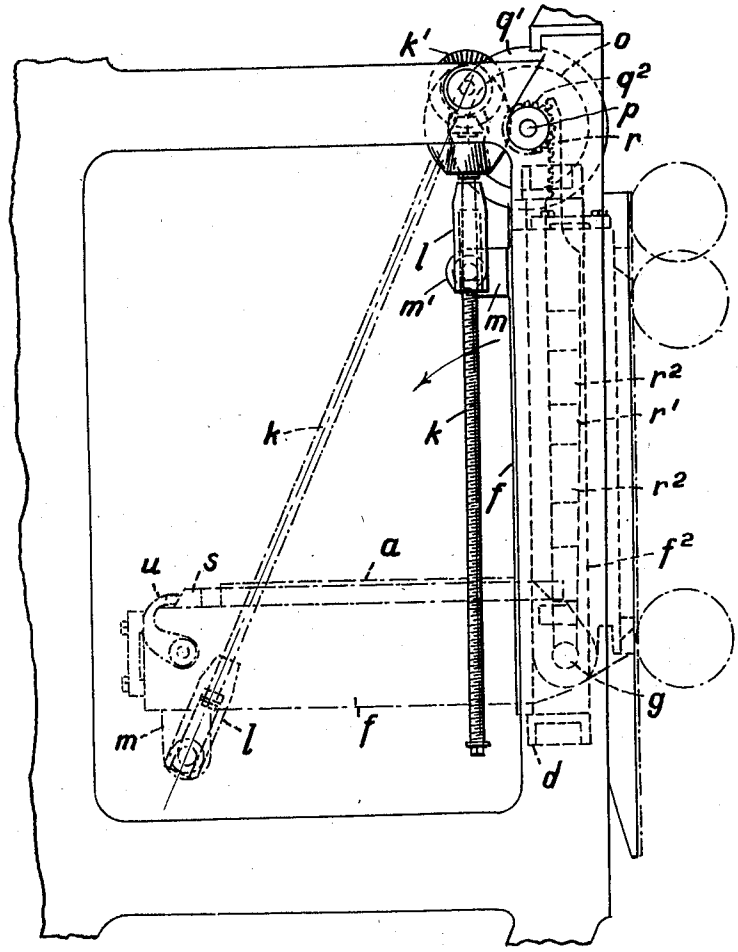
March 29, 1932. F. FALLERT 1,851,089

ROTARY PRINTING MACHINE WHICH PRINTS FROM A FLAT TYPE FACE

Filed May 14, 1928 3 Sheets-Sheet 1

Fig. 1.



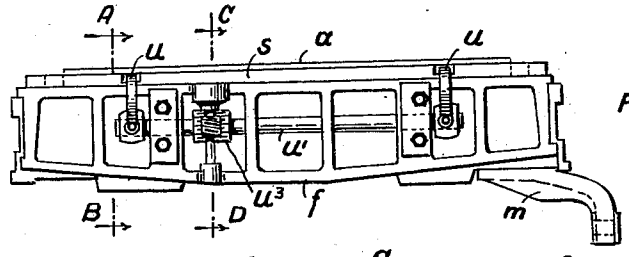


Fig. 4.

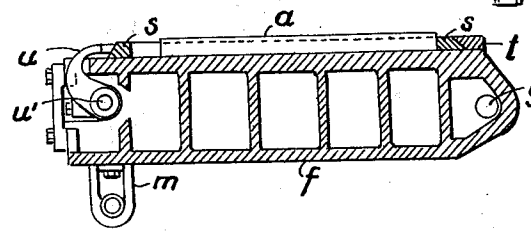


Fig. 5.

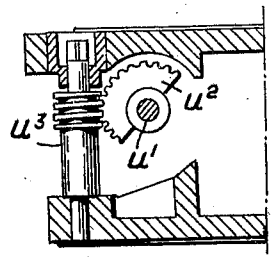
INVENTOR:
F. Fallert.
By
Langner, Parry
Card & Langner
Attys.

March 29, 1932. F. FALLERT 1,851,089

ROTARY PRINTING MACHINE WHICH PRINTS FROM A FLAT TYPE FACE

Filed May 14, 1928 3 Sheets-Sheet 2

Fig. 6.



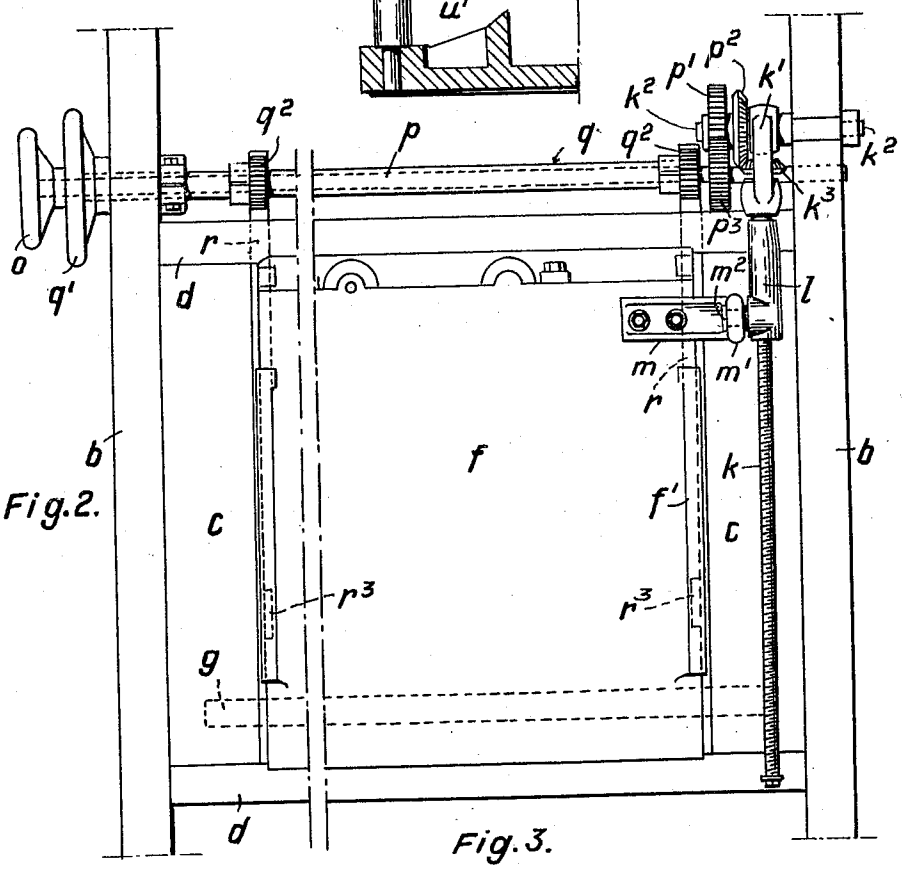
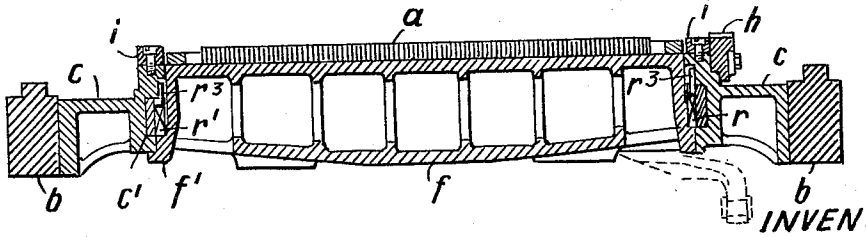


Fig. 2.

Fig. 3.



INVENTOR:
F. Fallert
By Langner, Parry, Card & Langner
Attys

March 29, 1932. F. FALLERT 1,851,089

ROTARY PRINTING MACHINE WHICH PRINTS FROM A FLAT TYPE FACE

Filed May 14, 1928 3 Sheets-Sheet 3

Fig. 7.

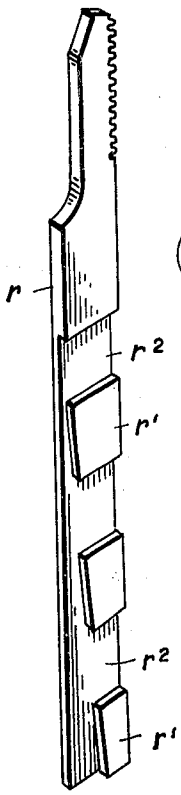


Fig. 8.

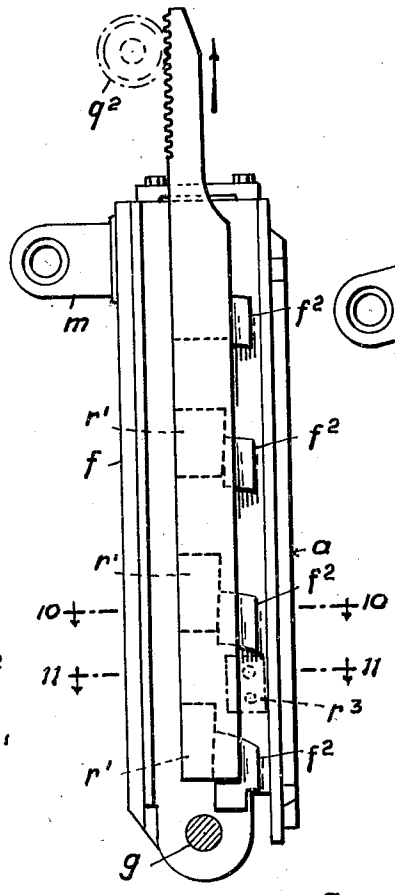


Fig. 9.

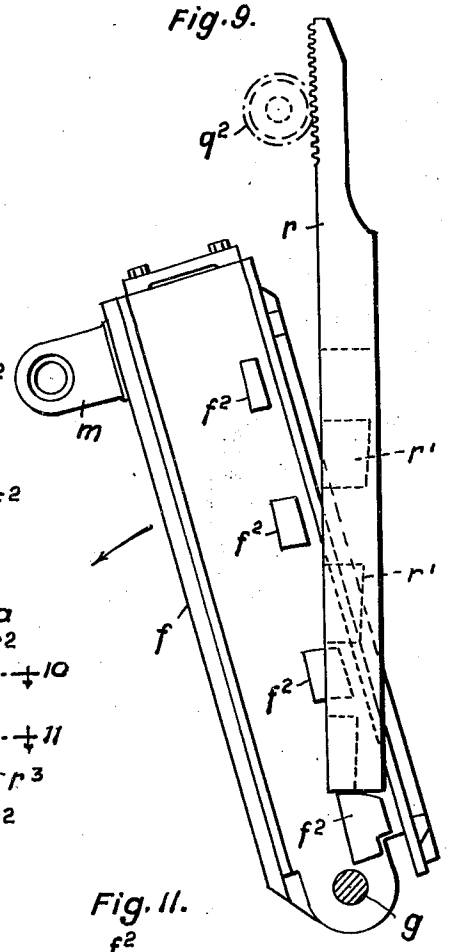


Fig. 10.

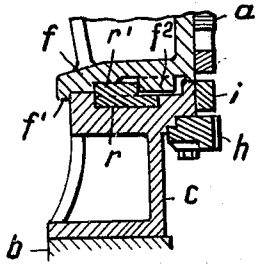
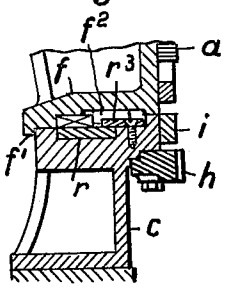


Fig. 11.



Inventor:
Fritz Fallert
By Langner, Parry, Card & Langner
Attys.

Patented Mar. 29, 1932 1,851,089

UNITED STATES PATENT OFFICE

FRITZ FALLERT, OF BERN, SWITZERLAND

ROTARY PRINTING MACHINE WHICH PRINTS FROM A FLAT TYPE FACE

Application filed May 14, 1928, Serial No. 277,747, and in Germany May 20, 1927.

The present invention relates to a rotary printing machine which prints from a flat type face.

Machines of this kind are known in which the type forms are arranged vertically and cooperate with "perfecting"- and counter-printing cylinders which are located in a reciprocating carriage. In machines of this kind having vertical type forms it is difficult to bring the type forms into operative position and it is also difficult to inspect the said forms when the same have been fixed in their beds.

These disadvantages are overcome by the arrangement according to the present invention which essentially consists in the provision of a device by means of which the type form together with the type form bed can be brought into a horizontal position, so that the type form can easily be inspected, inserted into or removed from the type form bed. In order to obtain this effect the entire type form bed and an auxiliary device are made tiltable or swingable and the said device effects forcibly the adjustment in both end positions. Hereby the type form bed is safely locked in the working position and keeps the type form in a fixed vertical position relatively to the reciprocating "perfecting"- and counter-printing cylinders.

A constructional form of the invention is shown by way of an example in the accompanying drawings in which

Fig. 1 is a partial view of a rotary printing press according to the invention. The horizontal position of the type form bed is indicated by means of dot-and-dash lines and the vertical position is shown in dashed lines.

Fig. 2 shows the arrangement seen from behind with the driving mechanism and with the type form bed in operative position. To facilitate the understanding of the invention inessential parts of the machine have been removed.

Fig. 3 is a cross sectional view of the device shown in Fig. 2.

Fig. 4 is a lateral view of the type form bed and illustrates the locking arrangement of the type form.

Fig. 5 is a sectional view taken after the line A—B in Fig. 4.

Fig. 6 is a partial sectional view taken after the line C—D in Fig. 4.

Fig. 7 is a perspective view showing one of the wedge bars by means of which the bed plate is locked.

Fig. 8 is a lateral view of the bed plate with the wedge bar in locking position.

Fig. 9 is a lateral view of the same parts with the bed plate swung out laterally and the wedge bar in raised position.

Fig. 10 is a horizontal sectional view taken substantially after the line 10—10 in Fig. 8 and through also showing the adjacent parts of the frame.

Fig. 11 is a horizontal sectional view taken substantially after the line 11—11 in Fig. 8 and also showing the adjacent parts of the frame.

The machine frame is, in the manner of the usual printing machines which print from a flat type face, arranged in such a manner that the type forms are situated vertically on both sides of the reciprocating printing cylinders. As both sides of the machine are exactly alike, only the left side of the same is shown in Fig. 1. *a* denotes a type form, which according to the invention is arranged on a swingable bed. It would be possible to equip the bed with a perpendicularly arranged shaft and to swing out the bed laterally but it is more advantageous to connect the said bed with a horizontal shaft and to swing out the bed into a lateral position on the rear side of the upstanding machine carrying the said bed. The machine comprises a frame in which the type form bed fits snugly and with which it is locked. As will be seen from the Figures 3 and 4 the frame which surrounds the type form bed is fixed by means of screws between the standards *b* and the machine. The frame consists substantially of vertical lateral parts *c* and of substantially horizontal upper and lower parts *d* which together with the first mentioned parts *c* are fastened to the machine standards by means of screws.

The vertical frame parts *c* also serve as bearings for the shaft *g* of the type form bed *f* (Figs. 1 and 3). The cross sectional form of the said bed is clearly shown in Fig. 3.

The side of the bed facing the printing cylinder is equipped with a plane face which serves as seat for the type form a and to which this form is fastened. The rear edges of the bed f are formed with lateral flanges f^1 which will abut against the outer frame when the bed is inserted into the same, so that the bed is kept in operative position during the printing operation and an exact adjusting of the type form a is made possible.

The frame also carries such parts of the machne which in this specification are not described specially, for instance the driving racks h and the guide bars i of the same (Fig. 3). This arrangement involves that these driving means are not influenced when the bed f is swung up and down.

On both sides of the machine the movements of the said bed are effected mechanically by means of a threaded spindle arrangment comprising a spindle k which forcibly swings the type form bed out of and into operative position. The spindle k is at one end pivotally connected to the machine in such a manner that it can be adjusted relatively to the type form bed, in that the spindle, on the side of the machine opposing the operator's side, is connected to a pivot k^2, which for instance may be located in a bore in one of the standards b. In the constructional form of the invention shown in the drawings the upper end of the spindle is connected in such a manner to a head piece k^1, that it can be rotated but not axially displaced within the same. This head piece or sleeve k^1 is directly connected to the pivot k^2. The upper end of the spindle k carries a bevel gear k^3 the operation of which will be described in the following specification. The spindle k further carries a guide sleeve l which is internally threaded and which is pivotally connected to the upper end of the type form bed, in that the said bed is equipped with a bracket or arm m and a laterally projecting pivot on the sleeve l is taken up by a bearing-shaped part m^1 of this bracket. According to another constructional form of the invention a pivot on the bracket m projects into a bore in the threaded sleeve l. A threaded plate m^2 keeps the pivot in position in the bearing m^1. It will thus be understood that the sleeve l is pivotally connected to the type form bed and forms a threaded guide in which the spindle k is rotating during the upward and downward movements of the type form bed f. An inspection of the drawings especially of Fig. 1 will make it clear that when the spindle k is rotated the sleeve l will ascend or descend on the same in accordance with the direction in which the spindle is rotated. Hereby the part of the spindle k between the sleeve l and the head piece k^1 will be lengthened or shortened and the inclination of the spindle k will change according as the pivot of the sleeve l is turned in its bearing m^1. When the spindle k is rotated the sleeve l and the type form bed will thereupon be swung upward or downward about the shaft g.

In the constructional form of the invention shown in the accompanying drawings the threaded spindle k is operated by means of a gear mechanism. The lengthened pivot k^2 carries a gear p^1 which is rigidly connected to a bevel gear p^2, which meshes with the bevel gear k^3 on the spindle k. The gear p^1 meshes with a spur gear p^3 which is fastened to the shaft p. This shaft is supported by the machine standards b and carries at its free end a hand wheel o or a suitable lever.

When the hand wheel o and the shaft p are rotated the rotation is by means of the spur gear p^1 and p^3 transmitted to the bevel gear p^2 and to the bevel gear k^3 which again transmits the rotation to the spindle k, whereby the sleeve l is moved upward or downward on the spindle k and the type form bed is moved into or out of operative position.

The bed plate f may for instance be locked in operative position at both sides by means of wedge bars r (Figs. 7, 8, 9), which can be shifted in vertical direction in the sides of the frame c and which are formed with alternating projections r^1 and gaps or slots r^2. In one position of the said wedge bar the bed f will be released and in another position it will be locked. The wedge bars r are arranged in such a manner in parallel guide slots c^1 in the frame members c on both sides of the type form bar, that they can be displaced or shifted in vertical direction. The conical projections r^1 project into the bed f, which is formed with corresponding conical guides and with open intermediate spaces through which the projections r^1 are moved (Figs. 1, 8, 9, 10). The wedge bars r^1 are conically widened in upward direction and cooperate in such a manner with correspondingly formed conical projections f^2 on the type form bed, that the said bed is locked to its frame when the wedge bars r are forced downward. The side of the wedge bars facing the type form bed comprises projections and slots, which are located in such a manner relatively to the corresponding projections f^2 in the bed f, that the projections in the wedge bars will face the intermediate spaces between the projections f^2 in the bed f when the wedge bars are forced upward, i. e. out of locking position, so that the type form bed will be released and can be swung downward.

When the type form bed has been brought into operative position by means of the hand wheel o and the spindle k the wedge bars are lowered by means of a driving mechanism, whereby the conical projections of the bars will slide along the conical projections f^2 (Fig. 8) and the type form bed will be drawn

into the frame until the flange f^1 abuts against the member c. The raising and lowering of the wedge bars is effected by means of a hand wheel q^1, which is fixed to the hollow shaft q, surrounding the shaft p (Fig. 2). On the hollow shaft q toothed segments or wheels q^2 are arranged, which cooperate with rack-like upwardly directed parts of the wedge bars r. When the gears q^2 are rotated by means of the hand wheel q^1 and the shaft q the wedge bars will be lowered or raised whereby the type form bed will be locked or released.

In order to prevent the wedge bars from dropping out of their guides c^1, retaining plates r^3 (Figs. 8, 11) are provided which partly cover the wedge bars r.

The type form a is fastened in a manner known per se by means of a closing frame s, the upper and lower edges of which are inclined in known manner. The lower edge of the closing frame rests in a list or ledge t, which is fixed to the bed f by means of screws or the like and the upper edge is held in position by means of clasps u, which press the type form against the list t. The clasps u are arranged on a common shaft u^1, which is located in the type form bed and carries a worm gear u^2, which intermeshes with a worm u^3. This worm u^3 is arranged perpendicularly to the axis of the shaft u^1. The said worm u^3 can be rotated in the type bar bed, but can not be axially displaced. The adjustment of the worm is effected by means of a key or the like (Figs. 5 and 6).

It will be evident that the type form can be easily and securely fastened to the type form bed simply by rotating the worm u^3 and the shaft u^1 in such direction, that clasps u are pressed against the frame s. When the said parts are rotated in the opposite direction the type form is again released.

The type form bed is preferably also made adjustable relatively to the printing cylinders in such a manner that the type form can be moved nearer to the printing cylinders when the surface at the type form is worn off. This can be effected by known means, for instance by arranging the ends of the shaft in blocks which are displaceably arranged in the members c.

I claim:—

1. A rotary printing machine printing from flat type faces and comprising in combination, a vertically arranged type form, a bed for said type form pivotally arranged on a horizontal shaft and means for swinging the said type form bed out of and into operative positions, comprising a threaded spindle pivotally connected to a stationary part of the machine, a threaded sleeve like nut on said spindle, and a pivotal connection between said nut and the type form bed.

2. A rotary printing machine printing from flat type faces and comprising in combination, vertically arranged type forms, beds for said type forms pivotally arranged on horizontal shafts, a mechanism for swinging said type form beds out of and into operative position, frames surrounding said type form beds, means for operating the said mechanism, and other means for locking said type form beds to their frames and comprising vertically displaceable wedge bars formed with projections and slots and cooperating projections and slots on the said type form beds.

3. A rotary printing machine printing from flat type faces and comprising in combination, vertically arranged type forms, beds for said type forms pivotally arranged on horizontal shafts, a mechanism for swinging said type form beds out of and into operative position, means for operating the said mechanism, and other means pivotally arranged on a common shaft and serving for detachably fastening the type forms to their beds.

4. A rotary printing machine printing from flat type faces and comprising in combination, vertically arranged type forms, beds for holding said type forms, substantially horizontal shafts for said type form beds, and means for moving the type forms nearer to the printing cylinders when the surface of the said type forms has been worn.

5. A rotary printing machine printing from flat type faces and comprising in combination, a machine frame having substantially horizontal and vertical members, standards carrying said frame members, a vertically arranged type form, a bed for said type form pivotally arranged on a horizontal shaft and means for swinging said type form bed out of and into operative positions, comprising a pivot, horizontally arranged in a stationary part of the machine, a head piece pivotally arranged on said pivot, a threaded spindle, one end of said spindle being rotatably but not axially displaceably arranged in said head piece, a threaded sleeve like nut on said spindle, a pivotal connection between said nut and the type form bed, a substantially horizontal shaft arranged in stationary parts of the machine, a gear connection between said shaft and the upper end of said threaded spindle and means for rotating said shaft in order to rotate said spindle and swing said type form bed out of and into operative position.

6. A rotary printing machine printing from flat type faces and comprising in combination, vertically arranged type forms, beds for said type forms pivotally arranged on horizontal shafts, a mechanism for swinging said type form beds out of and into operative position, frame members surrounding said type form beds, standards supporting said frame members, means for operating the said mechanism and other means for locking said type form beds to their frames

and comprising vertically displaceable wedge bars formed with projections and slots, cooperating projections and slots on the said type form beds, rack-like parts on the upper ends of said wedge bars, a substantially horizontal shaft arranged in stationary parts of the machine, gears on said shaft adapted to cooperate with said rack-like parts and still other means for rotating said shaft.

Signed at Bern (Switzerland) in the county of Bern this third day of May A. D. 1928.

FRITZ FALLERT.