W. A. HARP.

PRINTING-PRESS.

No. 192,256. Patented June 19, 1877

Fig. 1.

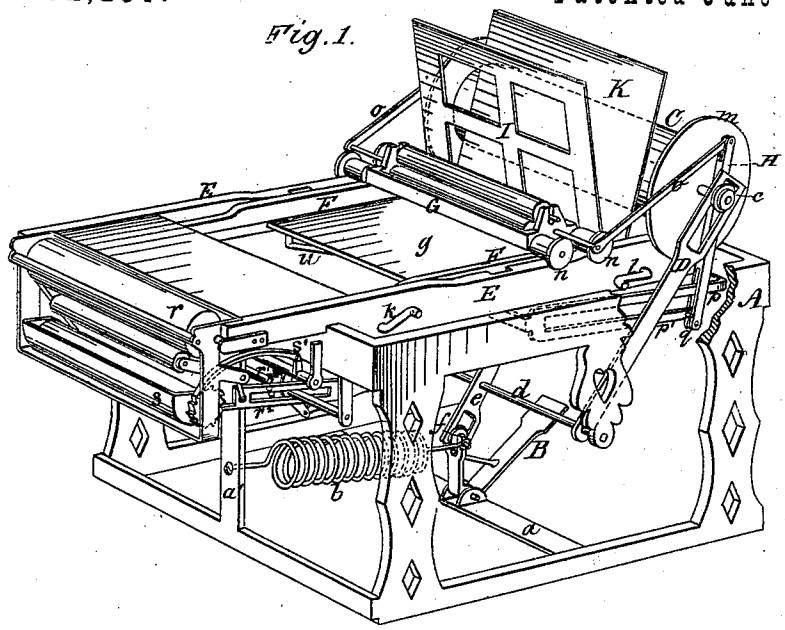
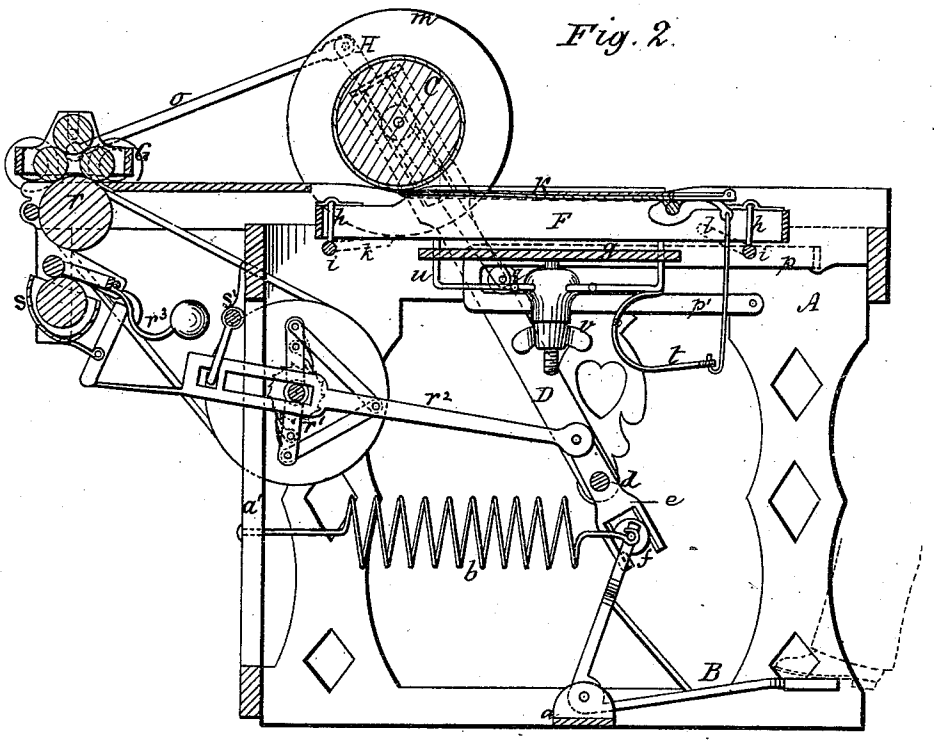


Fig. 2.



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UNITED STATES PATENT OFFICE.

WILLIAM A. HARP, OF COVINGTON, GEORGIA, ASSIGNOR OF ONE-HALF OF HIS RIGHT TO ENOCH STEADMAN, OF SAME PLACE.

IMPROVEMENT IN PRINTING-PRESSES.

Specification forming part of Letters Patent No. **192,256**, dated June 19, 1877; application filed November 2, 1876.

To all whom it may concern:

Be it known that I, WILLIAM A. HARP, of Covington, in the county of Newton and State of Georgia, have invented certain new and useful Improvements in Printing-Presses; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and complete description thereof.

My said improvements are described as if embodied in a roller-press operated by foot-power; but some of them are separately applicable to presses of other kinds, whether operated by foot or other motive power.

One feature of my invention consists in the combination, with a flanged impression-roller, of a roller-track mounted on levers connected with rock-shafts, which are also provided with end levers, which lie in the path of the flange of the roller, whereby the roller in its forward movement bears sufficiently upon the form to secure a good impression, and on striking the end levers of one of the rock-shafts causes it to lift the track, so that the roller, during its return movement, is raised from the form, for preventing a double impression, and also whereby the roller, when completing its return movement, will strike the end levers of the other rock-shaft, thereby lowering the track, so that the roller may again move forward with pressure upon the form.

Another feature of my invention consists in the combination, with the flanged roller, the track, the rock-shafts, and the levers, of adjustable stops or studs beneath the track, whereby said track may be limited in its downward movement, and secure proper relations between the roller and the type-surface of the form, for attaining a light or a heavy impression.

Another feature of my invention consists in the combination, with a weighted treadle, of a rock-shaft, slotted levers, and the impression-roller, the shaft or axis of which at each end occupies a slot in one of the levers, whereby the downward movement of the treadle induces a complete forward movement of the roller, and a spring or weight induces its complete return movement in an easy, rapid, and effective manner.

Another feature of my invention consists in the combination, with the impression-roller and the ink-roller carriage, of levers pivoted on the shaft of the roller, connected by links to the ink-roller carriage, and provided with parallel guiding-bars, whereby the inking-carriage is moved coincidently with the impression-roller, but at an increased rate of speed in both directions.

To more particularly describe my invention, I will refer to the accompanying drawings, in which—

Figure 1 represents, in perspective, a printing-press embodying my improvements, with a portion of the frame broken away to exhibit portions of the working mechanism. Fig. 2 represents the same in longitudinal central section.

A denotes the frame of the machine. The lateral brace *a* at the bottom serves as a base for the treadle B, and the vertical brace *a'* supports one end of the retractile spiral spring *b*, which is connected with the treadle.

C denotes the impression-roller. At each end its axle is provided with a grooved friction-pulley, *c*, which occupy the slots of levers D. These slotted levers are rigidly secured to the lateral rock-shaft *d*, which is journaled in hangers at each side of the frame. The rock-shaft is provided centrally with a pendent slotted arm or lever, *e*. The treadle-lever B is provided with a friction-pulley, *f*, which occupies the slot of the pendent arm or lever *e*.

By depressing the treadle the system of levers described imparts motion to the roller, carrying it from the front of the press to its rear, and the return movement thereof is effected by the spiral spring *b* operating in like manner through the rock-shaft and its levers.

E denotes an auxiliary portion of the frame which supports the roller, type-bed *g*, and inking apparatus.

F denotes a movable track for the roller. It is a rectangular frame, with sides parallel with the inner sides of the auxiliary frame E, and it is longer than the type-bed, so that when the roller C moves forward over the form its pressure thereon may be regulated, and also so that as the roller moves back-

ward it may be elevated wholly from contact with the type-surface.

The roller-track is mounted on the levers or arms *h* of the rock-shafts *i*, so that when the rock-shafts are turned in their bearings, which are in the auxiliary frame, the track will be raised or lowered. At the outer ends of the rock-shafts are crank-levers, as at *k* and *l*, the former being on the lifting rock-shaft, and the latter on the lowering shaft. The roller C is provided with flanges *m*. When the roller commences its forward movement the track F occupies its lowest position, which permits the roll to make a proper impression. When the roller has nearly completed its forward stroke, its flanges *m* strike the rock-shaft levers *k*, which raises the track, say about one-quarter of an inch, and the arms of the rock-shaft hold it in that elevated position. The roller then moves backward thereon, wholly free from the type-surface, until its movement is nearly completed, when the flanges strike the levers *l*, which, through their rock-shaft, lowers the track to its normal position. Throughout the length of the type-bed the upper edge of the sides of the frame E are cut away, so that the roller for that distance will travel solely upon the track; but after reaching points adjacent to the ends of the type-bed, the roller rides upward upon the edge of the frame wholly free from contact with the track, so that the latter is readily raised by the force of the blow of the flange upon the levers of the rock-shaft, and afterward firmly set in position by the weight of the roller.

G denotes the ink-roller frame or carriage which traverses the type-surface or form.

The carriage is mounted on four rollers *n*, two at each end, arranged to travel on the track F. Three rollers are shown, two of which move in contact with the type; the third roller rests upon these two and operates as an evener or distributer.

The inking-roller carriage is moved coincidently with the roller, but at a greater rate of speed, by means of the peculiar system of levers. At each end of the roller-shaft or axle is a lever, H, pivoted thereon. The upper ends of these levers are connected to the roller-carriage by the links *o*. The lower portions of the levers H are slotted, and they embrace in each instance a longitudinally-guiding bar or rod, *p*, secured at its rear end to the auxiliary frame E. The lower ends of the levers H are also provided with friction-rollers, as at *q*. Below each guiding-bar *p*, and parallel with it, is a second bar or rod, *p'*, and the space between the two is occupied during a portion of the time by the friction-roller *q*.

When the roller is at the front of the machine, the upper end of lever H is inclined toward the front, which locates the ink-roller frame over the front end of the form. The rollers *q* are both clear from the guiding-rods, and the lever projects below them, as shown in Fig. 1. As the roller is moved forward the levers H are moved forward bodily with it, but they also commence to assume an inclined position with their upper ends toward the rear of the press, because the roller *q* abuts against the front end of the lower guiding-rod *p'*, until the roller has so far advanced that the roller *q* enters the space between the guiding-rods. Therefore, the roller-carriage moves more rapidly forward and backward than the roll, although motion is imparted to the carriage through the axle or shaft of the roll.

When the inking-carriage is at the rear of the press it rests upon the inking-plate, and the surface of its rollers engages with the surface of the distributing roll *r*, which is intermittingly rotated as follows: It is belted to a pulley on a shaft, which carries a ratchet-wheel, r^1, with which two pawls engage, which are mounted on arms actuated by a rod, r^2, connected with the rock-shaft *d* above the treadle, so that every longitudinal movement of rod r^2 in either direction moves the ratchet-wheel one tooth, and through it imparts motion to roll *r*. The rod r^2 at its rear end engages by abutment with a pendent lever, which, by intermittent contact with the weighted lever r^3, causes a roll to vibrate between the roller in the ink-fountain *s* and the lower surface of the upper roll *r* at each stroke of the treadle. The roller in the ink-fountain is revolved intermittingly by a ratchet on its shaft, with which a pawl on lever *s'* engages, when said lever is actuated by the rod r^2, in a manner fully obvious.

The frisket I and tympan K are hinged together at their lower ends at each side, leaving a free open space between them when raised for the downward discharge of the printed sheet. The frisket is pivoted at each side to the auxiliary frame E, and it is also connected at each lower corner to springs, as at *t*, which, when the tympan and frisket are not held down by the roller, cause them to assume a position nearly vertical, as shown in Fig. 1. The frisket and tympan when in this position are separated by springs which are interposed between them.

The type-bed *g* is of course fixed immovably to the frame E. In order to graduate the pressure of the roller upon the form, it is necessary that the roller-track be adjustable with relation to the bed, so that the track shall only be lowered to such extent as will secure the required impression. For limiting the downward movement of the frame, I employ four upright studs, *u*, which occupy four vertical holes in the type-bed, one at each corner thereof, below the track. These studs are mounted upon arms beneath the type-bed, which radiate from a central hub which is occupied by a fixed screw, which projects downward from the lower surface of the type-bed. A thumb-nut, *v*, on this screw, supports the hub, its arms and studs, *u*, so that by raising or lowering the nut the studs are raised or lowered, and set in any desired position for adjusting

the height of the upper surface of the track with relation to the type-surface of the form, and thus securing a light or heavy impression during the forward movement of the roller without affecting the lifting capacity of the rock-shafts for raising the track during the backward movement of the roller.

From the description of the parts thus given, it will be obvious that when the treadle is depressed the roller will move forward on the lowered track, carrying down the tympan and frisket, driving forward the inking-carriage over the form in advance of the downward movement of the tympan, completing the impression and placing the roller-frame upon the inking-plate, and in proper contact with the distributing-roller; also, that when the treadle is allowed to rise, the spring will carry the roller and inking-frame backward on the raised track, allow the frisket and tympan to fly upward and discharge its sheet, and that meantime the ink-feeding rollers will be properly moved in a manner well known.

In operation my press requires but little power, and can be worked at high speed with satisfactory results. It is simple and comparatively inexpensive, and well suited for general service. It will of course be obvious that ordinary motive power can be readily applied to my press by means of a lateral shaft above the treadle, carrying a cam, which, by its pressure on the treadle and its release thereof, would impart the same movements to the treadle as if it were operated by the foot in the usual manner.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with a flanged impression-roller and a type-bed, of a roller-track mounted on levers, connected with rock-shafts which are provided with arms or levers at their ends, lying in the path of the roller flanges, substantially as and for the purposes specified.

2. The combination, with the flanged roller, type-bed, vertically-moving track, its rock-shafts and levers, of vertically-adjustable studs or stops beneath the track, substantially as and for the purposes specified.

3. The combination, with a weighted or spring treadle and an impression-roller, of a rock-shaft and slotted levers, connected with the treadle and roller, substantially as and for the purposes specified.

4. The combination, with an impression-roller which moves over a stationary type-bed, and an inking-roller frame or carriage, of levers pivoted on the axis of the roller, links connecting the upper ends of said levers and the carriage, and parallel guiding-rods which control the lower ends of the levers, substantially as and for the purposes specified.

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