J. Morse. Sheet 1. 5 Sheets.

Printing Press.

No. 17543. Patented Jun. 9. 1857.

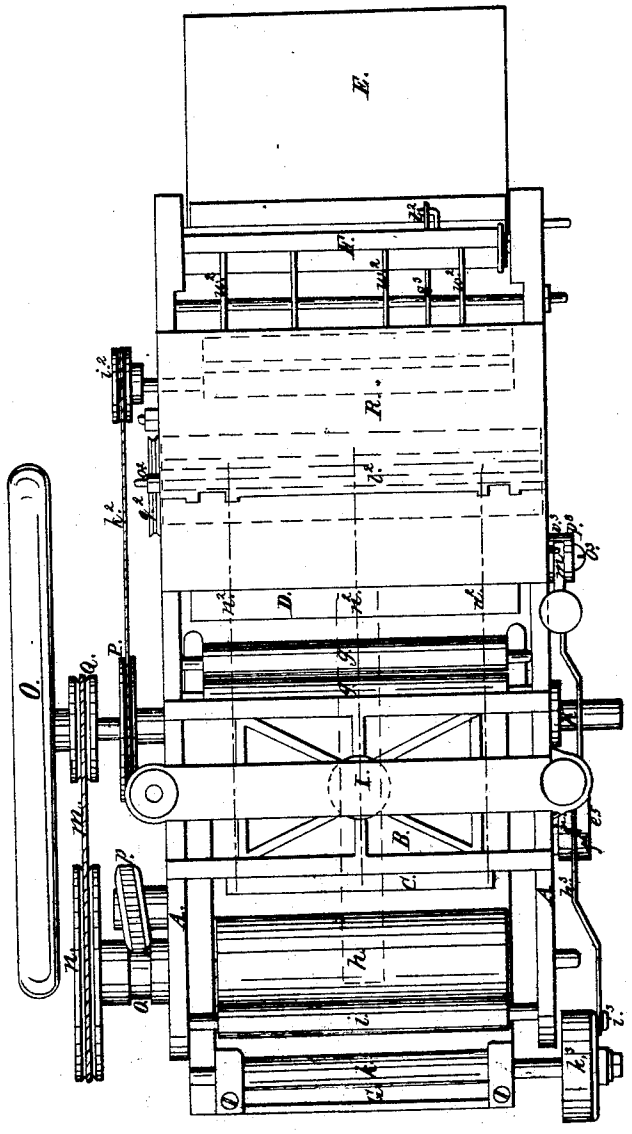


Fig. 1.

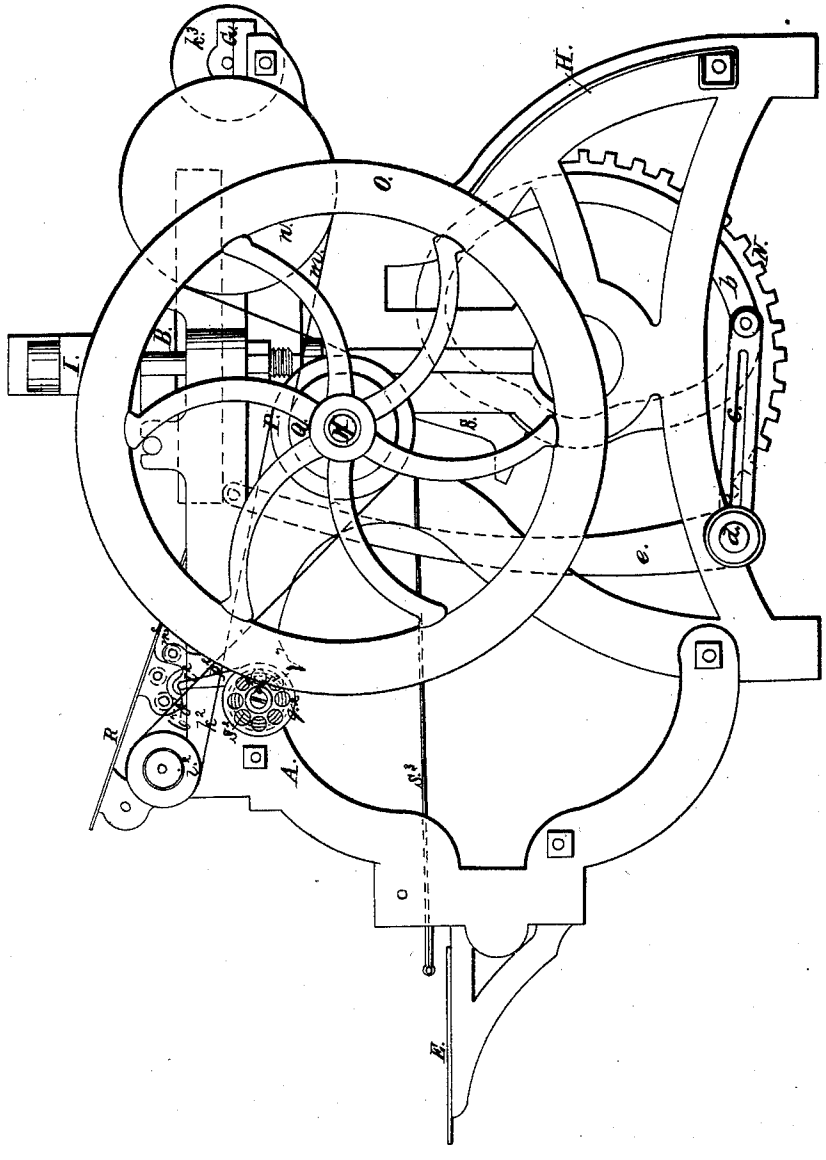
Sheet 2. 5 Sheets.

J. Morse.

Printing Press.

No. 17543. Patented Jun. 9. 1857

Fig. 2.



Sheet 3. 5 Sheets.

J. Morse

Printing Press.

No. 17543. Patented Jun. 9. 1857.

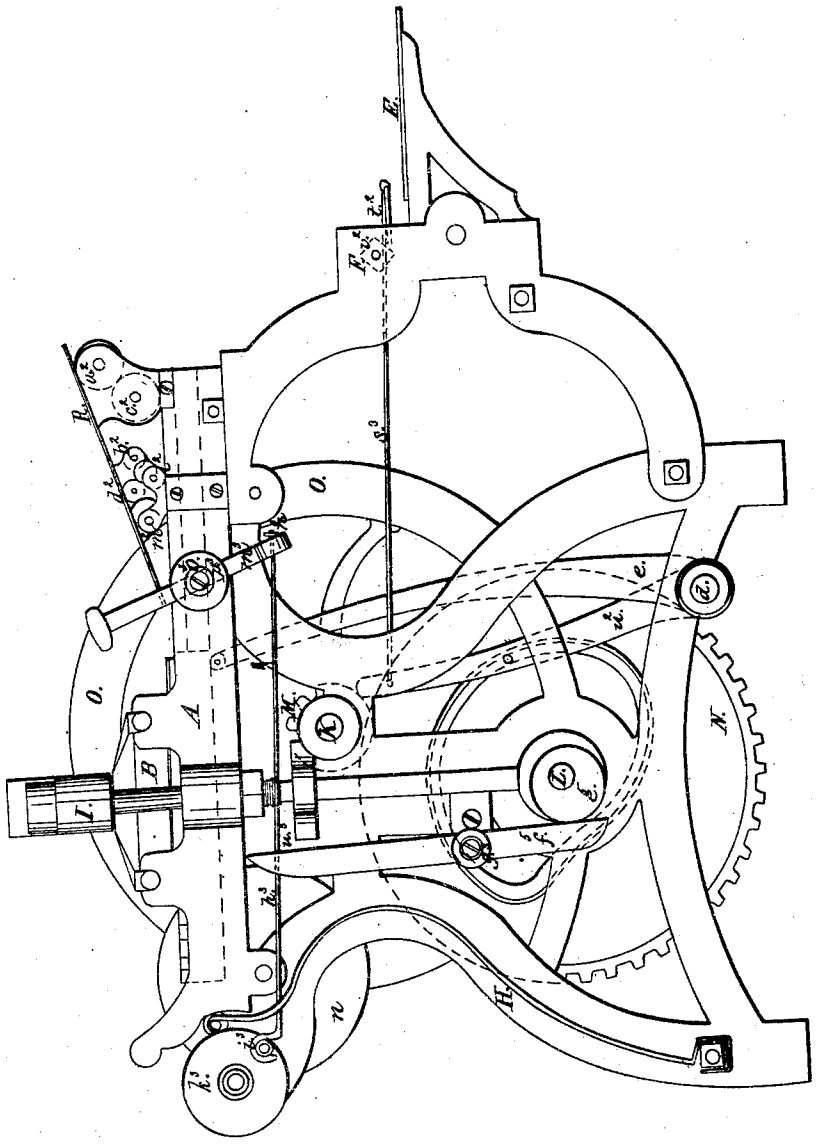


Fig. 3.

Sheet 4. 5 Sheets.

J. Morse.

Printing Press.

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Fig. 10.

Fig. 9.

Fig. 7.

Fig. 8.

Fig. 6.

Fig. 4.

Sheet 5. 5 Sheets.

J. Morse.

Printing Press.

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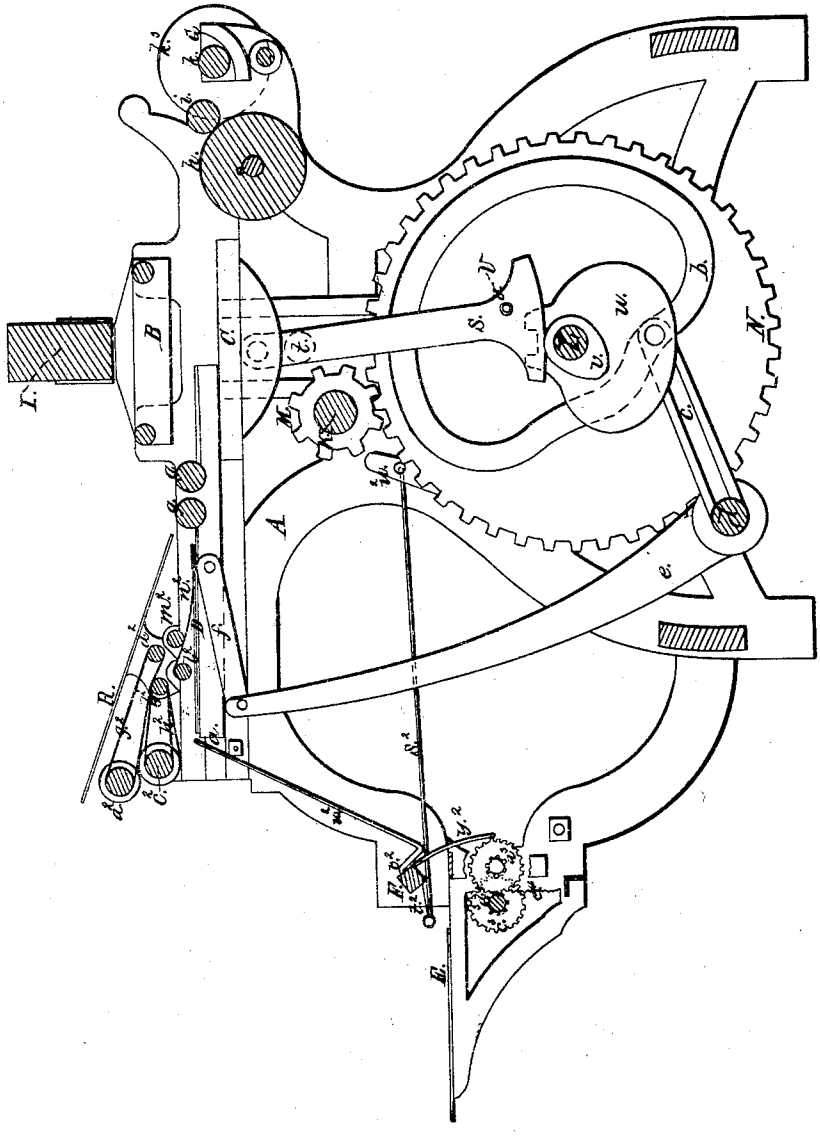
Fig. 5.



UNITED STATES PATENT OFFICE.

JEDEDIAH MORSE, OF CANTON, ASSIGNOR TO THE S. P. RUGGLES POWER PRESS MANUFACTURING COMPANY, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN POWER PRINTING-PRESSES.

Specification forming part of Letters Patent No. **17,543**, dated June 9, 1857.

To all whom it may concern:

Be it known that I, JEDEDIAH MORSE, of Canton, in the county of Norfolk and State of Massachusetts, have invented an Improved Power Printing-Press; and I do hereby declare that the same is fully described and represented in the following specification, and the accompanying drawings, of which—

Figure 1 is a top view of the same; Fig. 2, a front side elevation of it; Fig. 3, a rear side elevation of it; Fig. 4, a vertical and transverse section of it, such being taken through its front rocker type and so as to show the mechanism in rear of the same. Fig. 5 is a longitudinal and vertical section, it being taken in front or to the right of the main cam-gear and so as to exhibit the mechanism for operating the bed.

Such other figures as may be necessary to a correct delineation of my improvements will be hereinafter referred to and described.

In such drawings, A exhibits the press-frame; B, the platen; C, the movable bed; D, the sheet-carrier or "frisket-carriage," as it is sometimes termed; E, the pile-platform, and F the fly or fly-frame.

G is the ink-fountain, H H the arch-rods, and I the arch-bar, directly under which the platen is arranged.

K is the driving-shaft, and L is the main cam-shaft, the two being geared together by a pinion M and a main cam-gear N, fixed to them, respectively. The driving-shaft carries a fly-wheel *o* and two grooved pulleys P Q, which are arranged on it, as shown in Figs. 1, 2, and 4, such driving-shaft, when the machine is in operation, being rotated by power applied to it in any proper manner.

The sheet-carrier D is a rectangular frame, which slides horizontally on ways *a a* and has an intermittent, reciprocating, and rectilinear motion imparted to it by means of a cam-groove *b*, which is made in the side of the gear N and operates an arm *c*, extended from a horizontal shaft *d*. From the said shaft two arms *e e* rise upward, each being jointed to the carrier by means of a pitman *f*, arranged as shown in Figs. 4 and 5.

Inking-rollers *g g* are carried by the carrier D, so as to ink the form of type and receive their ink from a drum or cylinder *h*, which obtains its ink from a vibrating roller or carrier *i*, playing between it and the ink-roller *k* of the ink-fountain. Machinery is applied to the cylinder or drum *h* in order to impart to it rotary and endwise movements. For rotating it an endless band *m* passes around the pulley Q and another pulley *n*, the latter being fixed on the shaft of the cylinder.

For imparting an endwise reciprocating movement of the cylinder, in order that the ink may be laid evenly on the inking-rollers, there is placed on the shaft of said cylinder a lantern-grooved gear or pinion *o*, formed with a groove around its periphery and with its cogs or teeth at the bottom of said groove. Into this lantern-gear a gear *p*, rotating on a stationary pin or stud, works. This gear *p* has its plane inclined with respect to that of the lantern-gear, and so that when both are in rotation the gear *p* will act as a cam on the gear *o* and move it and its shaft laterally.

The cam-shaft L carries two cams *r r*, which respectively operate against pendulous rocker-toggles *s s*, hinged to the bed C. Figs. 6 and 7 are inner side views of these rocker-toggles and the mechanism immediately adjacent to and operating with them, they being jointed together by a bar *t*, extended from one to the other, and so fixed to them as to cause one of the toggles to be moved by and with the other. Besides the cams *r r* the shaft L is furnished with another cam *u*, which is arranged close to one of the toggle-cams *r r* and so as to operate against a pin *v*, extending from the inner side of the adjacent pendulous toggle. During the rotation of the shaft L the cams *r r* act against the rocker-toggles and force them upward, so as to elevate the bed toward the platen, the cams and toggles by their conjoint action serving to produce the required pressure for printing a sheet of paper. The object of the additional cam *u* and the stud *v* is to so control the movements of the toggles toward the cams which may be approaching them as to prevent the cams from striking the toggles with a concussion or blow such as would not only operate to the injury of the machine, but be likely to displace the type more or less. Other advantages also result from the above. As soon as the bed drops down to its lowest position the

toggles by their gravitating power swing backward, so as to be in a proper position for the cams to again operate and roll against them.

In order that the toggles, after they may have fallen back, may not vibrate forward out of their proper time, the rearmost toggle is provided with a stud x, which projects from its rear side and operates with a drop-latch y, arranged as shown in Fig. 6. This drop-latch turns on a pin z and rests on a shelf a'. When the toggles fall backward, the stud x will go under and lift and pass by the drop-latch, which immediately after the same has taken place will fall down upon its shelf, and by resting thereon will prevent the toggle from vibrating forward until it is elevated above the drop-latch. This will be effected when the toggles are next forced up by the cams. During the next movement of the toggles, that next adjacent to the drop-latch will pass over and down in front of the latter, so as to be capable of going underneath it, as above described.

The press is provided with an inclined table or plate R, on which the sheets of paper to be printed are to be laid. Underneath the table there are arranged four discharging-rollers a^2 b^2 c^2 d^2. Two of them a^2 and c^2 are geared together, as shown at e^2 and f^2. Fig. 8 is an under side view of the said plate and rollers. The two rollers a^2 b^2, as well as the other two c^2 d^2, are furnished with a series of endless bands g^2 or h^2, arranged as shown in the drawings. A pulley i^2 is fixed on the shaft of the roller c^2 and has an endless band k^2 extending around it and the pulley P, hereinbefore referred to, the same serving to put the discharging rollers and belts in revolution. The whole, or belts and rollers, may be termed the "sheet-discharging apparatus." It operates in connection with two rollers l^2 m^2, arranged as shown in Fig. 5 and by dotted lines in Fig. 1. A set of rods or bands n^2 n^2 n^2 is fastened to the roller l^2 and to the front edge of the sheet-carrieres and pass underneath the roller m^2. A small barrel or drum o^2 is fixed on the shaft of the roller l^2 and has a cord p^2 attached to it and wound around it and fixed to the periphery of a barrel or pulley q^2, which rotates on a pin r^2, and has a coiled spring (represented at s^2 by dotted lines) arranged within and fixed to it and the pin r^2, as the mainspring of a watch is arranged in its barrel and fixed thereto and to its arbor. The object of the spring-pulley and cord is to turn back the roller l^2 and wind the tapes or bands thereon while the carrier is moving backward. During the forward movement of the carrier with a sheet of paper the latter will rest on the bands; but while the carrier is being retracted the bands cause the sheet of paper to pass between the rollers l^2 m^2 and so as to be delivered or properly presented to the discharging apparatus, which, seizing the sheet, moves it back and down upon the fly, by which it is turned over upon the pack on the table or platform E. This fly is put in motion by a pitman s^3 and two arms t^2 u^2, arranged as shown in the drawings, the arms projecting, respectively, from the fly and the shaft d. This fly is constructed of a shaft v^2 and a series of arms or fingers w^2 w^2, extended from it, as shown in the drawings. On this fly-shaft is a small eccentric x^2, (see Fig. 9,) which is a section of the eccentric and exhibits on an enlarged scale the mechanism for lowering the pack-platform. This eccentric works in a draw-pawl y^2, which acts against a ratchet a^3, that by means of gears b^3 c^3 gives rotary motion to a shaft d^3. This shaft carries two pinions, which operate, respectively, in vertical racks extending down from the pile-platform, one of the said pinions and its rack being seen at d^4 and e^4 in Fig. 9. The said pile-platform should be so applied to the frame A as to be capable of being moved freely in vertical directions.

From the above it will be seen that during the reciprocating or back and forward movements of the fly the pawl thereof will cause the train of wheels to be put into an intermittent motion, such as will gradually depress the pile-platform. If the machinery be properly proportioned, the said platform may be caused to descend in the proper degree and rate as the pile of paper received on it may increase in thickness.

On the outer end of the main cam-shaft L is a cam e^5, which works against a lever f^5. (See Fig. 3.) This lever turns on a fulcrum g^3, and is bifurcated at its upper end and straddles a rod h^3, which is arranged as shown in said figure, and jointed to the crank-pin i^3 of a rotary plate or wheel k^3, and turns freely on the shaft of the ink-fountain roller. The rod h^3 extends through the lower arm of an adjustable lever m^3 and has a knob or head n^3 fixed on its outer end. This lever turns on a fulcrum-screw o^3 and between two friction-plates p^3 r^3, the latter of them being fixed to the press-frame. By screwing up the fulcrum-screw the lever may have any necessary degree of friction between the plates when it is moved on its fulcrum.

An internal ratchet s^5 is fixed on the shaft of the ink-fountain roller, and in order to operate therewith the disk or plate k^3 carries a spring-pawl l^5, the same being as shown in Fig. 10, which is a section of the ratchet, and exhibits not only its teeth, but the said pawl. A pin u^3 extends through the rod h^3 and near to the lever f^5, as shown in the drawings. Furthermore, a weight v^3 is affixed to the pawl-plate in position, as shown in Fig. 10. The gravitating power of the weight elevates the pawl and turns the ratchet, so as to rotate the friction-roller until the knob n^3 brings up against the lever m^3.

Although the lever f^5 has a positive motion, the rod h^3 may have a variable one, or one which may be varied according to the position of the adjusting-lever m^3, which determines the amount of the fall of the weights and of course the extent of forward movement

of the pawl. From the above it will be seen that the rotary motion of the fountain-roller may be either increased or diminished, as occasion may require, in order to enable it to impart more or less ink to the carrier-roller.

What I claim as of my invention in the above-described press is as follows:

1. The combination and arrangement of mechanism or devices for supporting the sheet of paper over the carrier or frisket-carriage and guiding and presenting it to the discharging apparatus, such devices consisting of the cords n^2 n^2, the rollers l^2 m^2, the drum o^2, cord p^2, and the barrel or pulley q^2, provided with a spring or its equivalent, as described.

2. The combination of the cam u and stud v with the rocker-toggle and its operating-cam, the same being for the purpose as specified.

3. The combination for regulating the rotary motion of the ink-fountain rollers, the same consisting of the adjustable stop-lever m^3, the connecting-rod h^3, the cam e^5, the lever f^5, the weighted plate k^3, and the pawl l^5, and the internal ratchet s^5, constructed and applied together substantially as specified.

4. Combining with the pile-platform and the fly a mechanism, substantially as described, which by the reciprocating movements of the fly shall lower the platform in correspondence with the increase of thickness of the pile, such mechanism being the cam on the fly-shaft, the pawl thereof, and the train of gears and racks, applied and operating as specified.

5. The mechanism or combination for imparting to the ink-cylinder h endwise motions, as described, the same consisting of the grooved pinion or gear o, and the inclined gear p, constructed, arranged, and applied together and so as to operate substantially as specified.

In testimony whereof I have hereunto set my signature.

JEDEDIAH MORSE.

Witnesses:

R. H. EDDY,

F. P. HALE, Jr.