

(No Model.)

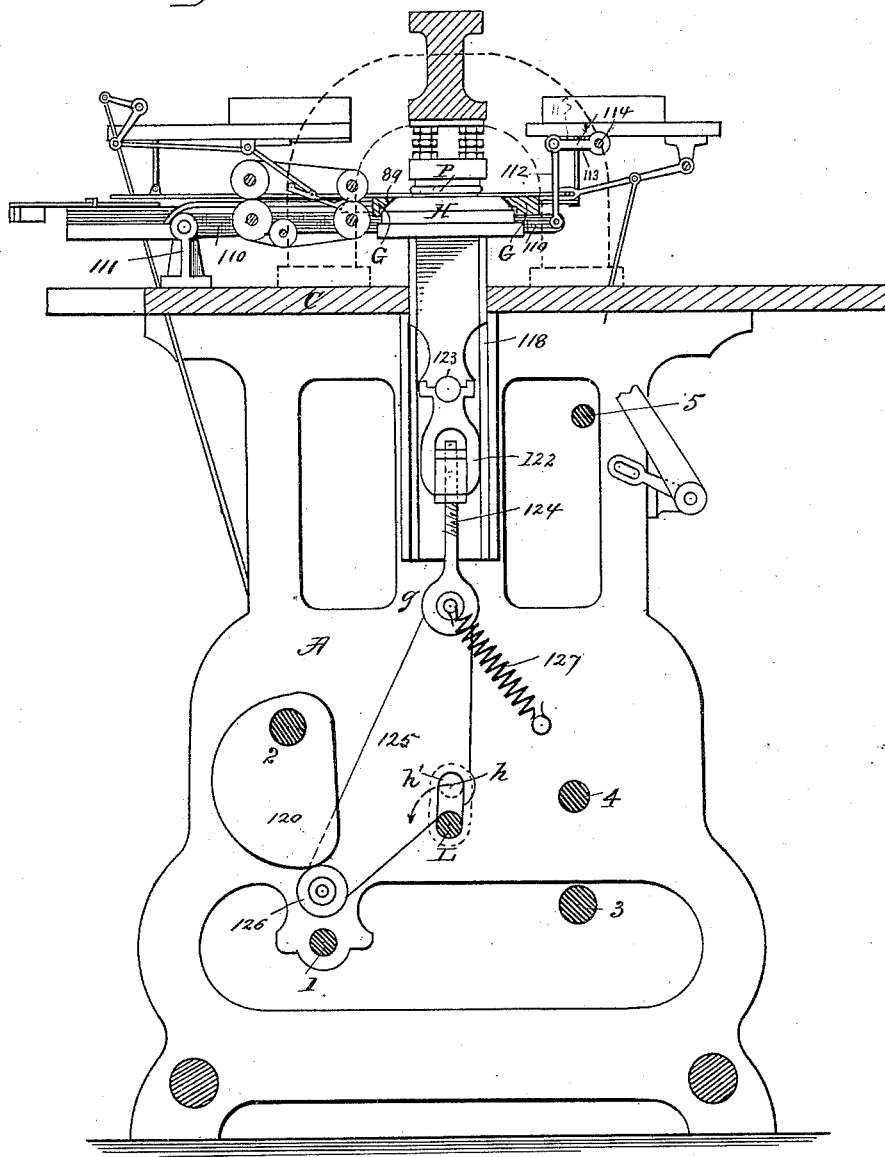
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C. H. HEYWOOD.
PRINTING MACHINE.

No. 422,883.

Patented Mar. 4, 1890.

Fig. 1.



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(No Model.)

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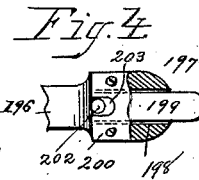
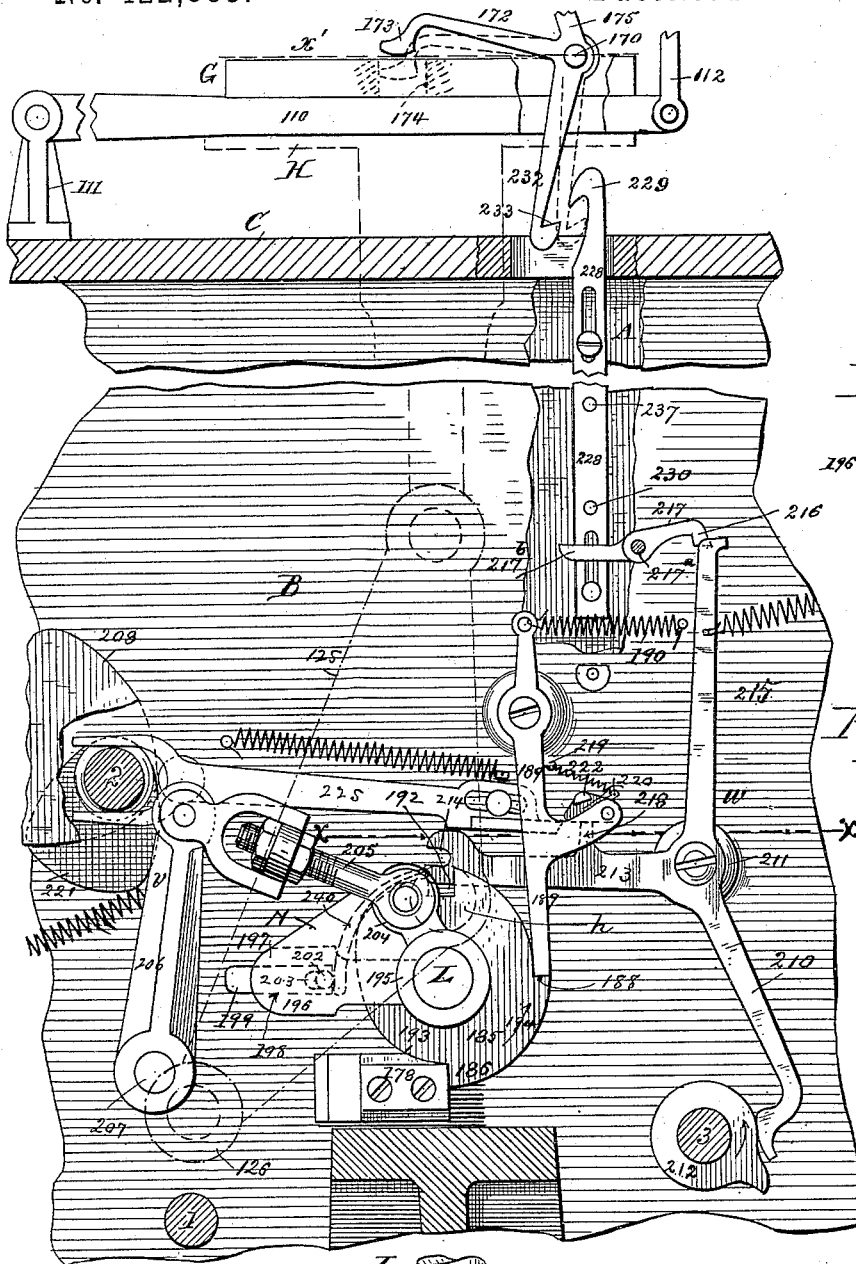
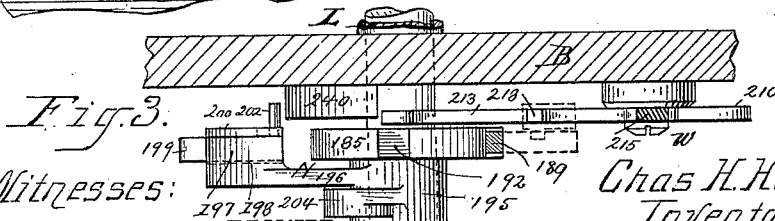


Fig. 2



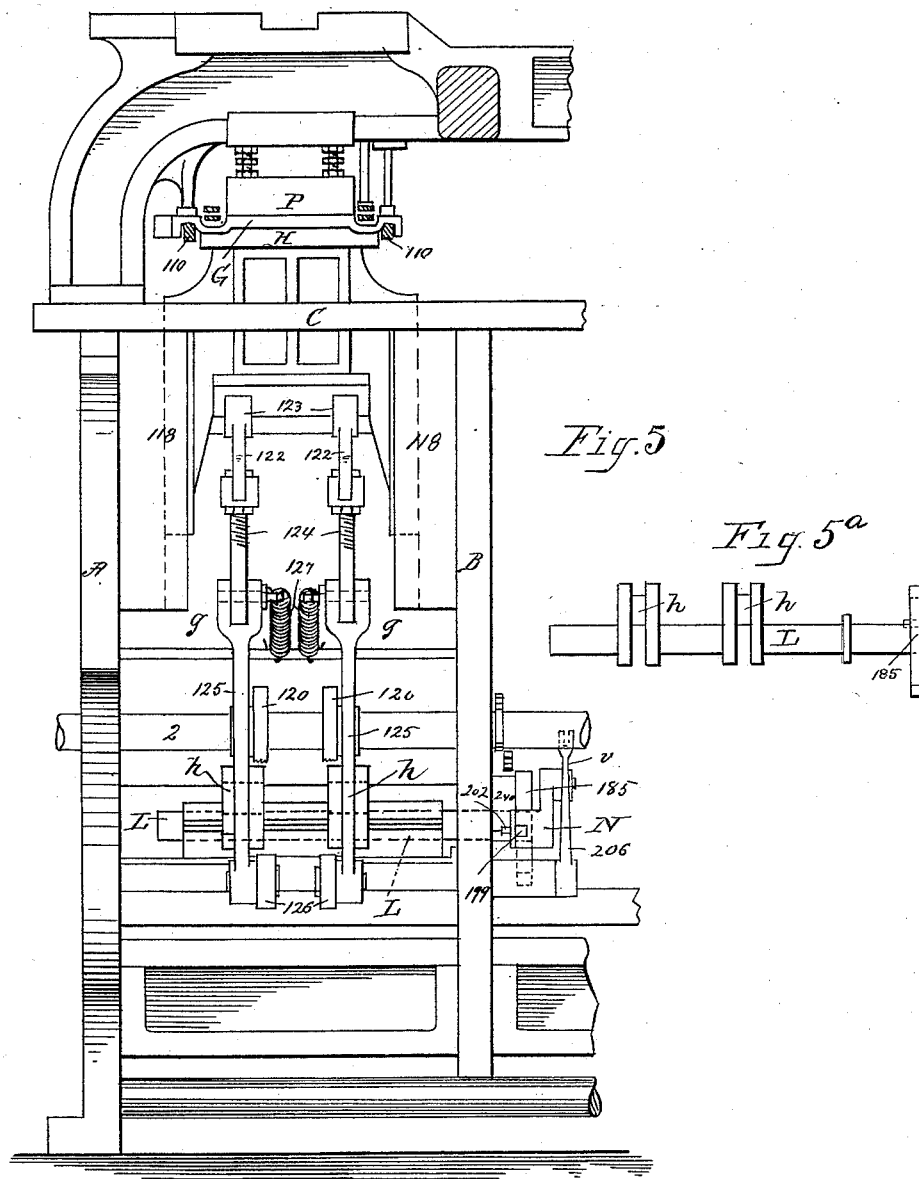
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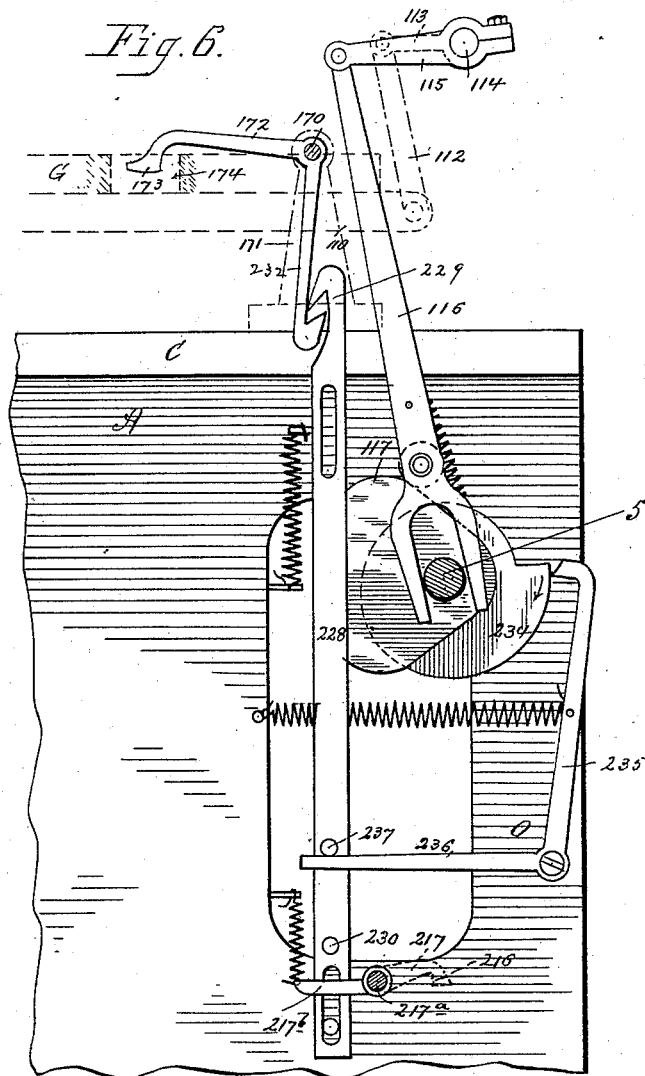
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UNITED STATES PATENT OFFICE

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PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 422,883, dated March 4, 1890.

Application filed October 4, 1889. Serial No. 326,036. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. HEYWOOD, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Printing-Machines, of which the following is a specification.

This invention relates to printing-machines, the object thereof being to provide a mechanism that is controlled by the presence or non-presence of a paper sheet or blank on the appliance which is provided for properly supporting the blank relatively to the positions of the printing-bed and platen, that such blank may receive the imprint, and which mechanism acts in conjunction with the actuating mechanism for the printing-bed, whereby in the event of the presence of a blank on said blank-supporting appliance said printing-bed and the type carried thereby will then be projected, as usual, to present its type against the platen, but also whereby in the event of the non-presence of a blank on the supporting appliance the said printing-bed will then be carried to a position only in proximity to and not into contact with the platen; and the invention consists in the construction and combination of parts, all substantially as will hereinafter more fully appear, and be set forth in the claims.

In an application for Letters Patent of the United States for improvements in envelope and printing machines, filed January 14, 1889, Serial No. 296,272, the present improvements in automatic mechanism for the purpose above set forth are illustrated as forming a part of a machine having capabilities for feeding blanks and gumming and printing them and then folding the same into envelopes, and in the accompanying drawings the said mechanism for controlling the projection of the type-bed against or near to the platen is shown in connection with certain parts constituting the supporting-frame and feeding and supporting mechanism for blanks similar to those shown in said application. It will be obvious from the description hereinafter given that the said mechanism may be embodied in various descriptions of printing-machines and in situations relative to feeding and supporting

mechanism for the blanks other than those shown in the accompanying drawings.

In the drawings, Figure 1 is a sectional elevation of a machine, showing the type-bed and the platen, the toggle devices to which the type-bed is affixed, and also showing feeding, guiding, and supporting devices, whereby blanks may be conveyed to and maintained in a position for the reception thereon of the imprint from the type of the type-bed. Fig. 2 is a side elevation of the mechanism which is actuated by the presence or non-presence of a blank on the support therefor for controlling the extent of throw of the vertically-movable printing-bed. The said parts shown in elevation in said Fig. 2 are in planes parallel with but somewhat distant from that in which the parts seen in Fig. 1 are substantially located. Fig. 3 is a horizontal section of parts shown in Fig. 2, as seen below the line *x x* thereon. Fig. 4 is a rear view in partial section of a part seen in Figs. 2 and 3, to be hereinafter termed the "shifter." Fig. 5 is a front elevation of the parts seen in Fig. 1, and as if taken from a point at right angles thereto, there being also shown in said figure some parts of the mechanism shown in Fig. 2, whereby the relative location of said latter-named parts to those constituting the printing-bed and toggle mechanism may be more clearly understood. Fig. 5^a is a detail view of a part of the mechanism which is indicated but not fully shown in Fig. 5, and which is hereinafter particularly referred to. Fig. 6 is a view, in elevation, of mechanism for elevating a gravity-rod which is shown in Fig. 2, and as will be hereinafter more fully described.

The appliance for supporting the blanks one by one to be printed, as shown, consists of a bed G, having an opening 89 therein corresponding to what is termed the "gumming-bed" in my aforesaid application, and said blank-supporting bed G is carried by a pair of parallel arms 110, which at their forward ends are pivoted on standards 111 near the front of the table C, from which they may swing, a regular reciprocating motion being imparted to said bed G in any approved manner, that described in said application con-

sisting of links 112, secured to the rear ends of said arms 110, and radial arms carried on a rocker-shaft 114, and to which arms said links are also connected, said rocker-shaft being also provided with another radial arm 115, which receives its back and forth swinging motion from its connection with a thrust-rod 116, operated by a cam 117 on shaft 5. (See Fig. 6.) The said blank-supporting bed G is formed with a vertical aperture 174 at some place therein, to be overlaid by a blank sheet of paper when the latter is in its proper disposition thereon to be printed.

The printing-bed H is movable in vertical slideways 118 in the standards A B below the table, and at its upper side carries the form and type for printing through the aperture of the bed G upon the middle portion of the blank and against a fixed platen P, supported under the arch-frame of the machine.

A pair of toggles *g g*, operated by cams 120 on the shaft 2, give the rising and falling motion to the type-bed. Each of the duplicated toggle devices consists of the stirrup 122, pivotally connected at 123 to the type-bed and receiving a tension-rod 124, having a screw-thread and set-nut engagement therewith, and a triangular lever 125, which at one end of its hypotenuse line is pivoted to the lower end of the said rod 124, is fulcrumed at its apex, as at *h*, and at its other point is provided with a roller 126, against which the said cam 120 operates to straighten the toggle, a suitable spring 127 causing the doubling of the levers for lowering the type-bed at the proper period.

The mechanism for insuring a controlling and limiting of the upward movement of the printing-bed H by the non-presence of an envelope-blank depends on securing a lowering of the fulcrum-point *h* for the triangular members 125 of the toggle mechanism.

170 represents a horizontal rocker-shaft supported on a standard 171 of the table C, or otherwise maintained, and said shaft carries a radially-extending fixed arm 172, having a downwardly-extending foot 173, which staples over the said aperture 174 in the blank-supporting bed, so that when the said bed rises with a blank thereon the said foot will by said blank be raised and the shaft 170 rocked. A downwardly-extended radial arm 232 is fixed on the rocker-shaft 170, which may be rocked, as just described.

228 represents a gravity-bar capable of a vertical movement within certain limits and guided by any suitable means upon the frame of the machine. Said gravity-bar is hooked at its upper end, as at 229, and is provided toward its lower end with a lateral stud 230 to abut against the forward arm 217^b of the intermediately-pivoted catch, when the said bar is permitted to drop. On the shaft 5 (see Fig. 6) is a snail-cam 234, which operates upon one arm 235 of an angular lever O, its other arm 236 extending forwardly for an engagement with a pin 237 on said gravity-bar. The said

fulcrum-points *h* for the triangular toggle-members 125 are formed by the cranked portions of a horizontal crank-shaft L, mounted in fixed supports of the machine-frame extending between the standards A and B, and also projecting through the one B, receiving at its extension a disk 185, the same being keyed thereon. (See Figs. 5 and 5^a.) The crank-shaft is normally set to present its cranked portions about vertically over its axis, as indicated at *h* in Fig. 1. The shifter-disk has a nose 186 for abutment against a stop-lug 178 on the frame for limiting its swing when carried into its said normal position, and is also provided with another abutment-nose 188 for permitting the engagement and rest thereon of a vertically-disposed locking-lever 189, pivotally hung on the frame, a spring 190 tending to keep said lever in its position of engagement, as shown. The said disk 185 has a notch 192 formed in its upper edge, and its periphery is rabbeted, as at 193, between said notch 192 and its abutment-nose 186, so that the said disk may be partially rotated in the direction of the arrow 194, Fig. 2.

N represents a shifter provided with a hub 195, loosely surrounding the crank-shaft outside of the crank-shaft disk having a radially-extending arm 196, with an extension 197 offset to lie across the vertical plane of said disk and having therein a radial socket 198, in which is disposed a slide-dog 199, held therein by a strap 200, said dog being provided with a laterally-extending pin 202, the outward movement of which on and with said dog 199 is limited by the end of a short slot 203 in said strap. (See Fig. 4.) A regular rocking movement is secured to said shifter N by means of the pivotal engagement with the radially-extending arm 204 thereof of the end of one member 205 of a toggle *v*, the other member 206 thereof being pivotally hung, as at 207, on a stud of the machine-frame, the distending action being imparted to said toggle by a cam 208 on shaft 2 working against the intermediate pivotally-connected part of the toggle, a spring suitably secured to the toggle causing the doubling up thereof when permitted so to do under the rotation of the cam.

w represents a spider-lever having three substantially radial arms 210, 213, and 215, said spider being intermediately pivoted on a boss of the frame B, as at 211. One leg 210 of said spider-lever is properly formed and normally located in the path of a tappet-cam 212 on shaft 3, to receive at each revolution thereof a rearward movement therefrom, swinging its arm 213, which has a notch 214 in its end, downwardly, and its upwardly-projecting arm 215 swings forward, so that its end may be engaged by the hook 216 of the catch-arm 217, located in the vertical plane of said arm 215 and carried on a horizontal shaft 217^a, which is adapted to rock, and for its support may be extended from the standard A to, through, and beyond the standard

B, and said shaft 217^a also has the radially-extending lever 217^b affixed thereto, which is, however, in a plane coincident with or adjacent to that of the gravity-bar 228, and which gravity-bar as at present arranged is in about the same vertical plane as the arm 172 and the aperture 174 in the bed G, hereinbefore referred to. The forwardly-extending arm 213 is also provided with an upwardly-extending stud 218.

The lever 189 has a rearwardly-extending arm carrying in an offset plane a pivoted dog 220, having a spring 219 applied between it and said arm 189 for maintaining said dog normally depressed, said dog being provided with a stop-lug 222 for limiting its downward swing.

225 represents a horizontally-disposed thrust-rod operated from a cam 221 on shaft 2 in one direction and under the recoil of a spring in the other across the line of said dog 220 when in its depressed position.

Under the usual running of the machine, and envelope-blanks being regularly fed to the bed G at each reciprocating of the parts, the shifter is swung through a quarter of a circle, the pin 202 of its dog 199 being carried into the notch 214 of the spider-arm 213, and then said pin by the movement of said spider is quickly carried downwardly, and the dog is moved with it into and then out of the notch 192 in the crank-shaft disk. The spider-lever is permitted to be moved by its spring to carry the dog out of the said notch by the disengagement of its arm 215 with the catch-hook 216, the same being accomplished by the dropping of the gravity-bar, when the snail-cam under its rotation permits the arm to suddenly swing inward, its arm 236 swinging downward out of support for the gravity-bar, and no effect is had by the shifter to move the crank-shaft disk and crank-shaft. By the non-presence, however, of an envelope-blank on the bed G the shaft 170 is not rocked and at the time the gravity-bar would otherwise be permitted to drop by the operation of the lever O and snail-cam mechanism it (the gravity-bar) is prevented from so dropping, being caught or held by the hooked arm 232, and after the dog has been carried down into the notch of the crank-shaft disk it is not lifted out thereof by the arm 213, for the same is engaged by the catch 216 and not permitted to make the return-swing with its spring, and the dog 199 is not upwardly moved out of the notch 192, and then on the rearward movement of the thrust-rod 225 it abuts by its nose against the pivoted dog 220, forcing the arm 189 rearwardly, so that its lower end passes out of engagement with the nose 188 of the crank-shaft disk, freeing the same for rotation when, on the doubling up of the toggle *v*, carrying the shifter-arm 196 downward and forward, the shifter-disk is partially rotated therewith, and the center line of the cranked portions of the shaft is carried downwardly, so that the distance be-

tween the fulcrum-point *h* of said toggle and the face of the platen is increased, and whereby, on the upward projection of the printing-bed thereby it will be carried only to within a short distance of the plane of printing. A rib 240 of quadrant form is cast on or secured to the frame B, as indicated in dotted lines in Fig. 2 and in plan, Fig. 3, said rib serving to maintain the dog 199 through its pin 202 from any endwise movement on the shifter-arm 196 in its traverse, so that when the dog is raised out of the notch 192 in the regular and proper running of the machine the pin will be made to traverse on the upper side of the rib; but when the dog is not lifted out of the notch, owing to the failure of the gravity-bar to drop, the pin will traverse on the under side of said rib and will continue so to do for as many times as the machine reciprocates and the gravity-bar is held from dropping; and of course under such a disposition of the parts the crank-shaft will be partially rotated at each reciprocation of the machine to afford the lowered fulcrum from which the printing-bed toggle mechanism is operated.

By the automatic controlling of the printing-bed—plainly when no blank is on the bed G—the face of the platen will not be covered with ink from the type on the printing-bed; and due to the effect on the fulcrum-forming cranks *h* of the shaft L for the pivotal support of the toggle-members, as described, under a proper timing and duration of the movements of said crank-shaft L, occasioned by the operation of the mechanism intervening between said shaft L and the pivotally-mounted feeler-arm 172 on the occasion of the non-presence of a blank on the gumming-bed, the said fulcrum-cranks *h* may be caused to remain in the lower plane, not only at the time the toggle-members are being straightened out to project the type-bed upwardly, but also during such a part of the period covering one complete operation of all the parts of the machine, that at the time the toggles are doubled up and the type-bed drawn down the face of the type will lie below the plane of movement of the inking-rollers, which are arranged to be moved over the face of the type, as usual in printing-machines, and thereby, through said mechanism described, the non-presence of a blank on the blank-supporting bed insures the non-inking of the type. Were it not for this result, which is incidental on the operation of the mechanism for controlling the non-impacting of the type against the platen on the absence of a blank from the supporting appliance therefor, the type-face might be so covered and coated by many superposed layers of ink (as would occur if a blank failed to be carried to the place for being printed during a number of rotations of the driving-shafts) that at the next time the type-bed was moved upwardly against the platen to imprint upon the interposed blank, then prop-

erly in place, such blank and several successive blanks would receive such an excessive inked impression as would render them not only in themselves valueless, but also capable of rendering other blanks with which they might be brought into contact also valueless.

What I claim as my invention is—

1. In a printing-machine, in combination, a blank-supporting bed provided with an aperture 174 therein and also an aperture 89, a printing-bed, a shaft L, having an offset or cranked portion *h*, and a cam and toggle actuating devices for operating said bed, one member of said toggle being fulcrumed on said offset portion *h*, substantially as described, a fixed abutment 187 on the machine-frame, and a disk 185, fixed on said shaft, provided with the abutment-nose 186 and notch 192, the shifter N, provided with a sliding dog 199, having a lateral extension 202, and means for imparting a rocking movement to said shifter, the intermediately-pivoted spider-lever *w*, comprising an arm 210, an arm 213, having a notch 214 and an arm 215, a cam 212 for swinging the arms of said spider-lever, a pivoted spring-catch 217 to engage said arm 215, a vertically-guided gravity-bar provided at its upper end with a hook and having a pin 230, and means, substantially as described, for engaging, supporting, and automatically raising said gravity-bar and then suddenly withdrawing from such engagement, and the rock-shaft 170, provided with the arm 172, having a downward extension in the plane of the said aperture 174, and also provided with a hooked arm 232, combined and operating substantially as and for the purpose described.

2. In a printing-machine, in combination, a blank-supporting bed provided with an aperture 174 therein and also an aperture 89, a printing-bed, a shaft L, having an offset or cranked portion *h*, and a cam and toggle actuating devices for operating said bed, one member of said toggle being fulcrumed on said offset portion *h*, substantially as described, a fixed abutment 187 on the machine-frame, and a disk 185, fixed on said shaft, provided with the abutment-nose 186, a locking-nose

188, and notch 192, the shifter N, provided with a sliding dog 199, having a lateral extension 202, and means for imparting a rocking movement to said shifter, the intermediately-pivoted spider-lever *w*, comprising an arm 210, an arm 213, having a notch 214, and an abutment stud 218, and an arm 215, a cam 212 for swinging the arms of said spider-lever, a pivoted spring-catch 217, engaging said arm 215, a spring-sustained pivoted locking-lever 189, engaging said nose 188, having a spring-sustained pivoted dog 220 thereon, and the reciprocating rod 225 and cam 221 therefor, a vertically-guided gravity-bar provided at its upper end with a hook, and having a pin 230, and means, substantially as described, for engaging, supporting, and automatically raising said gravity-bar and then suddenly withdrawing from such engagement, and the rock-shaft 170, provided with the arm 172, having a downward extension in the plane of the said aperture 174, and also provided with a hooked arm 232, combined and operating substantially as and for the purpose described.

3. The combination, with a platen and a blank-supporting bed adapted to have a reciprocatory motion, substantially as described, and provided with an opening therein through which to print, and having an aperture 174 therein, and a pivotally-mounted arm adapted to have a swinging movement in the plane of said aperture, of a printing-bed suitably guided to project its type through the opening in said bed, a toggle device by its one member mounted on a cranked shaft and engaging said printing-bed, a means, substantially as described, for operating said toggle device, and a mechanism interposed between said pivotally-mounted arm and said cranked shaft controlled by the presence and non-presence of a blank on said blank-supporting bed, whereby in the latter event said crank-shaft will be partially turned, substantially as and for the purposes described.

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