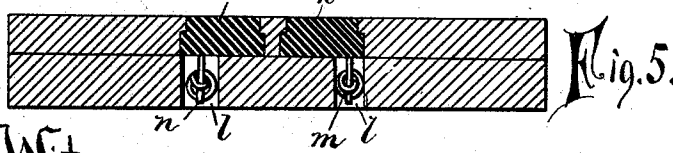
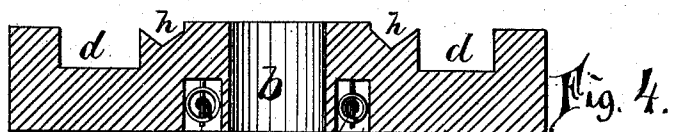
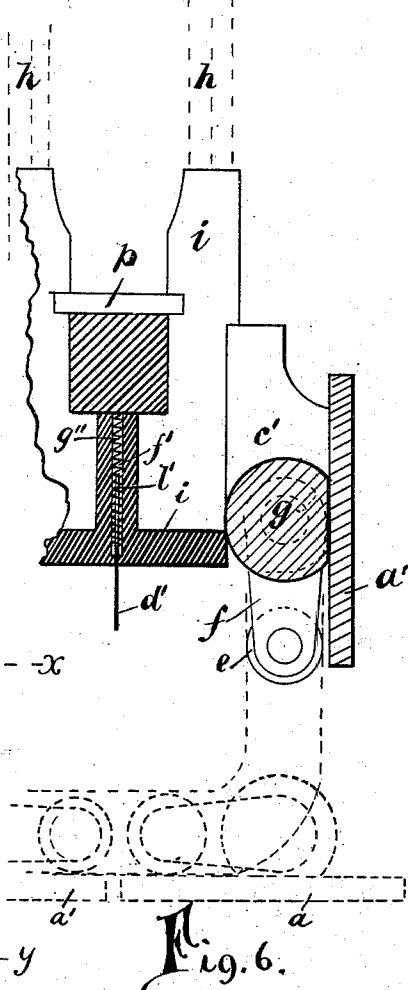
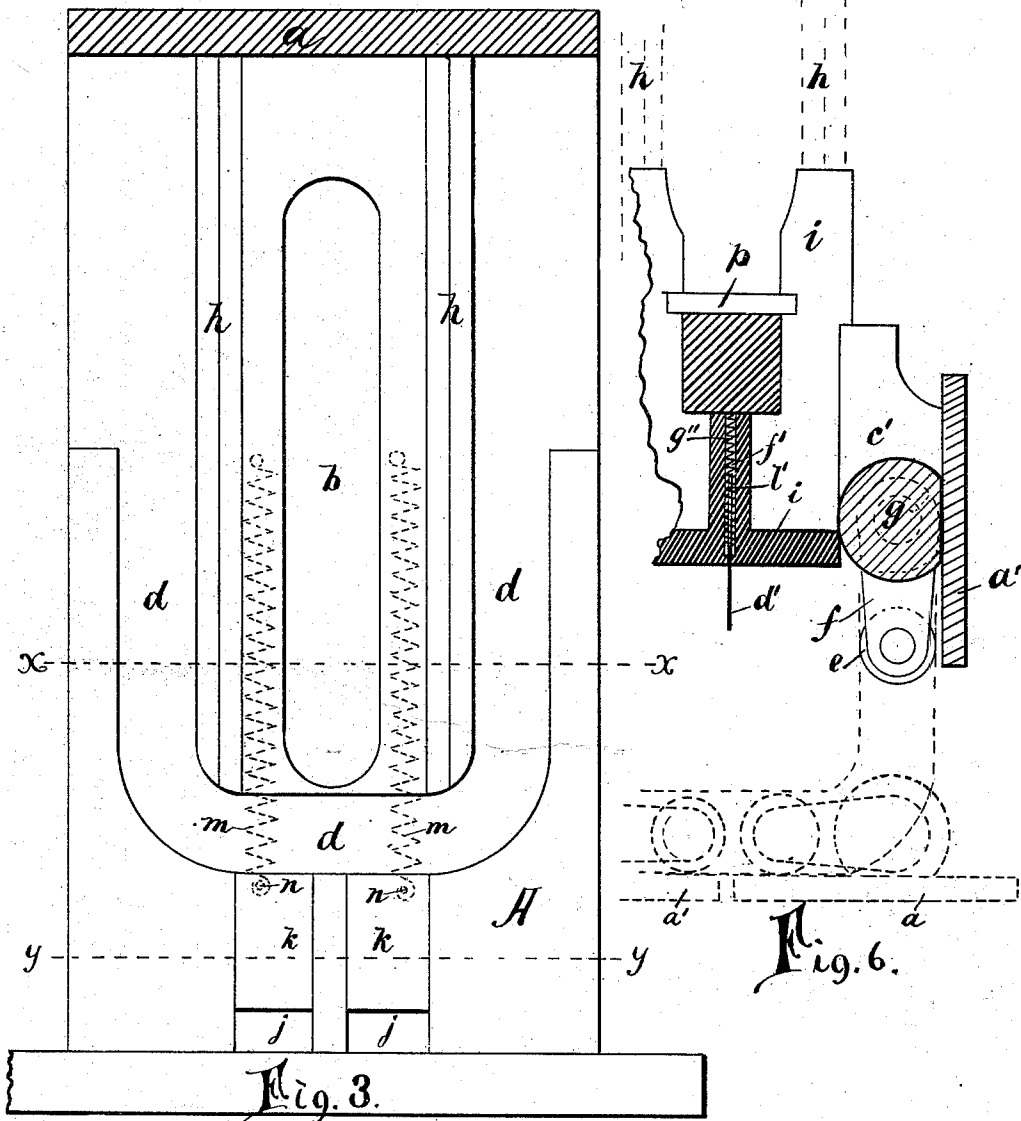


C. W. DICKINSON & G. ROWDEN.

CHROMATIC PRINTING PRESS.

No. 252,000.

Patented Jan. 3, 1882.



Witnesses:
 Charles H. Hill
 Chas. Her.

Inventors:
 Chas. W. Dickinson.
 George Rowden.
 by Oliver Drake, Atty

(No Model.)

5 Sheets—Sheet 3.

C. W. DICKINSON & G. ROWDEN.
CHROMATIC PRINTING PRESS.

No. 252,000.

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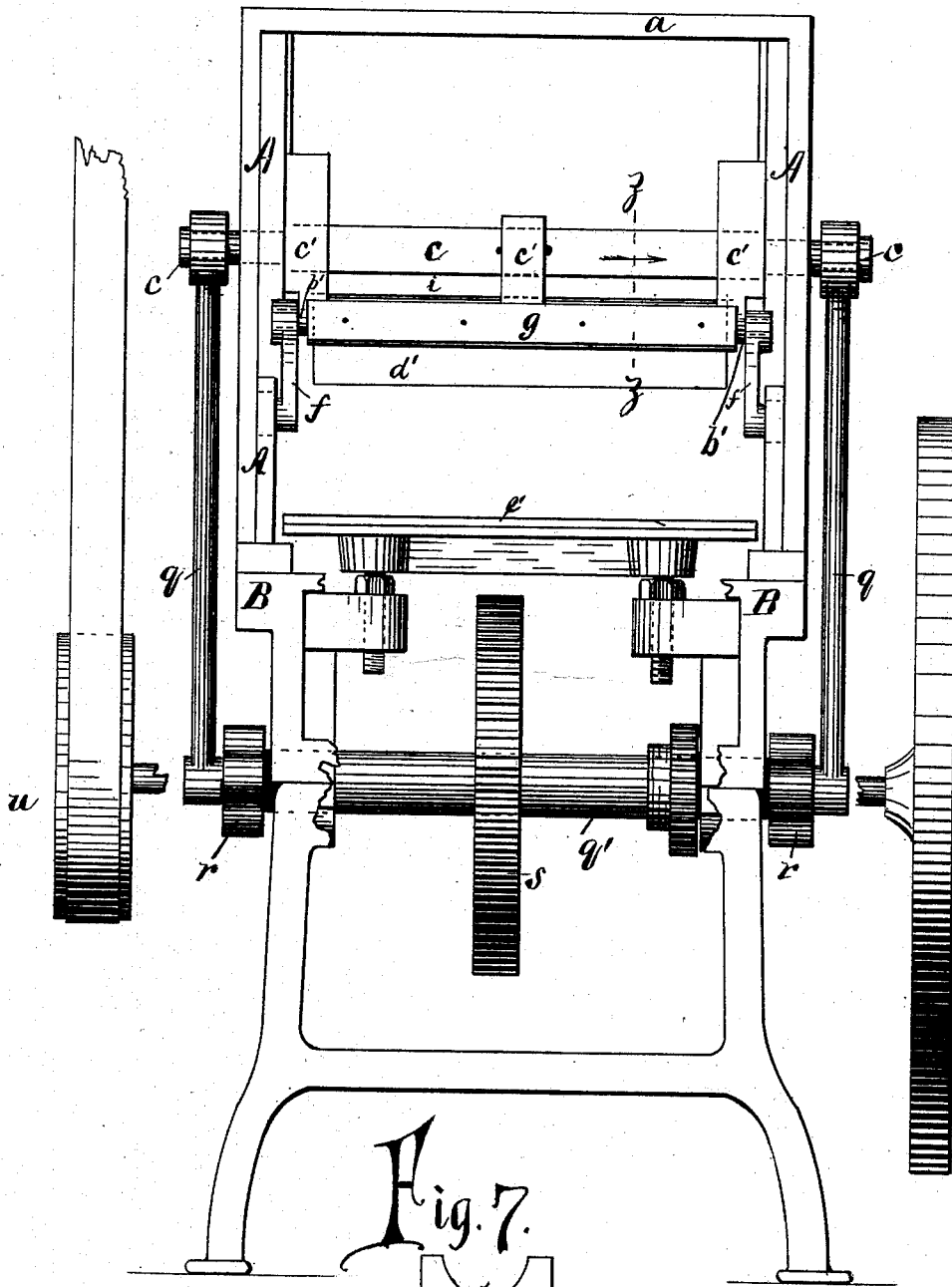


Fig. 7.

Witnesses:
Charles H. Bell
Chas. Kerr.

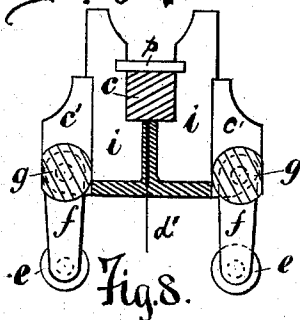


Fig. 8.

Inventors:
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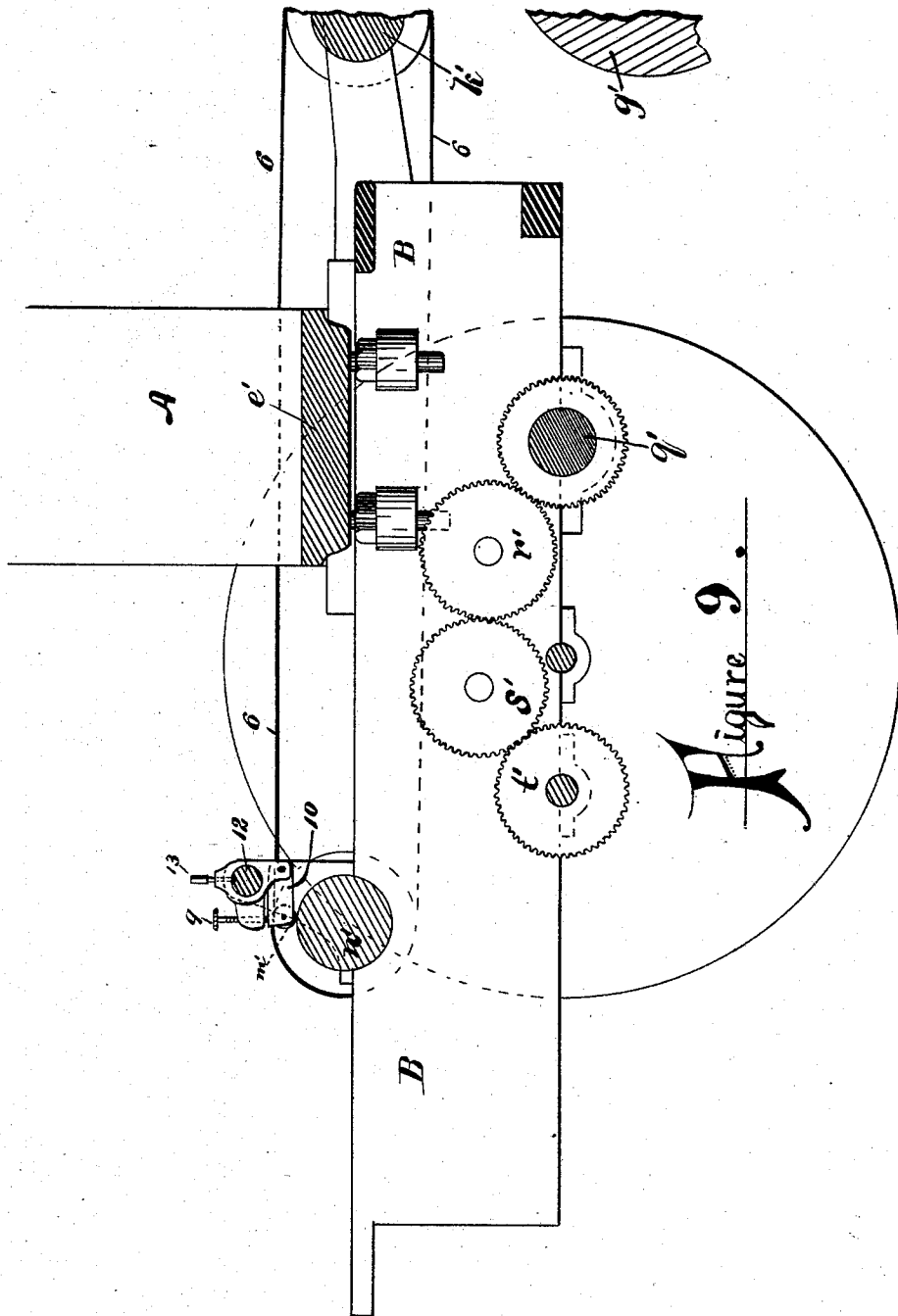
(No Model.)

5 Sheets—Sheet 4.

C. W. DICKINSON & G. ROWDEN.
CHROMATIC PRINTING PRESS.

No. 252,000.

Patented Jan. 3, 1882.



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Char. Herr.

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(No Model.)

5 Sheets—Sheet 5.

C. W. DICKINSON & G. ROWDEN.

CHROMATIC PRINTING PRESS.

No. 252,000.

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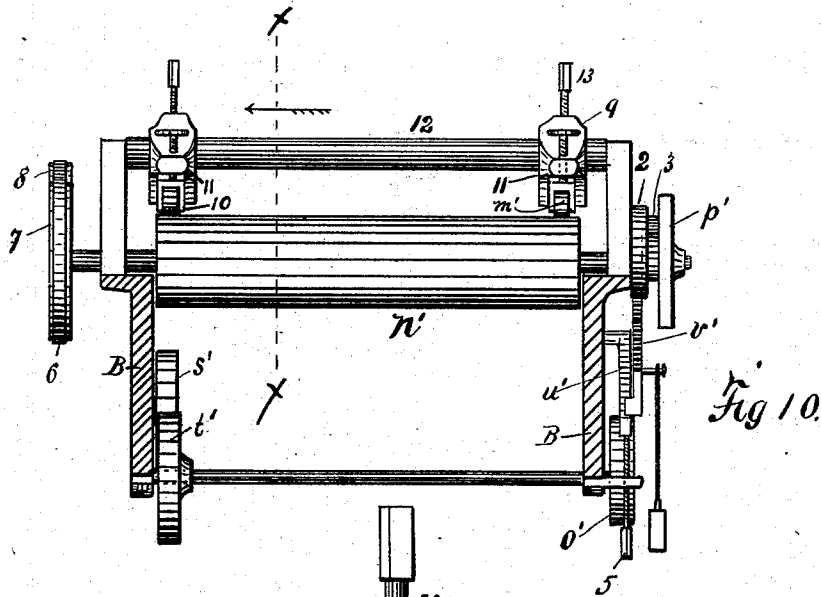
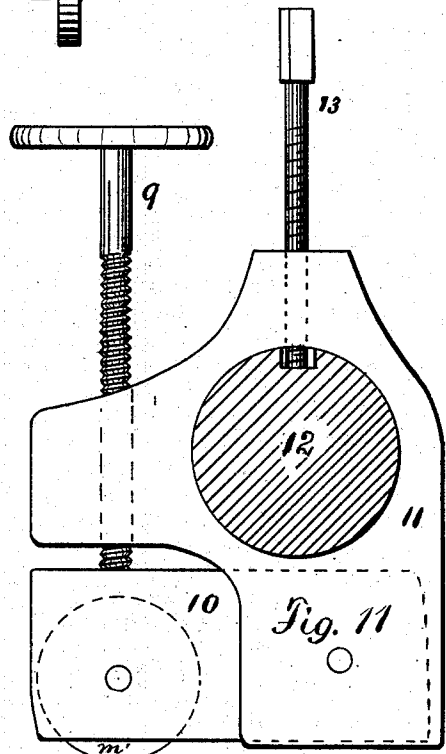
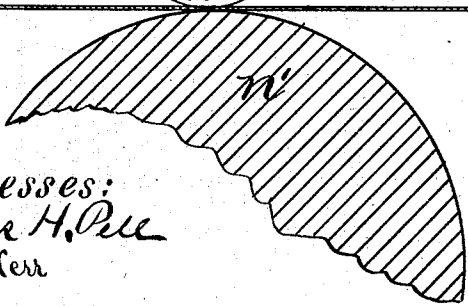


Fig. 10.



ENLARGED SECTION OF ABOVE FIGURE TAKEN THROUGH LINE X.

Fig. 11



Witnesses:
 Charles H. Pyle
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Inventors:
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UNITED STATES PATENT OFFICE.

CHARLES W. DICKINSON, OF BELLEVILLE, AND GEORGE ROWDEN, OF SOUTH ORANGE, NEW JERSEY.

CHROMATIC-PRINTING PRESS.

SPECIFICATION forming part of Letters Patent No. 252,000, dated January 3, 1882.

Application filed February 8, 1881. (No model.)

To all whom it may concern:

Be it known that we, CHARLES W. DICKINSON, of Belleville, and GEORGE ROWDEN, of South Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Printing-Presses; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of this invention is to print in colors in one continuous process with greater facility and neatness than has yet been done. It is adapted more particularly to work upon a class of matter such as illuminated labels, cards, wrappers, and the like, on any grade of paper from a thin and cheap variety to a heavy card-board.

The invention consists in the combinations and arrangements of parts herein described, all of which will be fully illustrated and finally claimed.

Referring to the accompanying drawings, included in five sheets, in which the several letters and figures of reference indicate like parts in each of the figures, Figure 1 is a plan, and Fig. 2 a side elevation, of the machine as a whole, in which said figures the relative positions of the parts are indicated. Fig. 3, Sheet 2, is an interior side view of a cheek-piece; and Figs. 4 and 5 are sections of the same, taken through lines *x* and *y*. Fig. 7, Sheet 3, is an end view of the machine, showing the plunger working in said cheek-pieces; and Figs. 6 and 8 are sectional views of the plunger, taken through line *z* of Fig. 7, looking in the direction indicated by the arrow. Said Fig. 6 more particularly indicates the peculiar action of the parts carrying the chase, by which action the printing is accomplished. Figs. 9, 10, and 11 are views illustrating the parts which operate to carry the paper through the press, Fig. 9 being a sectional view through line *w*, Fig. 1, and Fig. 11 an enlarged sectional view through *x*, Fig. 10.

In carrying out our invention we construct upon the bed-plate B of the machine the cheek-pieces A, which may be united at their tops by a plate, *a*, or other connective. Said cheek-pieces are peculiarly formed to carry and guide the plunger by being perforated by the slot *b*, (Sheet 2, Figs. 3, 4, 5,) in which the plunger-carrying beam *c* works, in a manner more fully described hereinafter, and by having the interior faces thereof each correspondingly traversed by the peculiarly-curved groove *d*, adapted to receive the chase-plate guide *e*, which in the case shown is a wheel working upon an arm, *f*, rigidly secured to the chase-plate shaft *g*. The said interior surfaces of the cheek-pieces are further grooved by the vertical tracks *h*, with which the plunger bed-plate *i* engages. Grooves or sockets *j* are also formed, as shown in said Fig. 3, for the reception of the sliding plates *k*, the object of which will hereinafter be explained. These last said grooves or sockets have communication with grooves *l*, Figs. 2, 4, 5, formed within the exterior surfaces of the cheeks, in which are placed springs *m*, having their upper extremities secured in the upper portion of said groove *l* to the cheek-pieces A, and the lower ends fastened to pintles *n* upon the said plates *k*, which pintles *n* project outward into the said exterior grooves, *l*. The cheek-pieces may be formed of one solid plate having the several grooves above mentioned therein, or they may, for reasons of convenience while in course of construction, be formed of separate plates, as in Fig. 5, the same being joined together by bolts or otherwise. The cheek-pieces may be secured to the bed-plates by having flanges *o* formed thereon adapted to receive bolts, and by that means secured to the bed-plate, as shown; or any other usual method may be employed for accomplishing the same result.

Between the cheek-pieces, upon the tracks *h* therein, works the plunger bed-plate *i*, having the vertical motion necessitated by said tracks. Said plunger-plate *i* is secured to the carrying-beam *c* by the tie-plate *p*, the ends of which are embedded in side portions of the plunger-plate, as shown. The beam *c* receives its motion from the connecting-rod *q*, which receives it

through the crank *r*, cog *s*, pinion *t*, and driving-pulley *u*, each successively from the main pulley and shafting *v*.

Chase-plate shafts *g* are secured upon the plunger-plate *i* in such a manner as to allow the same to revolve or rock therein, the said plunger-plate being constructed so as to form bearings *b'* or boxes for the pivotal ends of said shafts *g*. These said bearings may be either constructed homogeneously with the plunger-plate *i* or may be attached thereto by any of the well-known means. The plunger bed-plate *i* may also have secured thereon or integrally formed therewith bearings *c'* for the chase-plate shaft *g*, so arranged as to resist the pressure of the chase upon the platen *e'*.

The action of the parts described is substantially as follows: The power is transmitted from the main shafting *v*, Figs. 1, 2, and 7, through the driving-pulley *u*, pinion *t*, cog *s*, to the crank *r*, by which and the connecting-rod *q* simple rotary motion is changed to vertical motion, as will be readily understood by reference to said figures. The plunger-carrying beam *c*, actuated by the connecting-rod *q*, brings the attachments connected therewith into regularly-repeated contact with the platen, as follows, reference being had more especially to Sheet 2, Figs. 3 and 6. The downward stroke of the beam *c* causes the chase-plate guide *e*, operating in the curved groove *d*, to change the direction of its passage, as will be clearly understood, and by that means to rotate the said chase-plate shaft *g*, turning the chase-plate *a'* from its former vertical position to a horizontal. In this action the arms *f*, which are rigidly secured to the shaft *g*, act as levers, the guides *e* acting as the powers which swing the chase-plate shaft as desired. When the chase-plate *a'* is thus in its horizontal position the back of said plate will bear against the bottom surface of the plunger bed-plate *i*, by which means a solid resistant surface will be brought to bear against the paper upon the platen to produce a perfect imprint.

For reasons which will be apparent it is necessary to have the chase in its horizontal position at a point considerably above the platen. We have therefore so arranged and constructed the machine as that the chase and type therein contained, after reaching the before-mentioned horizontal position, will be brought down squarely upon the paper, as follows: After turning the angle the guides *e* strike the sliding plates *k*. The upward tension of the springs *m* upon said plates keeps the chase-plate hard against the bottom surface of the plunger bed-plate, as in the manner before stated; but the continued downward action of the beam *c* forces the sliding plates downward until the type come into engagement with the paper. At this point the crank passes the center of motion, the beam *c* moves upward, and the above-mentioned operations are reversed and repeated at will.

It will be seen from the drawings that two

chases are intended to be connected with each plunger-plate, one operating on each side. By this means two colors may be printed upon the paper without removing the type or submitting the paper to a second independent process. The said type, in their upward passage, come into contact with ink-rollers, the ink being supplied in any usual way. This process of inking the type, however, has no connection with my present application. After the first impression by the double plates, mechanism, which will be hereinafter fully explained, is applied to the paper, which causes said paper to travel forward a given distance while the plunger passes upward and returns. Upon the second application of the type to the paper the first plate will give a second color to the second form of printed matter, (first impression,) while the second plate will give a new form, the plunger again rises, the paper passes another given distance, and the process is repeated, the first plate or chase of type giving a second color to the form previously printed by the second plate, this process being successively repeated by a continuous process. The type, being covered with viscous ink, is very apt to draw the paper from the platen on its upward motion, and thereby disarrange the same for a second impression. To obviate this I form a deep slot in and across the bottom of the plunger-plate *i*, parallel with the beam *c*, and into the said slot a steel plate *d'*, is placed. Upon said plate *d'* are secured rods *b'* at convenient and appropriate distances from one another, two or more being preferable to one, although one may accomplish the work. Said rods pass up into holes or recesses *f'*, which are adapted to receive springs *g''*, as shown. Said springs bear against the beam *c*, and are secured to the rod or rods at a point near the plate *d'*. It will thus be apparent that the plate *d'* will have a tendency to project downward from said plunger-plate between the chases when the same are in their horizontal position. When the plunger is in its downward motion the projecting plate *d'* will evidently first strike the paper. Upon the continued downward action of the plunger the said plate *d'* will pass up into the cut until the impression is made. When the plunger and type rise the action of the springs upon the plate still hold the said plate into engagement with the paper, holding said paper firmly upon the platen until the type are entirely clear from the said paper, thus effectually preventing the disarrangement above mentioned.

It is obvious that, should we desire to print in three, four, or more colors, the same may be accomplished by additional mechanisms similar to those described comprising our invention, being built upon the same bed-plate and operating in connection therewith.

In printing by means of our invention it is necessary to draw the paper across the platen by a regular succession of movements and stop-pages, as before intimated, the latter to allow the impressions to be made. This is done as

follows, reference being made particularly to Figs. 1, 2, and 9: The paper is drawn from its original roll g' through and by means of the feed-rolls $h' k'$. It is then drawn over the platen e' by the feed-rolls $m' n'$, the former, m' , being but small friction-wheels adapted to catch the edges of the paper away from the printed portion to obviate smutting the newly-printed matter thereon. It is obvious that the feed-rolls k' and n' should be precisely the same diameter in order to draw the paper uniformly through the machine. The succession of movements of the paper above referred to are produced by the cam o' operating ratchet-wheel p' , connected with the feed-roll n' . Said cam o' receives its rotary motion from the shaft q' , which carries the cog s and crank r through the train of cogs $r s t$. Said cam o' (while the crank r is producing the upward stroke with the rod g and beam c) raises the lever u' . This in turn raises the sliding rack v' . Said sliding rack has teeth formed thereon to engage with the pinion 2, having rigidly secured thereto a pawl-arm, 3, which carries the pawl 4 to engage with teeth on the ratchet-wheel p' .

The last-mentioned parts operate as follows: While the plunger-beam and connecting parts move upward and free the paper from the type the cam o' raises the lever u' and rack v' , turning the pinion 2 and pawl-arm 3, bringing the pawl 4 hard against the teeth on the ratchet-wheel p' , turning the same, and consequently rotating the feed-roll n' , which carries the paper forward. On the return motion of the cam (and while the mechanism connected with the plunger is printing) the lever u' and rack v' fall and the pawl slides over the teeth on the ratchet-wheel preparatory to taking a new hold, the feed-rolls and consequently the paper remaining at rest, as will be clearly understood by reference to Fig. 2. To regulate the distance that it is desired that the paper should travel, we have attached to the bed-plate B, beneath the lever u' , a set-screw, 5, which allows said lever u' to fall but the desired distance, and consequently the cam o' can operate the pawl to but the amount of play remaining.

The feed-rolls n' and k' are connected by belting 6, which runs upon pulleys 7 and 8. Said pulleys have fast connection to said feed-rolls and revolve with them. Therefore when said pulley n' rotates under the influence of the cam o' the said feed-roll k' makes a corresponding motion. Thus the thinnest or lowest grade of paper can be printed upon from off a continuous roll without any danger of tearing—a new and useful feature of improvement never before accomplished, as far as we are aware.

As a substitute for the pulleys 7 8 connected by belting, we can construct a ratchet and pawl corresponding to the one already described upon the feed-roll k' and connect the pawl arm thereof (which would correspond to pawl-arm 3) with the said pawl-arm 3 by a rod. By this device unity of action of the rolls would likewise be produced.

The tension of the side feed-rolls, m' , may be suited to the thickness of the paper by set-screws 9, which bear against the trucks 10 of said feed-rolls, said trucks 10 being pivoted upon the carriages 11, as shown. To suit said rolls m' to any width of paper the said carriages 11, to which the trucks 10 are pivoted and in which the set-screws 9 are held, slide laterally upon the shaft 12, and are secured in the position desired by the set-screws 13.

After the printed paper passes from the feed-rolls $m' n'$ it undergoes the process of being cut into the sizes desired, a portion of the mechanism being shown at J, but which mechanism will form the subject-matter for another subsequent application.

In conclusion, the process which the paper passes through in course of being printed upon by our device is as follows: It passes from the original roll through feed-rolls $h' k'$. The former, h' , may be a wooden roll covered with canton-flannel or other compressible substance, which equalizes the pressure of the paper against the roll h' , which is necessarily hard and unyielding. The paper then passes over the platen, stopping at regular intervals to be impressed by the type held in the chase upon the chase-plate a' . When the impressions are made in the manner hereinbefore explained the plunger and connections rise and the paper is drawn forward by the roll n' , actuated by the ratchet and pawl and connections. The paper receives the first impression of color from the plate nearest the original roll g' , then in due course of operation passes under the second plate, receiving the second color, and so the third and fourth colors, should the machine be so constructed.

I am aware that an intermittently-acting feed-roll has been used in connection with printing-machines, and that it is not new to arrange two sets of feed-rollers with the printing mechanism between them, and therefore I do not claim these features, broadly.

Having thus described our invention, what we claim, and wish to secure by Letters Patent, is—

1. In a printing mechanism having a driving-pulley therewith connected—as, for example, u —the combination, with a plunger and chase-plates, of mechanism substantially such as described, adapted to change said plates from a horizontal to a vertical position, and mechanism substantially such as described, connecting said plunger and said pulley, substantially as and for the purposes set forth and shown.

2. In a printing-machine, the combination, with a plunger connected with driving mechanism, of arms f and guides arranged to rock the chase-plates, and said chase-plates, substantially as and for the purposes set forth and shown.

3. In a printing-machine, the combination, with cheek-pieces and a plunger working therein, of rocking shafts g , arranged upon each

side of said plunger and carrying chase-plates and guides, all arranged and operating substantially as and for the purposes set forth and shown.

5 4. The combination, with cheek-pieces having the curved grooves *d* and grooves or sockets *j* therein, of the plunger and rocking chase-plates, sliding plates *k* and springs connected therewith, the arms *f*, and guides *e*, all arranged
10 and operating substantially as and for the purpose set forth and shown.

15 5. In a printing-machine, cheek-pieces *A*, having therein a curved groove, *d*, adapted to receive guides *e* and to cause the chase-plates to change from a horizontal to a vertical position, tracks or ways *h*, adapted to engage with a vertically-moving plunger, and slots *b*, adapted to receive sliding plates, substantially as and for the purpose set forth and shown.

20 6. The combination, in a printing-press, with the plunger and chase-plates swinging thereon, of a plate lying between said chase-plates and

adapted to strip the paper from the type, substantially as and for the purposes set forth and shown. 25

7. The combination, in a printing-machine, with a plunger carrying swinging chase-plates, of a plate secured between said chase-plates and working in a slot in the plunger, and a spring or springs connected with said plate
30 and operating to hold the same against the paper after the return movement of the chase-plates has commenced, all the parts being arranged and operating substantially as and for the purposes set forth and shown. 35

In testimony that we claim the foregoing we have hereunto set our hands this 24th day of January, 1881.

CHAS. W. DICKINSON.
GEO. ROWDEN.

Witnesses:

STEPHEN M. OSTRANDER,
R. J. PIGOTT.