2 Sheets—Sheet 1.

E. DUMMER.

Printing-Presses.

No. 197,021. **Patented Nov. 13, 1877.**

Fig. 1.

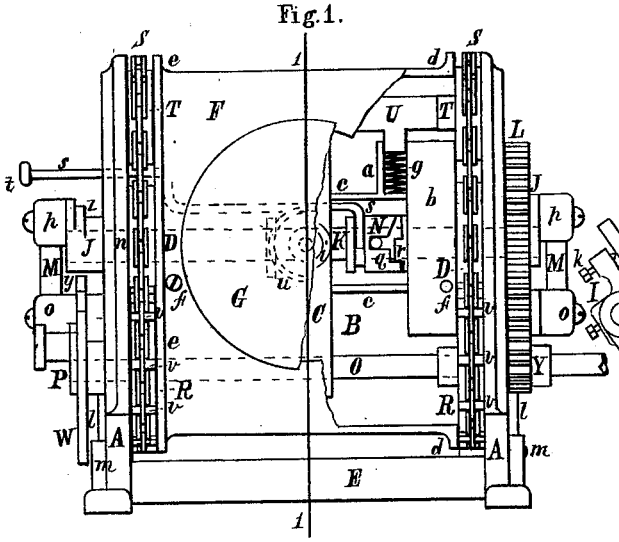


Fig. 2.

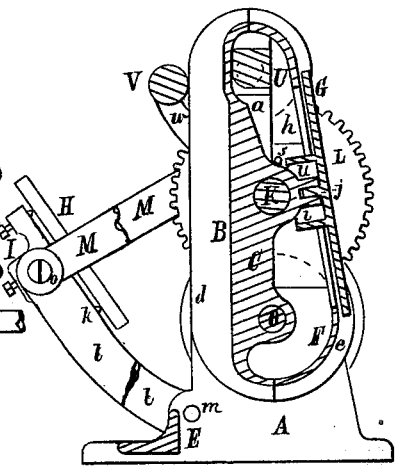


Fig. 3.

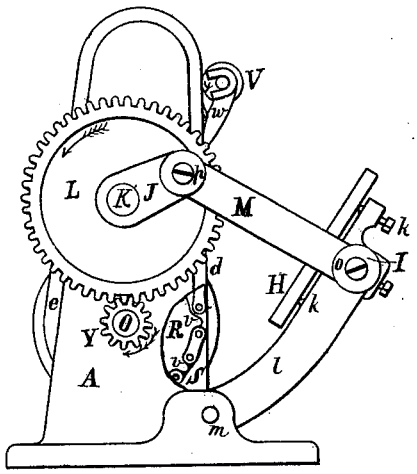
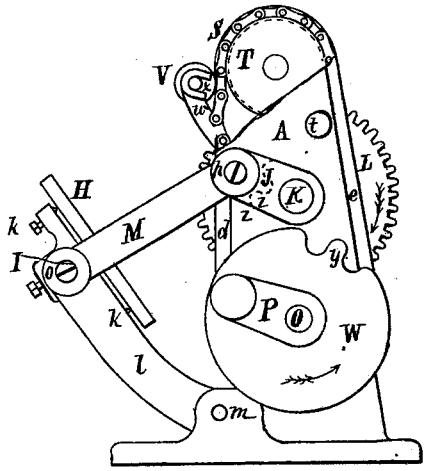


Fig. 4.



Attest:

H. W. Bricher.

F. F. Rogers.

Inventor:

Edw. Dummer.

2 Sheets—Sheet 2.

E. DUMMER.

Printing-Presses.

No. 197,021. **Patented Nov. 13, 1877.**

Fig. 5.

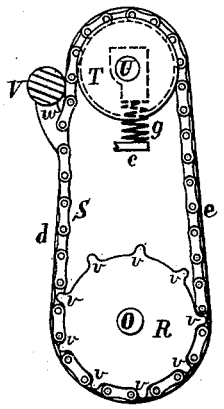
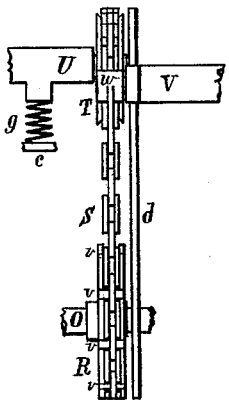


Fig 6.



Attest;

C. Pierson
L. K. Munn.

Inventor;

Edw. Dummer.

UNITED STATES PATENT OFFICE.

EDWARD DUMMER, OF BOSTON, ASSIGNOR OF ONE-HALF HIS RIGHT TO DAVID W. WATSON, OF MALDEN, MASSACHUSETTS.

IMPROVEMENT IN PRINTING-PRESSES.

Specification forming part of Letters Patent No. **197,021**, dated November 13, 1877; application filed March 6, 1877.

To all whom it may concern:

Be it known that I, EDWARD DUMMER, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Printing-Presses, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

The object of my invention is, first, to carry the inking roll or rolls over the form from which the impression is to be taken by means of bands or chains passing about pulleys rotating continuously in one direction; secondly, to so locate the ink-plate in reference to the bed of the press, and so construct the body of the press, that the inking roll or rolls may be carried over the ink-plate by the bands or chains as they continue their movement, as aforesaid; thirdly, to so construct the body of the press, and so arrange the band or chain-pulleys and their bearings, in combination with springs, that the bands or chains shall be kept taut and in position for smoothly working, and shall cause the inking roll or rolls to press upon the form and ink-plate; fourthly, to so arrange the main driven gear and the shaft that bears the cranks, which, in an oscillating press, in conjunction with the side arms, swing the platen and give the impression, that the platen may fall backward from the form or bed more rapidly than it approaches the same, and that the platen may have a cessation of its oscillating movement when at its farthest distance from the form or bed, and also that the oscillation of the platen may be stopped while the motion of the driving parts continues; fifthly, to render the quick backward movement of the platen positive and in proper time by means of a cam and a projection or gear-teeth thereon on the driving-shaft acting on a projection or gear-teeth on the driven shaft.

In the drawings, Figure 1 is an elevation, showing the rear view of an oscillating press embodying my invention, part of the shell-cover and ink-plate being broken away. Fig. 2 is a vertical section taken on and showing what may be seen beyond to the right of line 1 1 of Fig. 1. Fig. 3 is an elevation of one end of the press, the end on the right in Fig. 1, part of the standard or side being broken away. Fig. 4 is an elevation of the end of the press on the left in Fig. 1, part of the standard or side being broken away. Figs. 5 and 6 show the relative positions of the chains or bands, their pulleys, the springs for keeping the chains or bands taut, the inking-roll, and the arms or levers for holding the inking-roll.

The body of the press here represented consists of two parts, each of which may be cast as one piece. One—the main part—consists of the sides or standards A, bed B, with supporting-ribs C, *a*, *b*, and *c*, and ways or ink-roll guides *d*, solid connections D between bed and standards, and cross or staying bar E. The other part is the shell or cover F, bearing the ways or ink-roll guides *e*, and is fixed to the main part by the screws *f* in position to cause the guides *d* and *e* to coincide and meet, as shown.

At the back of the bed B are formed, by the ribs *a* and *b*, the recesses, one on each side, in which are placed the springs *g*. Projections *h* are formed on the inner face of the shell part F, so as to cover the recesses and retain the springs *g* therein. The rib C has formed with it a projection, which has a bearing, *i*, for the stud *j* formed on the ink-plate G. The shell part F has a large opening, circular in this case, that the parts within the space between part F and the main part may be readily adjusted, and which opening is covered when the ink-plate is in place—that is, when the stud *j* is in its bearing *i*.

The platen H, with the cross-bar I bearing the arms and adjusting-screws *k*, oscillates by the supports *l* moving on the pivots at *m*. A shaft, K, bearing the crank-arms J, which are fixed solidly thereto, rests in a bearing, *n*, in one of the standards A and connecting parts D, and in the hub of the gear L. The side arms M are pivoted at *o* to the cross-bar I, and at *p* to the crank-arms J. The gear L is supported by its hub resting in a bearing in the other standard A and connecting part D, and revolves about the same central line with the shaft K, but may revolve independently of the shaft K. A clutch, N, is placed on the shaft

K, and caused to turn therewith by means of the pin *q*, and arranged to slide on the shaft a sufficient distance to be moved in or out of engagement with the projection *r* on the hub of the gear L, by means of the rod *s* extending outside of the body of the press to be grasped by the hand applied at the knob *t*. There is a sufficient distance between the projection on the clutch N and that on the hub of the gear L to allow the shaft K to move a certain distance independently of the gear L, should the shaft move faster than the gear.

On the shaft K is a spur-wheel to catch in the ratchet *u* on the under side of the ink-plate G, to turn the latter intermittingly at the proper time.

O is the main driving-shaft, which may be revolved by any suitable application of power, but here shown as having a crank, P, to be worked by a rod connected with a foot-lever. (Not shown.)

On the shaft O are fastened rigidly the pulleys R, here shown as having sprockets *r* to engage in the chains S, which, as endless bands, pass also over the pulleys T. The latter pulleys revolve independently of each other, and freely on studs, which are extensions of a bar, U. This bar has projections which slide in the recesses for the springs *g*, and are pressed against by the springs *g*, and guided for a slight vertical movement.

The chains S carry the inking-roll V by means of the arms *w*, having the bearings *x* for the inking-roll. The arms *w* are so connected with the chains that a part of each arm forms a link. The form of the arms *w* is such that when the inking-roll passes over the form and ink-plate the chains are drawn a little out of line, the arms *w* acting as levers to press the inking-roll to form and ink-plate, and operated by the chains or bands.

The arrangement of the chains, their pulleys, and inking-roll and levers is more clearly illustrated in Figs. 5 and 6. The sprocket driving-pulleys R are fixed on the driving-shaft O, which runs in fixed bearings, while the pulleys T run on bearings which are pressed upward, or in a direction from the shaft O, by the springs *g*. Hence the chains S are kept taut, and their tendency is to run in straight lines between the pulleys R and T; but the inking-roll V, having its bearings attached to the chains, and the line of the ways *d* and *e*, or of the plane of form and ink-plate, being located at such distance from the chains, the chains are drawn out of said straight lines, and therefore the springs *g* will cause a pressure of the inking-roll on the form and ink-plate. Furthermore, the arms *w*, which bear the inking-roll shaft, are formed to take the place of one or more links—one in this case—so that they also form levers, being drawn or operated by the draft of the chains, as here illustrated.

On the driving-shaft O, and, as here shown, as one piece with the crank P, is the cam W and carrier, having the teeth or projections *y* to engage with the teeth or projections *z* firmly secured to the shaft K. A balance-wheel (not here shown) should be fixed on the other end of the shaft O.

The parts of the press being arranged substantially as shown and described, the operation is as follows: The driving-shaft being revolved by power, as aforesaid, the pulleys R will carry the chains S in the same continuous direction about themselves and the pulleys T. These chains will carry the inking-roll over the form placed on the bed B, then over the ink-plate G, and so on over each alternately, and, as the parts of this press are designed, downward over the form and upward over the ink-plate. The springs *g*, acting against the bar U, will press the pulleys T in a direction from the pulleys R, thus keeping the chains S taut, and causing, owing to the form of the arms *w* and the drawing out of line of the chains as aforesaid, the inking-roll V to press on the form and ink-plate.

The parts of this press are so arranged that in working the press the driving-shaft O will revolve in the direction shown by the arrows, and will carry a pinion, Y, to work in the gear L, one-fourth the size of the latter, and pulleys R of proper size to carry the inking-roll V twice over the form and ink-plate to each revolution of the gear L—that is, to each impression. The clutch N being in position to engage with the hub of the gear L, the driving-shaft being revolved, and the platen H being at its greatest distance from the bed, the crank-arms J will raise the side arms M, and, by means of them, will carry the platen toward the bed, and, with them, forming toggle-joints, will give the pressure for the impression. After the impression is given, the natural tendency of the arms J and arms M is to fall down and the platen away from the bed; but the teeth or projections *z* will rest on the cam W, which is so set on the shaft O, and is of such form, as to allow the arms J to fall gradually and only so fast as the gear L, by means of the clutch N, carries the arms, until the platen has been removed a short and sufficient distance from the form on the bed, when the teeth or projections *y* will engage with the teeth or projections *z*, and the arms and platen will be carried backward more rapidly as the revolution of the shaft O is quicker than the gear L, the clutch N allowing of this motion without being thrown out, as aforesaid. After the platen has been carried to its greatest distance from the bed it will rest there till the gear L again acts on the clutch, when the operation just described will be repeated.

Should the driving-shaft O, and hence the gear L, be revolved in the opposite direction from that just set forth, the clutch being beveled, as shown, the projection on hub of gear L will slide the clutch out of engagement, and the chains S will continue in motion, while the platen will remain at rest. So, by disengaging the clutch by hand, by means of the rod *s*, the movement of the platen toward the bed may be stopped when desired. The cam W

and the pinion Y may be so adjusted in relation to the pulleys R—that is, in relation to the position of the inking-roll V—that while the latter passes over the form twice for each impression it will only pass over the form when the platen is a sufficient distance from the form or bed.

More than one inking-roll may be used.

The inking-rolls may be made to pass over the form only once for each impression by properly proportioning the pulleys, gear, and pinion.

Other forms of chains or bands may be used than those shown, and other forms of connections of the chains or bands with the inking-rolls to accomplish the desired results by substantially the same principles set forth. The form of the teeth *y* and *z* or projections may be varied and accomplish the same result.

I claim as my invention—

1. In an oscillating printing-press, one or more inking-rolls carried over the form or bed and ink-plate by chains or bands, said chains or bands passing about pulleys R on the main driving-shaft O, and the pulleys T, the sets of pulleys being pressed from each other by means of springs *g*, substantially as hereinbefore set forth.

2. The combination of the bed B, revolving disk or ink-plate G, and chains or bands S, passing about pulleys R and T, and carrying the inking roll or rolls, substantially as hereinbefore described.

3. The combination of the chains or bands S, pulleys R and T, springs *g*, and levers *w*, bearing the inking-roll V, substantially as hereinbefore set forth.

4. In an oscillating press, the combination of the gear L, shaft K, bearing the cranks J, and clutch N, substantially as hereinbefore described.

5. The combination of shaft O, cam W, bearing the teeth or projection *y*, shaft K, bearing the teeth or projection *z*, substantially as hereinbefore described.

6. The combination of shaft O, pulleys R, chains or bands S, pulleys T, pinion Y, gear L, shaft K, crank-arms J, side arms N, and oscillating platen H, substantially as and for the purpose hereinbefore set forth.

7. The standards A, bed B, shell or cover F, and ways or inking-roll guides *d* and *e*, constructed and combined substantially as hereinbefore described.

EDWARD DUMMER.

Witnesses:

LOUIS COHEN,

H. W. BRICKER.