, the inking roller will be raised gradually until the limit of travel over the means G has been reached, when the inking roller will be in elevated position and the compression roller in depressed, working position. Before the return stroke of the frame C a card, sheet of suitable material, or other object to be printed is placed over the type and the same will be pressed against the type when the return stroke of the frame is made as the compression roller passing over successive areas of the object to be printed will press the same into intimate contact with the type, the compression spring 31 applying the required pressure. As the spring 31 is adjustable it will be seen that the desired degree of pressure for any particular work may be obtained. Upon completion of the printing stroke just described, the printed card or other object may be removed, and the compression roller having been raised by the means F with the corresponding lowering of the inking roller, the cycle just described may be repeated. The handle portion of the frame C forms a suitable grip whereby the reciprocations of the frame C and the features carried thereby may be manually caused. When it is desired to actuate or operate the printing machine by power, the power shaft and attendant features described in connection with Figs. 4 and 5 may be supplied. With a small stock of the lines of type shown in position in the type bed, menu cards and the like may be printed in great variety from day to day or as required, this class of work being but an instance of the many uses which may be made of the machine by persons unskilled in the printing art.

It is manifest that changes and variations may be made in departure from the construction and inter-relation of parts and features shown in the drawings and hereinabove described, without departing from the spirit of the invention or the terms of the following claims:

Having thus disclosed our invention, we claim and desire to secure by Letters Patent:

1. In a printing machine, the combination with a type bed, a reciprocating carriage mounted to move over the type bed, inking means carried by the carriage, impression means carried by the carriage, means permitting the alternate movement of the impression means and inking means into operative position, and a spring arranged to yieldably hold either the impression means or the inking means in operative position at all times.

2. In a printing machine, the combination with a type bed, of a reciprocating carriage movable over the type bed, an oscillating frame mounted upon the carriage, an impression roller carried by the frame, an inking roller carried by the frame, trip means for rocking the oscillatory frame to move the impression roller and inking roller alternately into operative position, and a spring acting upon the oscillatory frame to hold one of the rollers at all times yieldably in operative position.

3. In a printing machine, the combination with a type bed, of a reciprocating carriage mounted to move over the type bed, an os-

cillatory frame pivotally mounted upon the carriage, an impression roller and an inking roller mounted upon the oscillatory frame on opposite sides of the pivot thereof, means for swinging the oscillatory frame to move the impression roller and inking roller alternately into operative position, and a spring interposed between the oscillatory frame and the carriage and engaging the frame at a point above the pivot thereof so that the spring will act upon opposite sides of the pivot as the frame is rocked and hold one of the rollers at all times yieldably in operative position.

4. In a printing machine, a type bed, a reciprocating carriage mounted to move over the type bed, an oscillatory frame pivotally mounted upon the carriage, an impression roller and an inking roller carried by the frame on opposite sides of the pivot thereof, a spring interposed between the carriage and the frame and engaging the latter at a point above the pivot thereof so that it will act on opposite sides of the pivot as the frame is rocked and hold one of the rollers at all times yieldably in operative position, a barrel receiving the spring, and an abutment adjustable within the barrel to regulate the tension of the spring.

5. In a printing machine, the combination with a type bed, a reciprocating carriage mounted to move over the type bed, an impression roller, and an inking roller carried by the carriage, means for alternately moving the impression roller and inking roller into operative position, a spring acting at all times to hold one of the rollers yieldably in operative position, a barrel housing the spring, and an abutment adjustable within the barrel for regulating the tension of the spring.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOHN G. CUSHING.
FRED C. MUNRO.

Witnesses:
ALFRED H. DAEHLER,
WILLIS S. MITCHELL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."