(No Model.) 2 Sheets—Sheet 1.

J. A. WETMORE.

ELECTRICAL PRINTING PRESS FEEDER.

No. 322,335. Patented July 14, 1885.

Fig 1

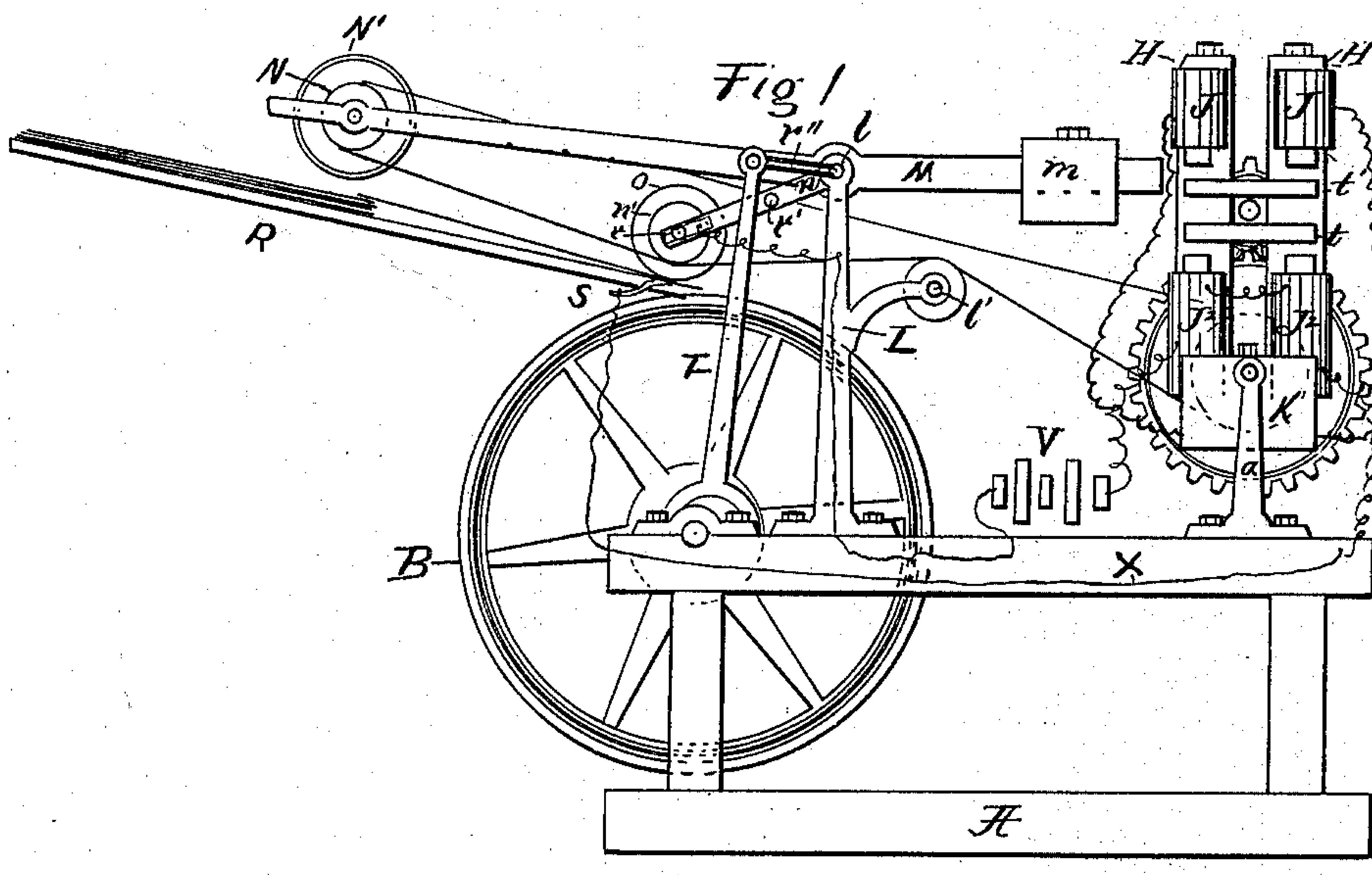
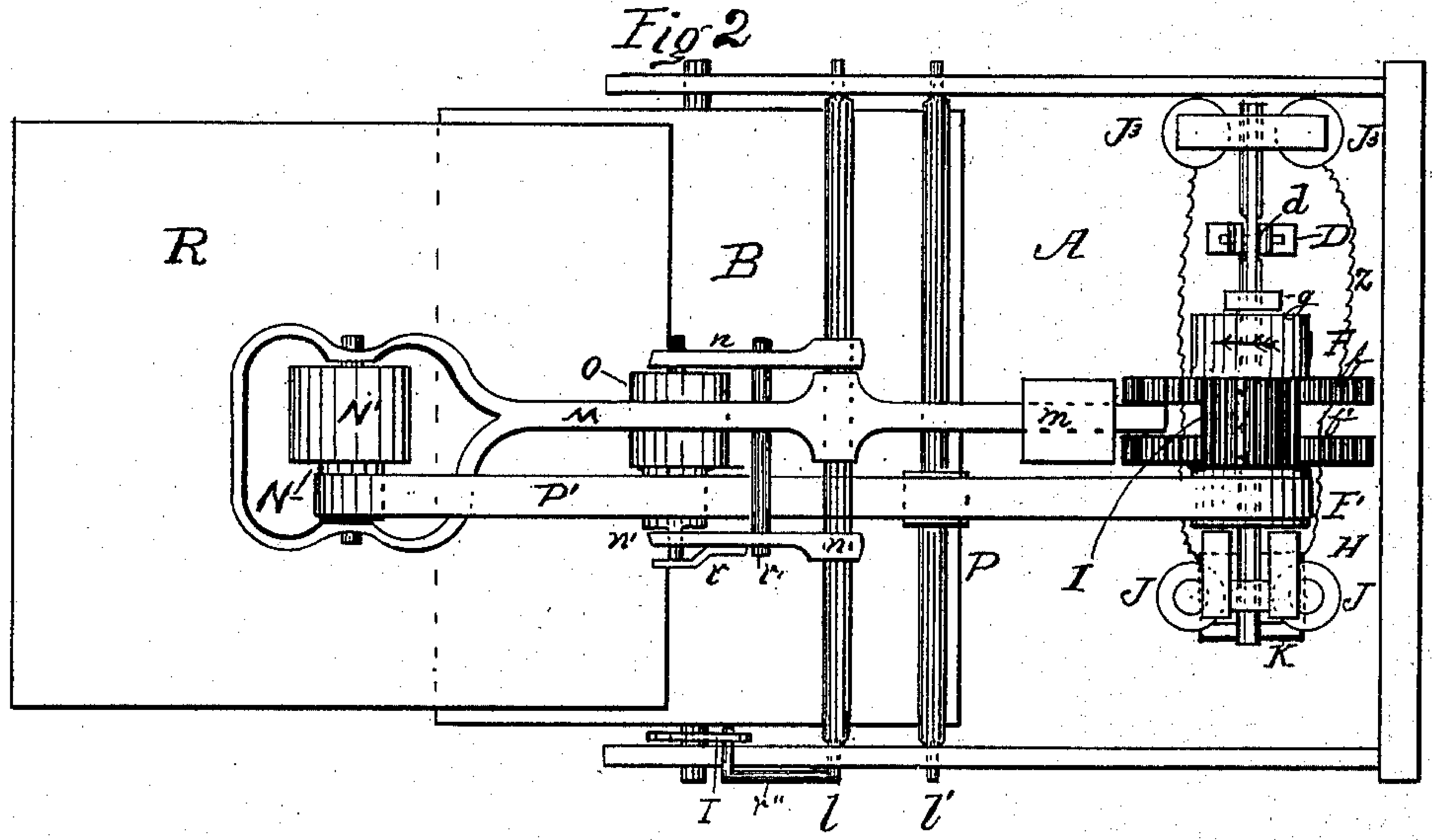


Fig 2



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(No Model.) 2 Sheets—Sheet 2.

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ELECTRICAL PRINTING PRESS FEEDER.

No. 322,335. Patented July 14, 1885.

Fig. 6.

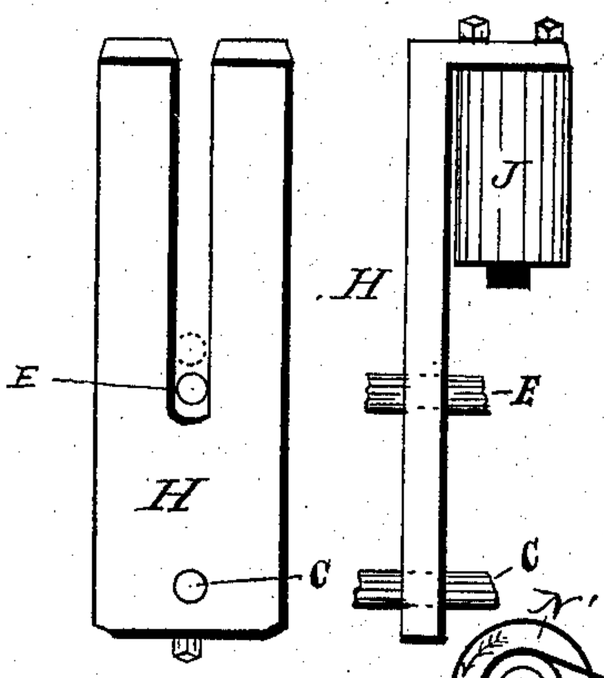

Fig 7

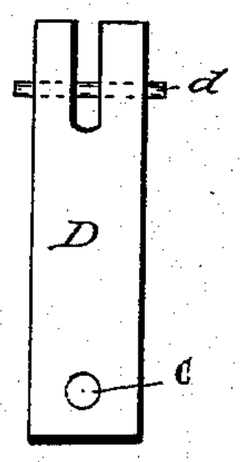

Fig. 3.

Fig 5.

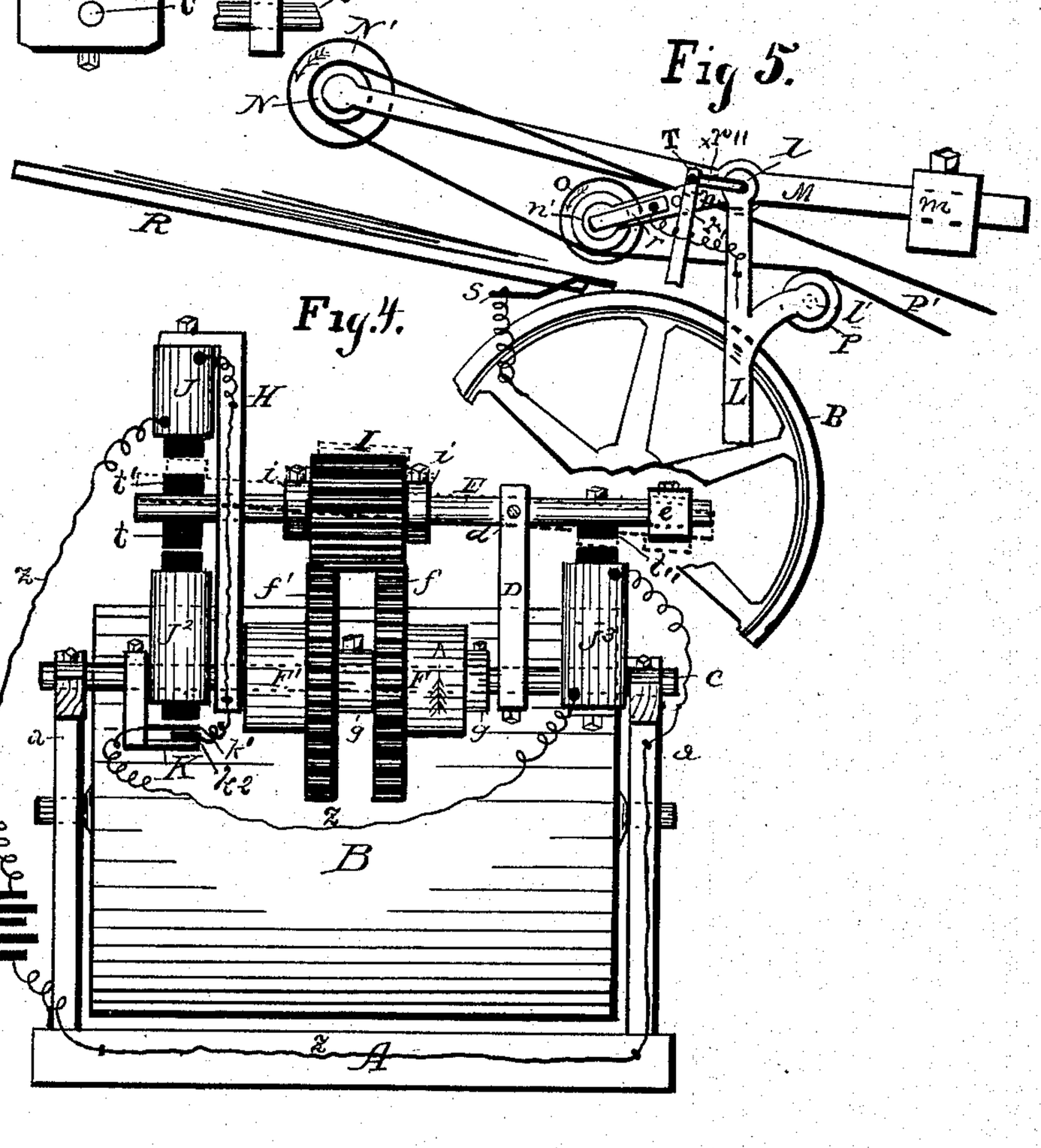

Fig. 4.

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UNITED STATES PATENT OFFICE.

JEAN A. WETMORE, OF BROOKLYN, NEW YORK.

ELECTRICAL PRINTING-PRESS FEEDER.

SPECIFICATION forming part of Letters Patent No. 322,335, dated July 14, 1885.

Application filed January 28, 1884. (No model.)

To all whom it may concern:

Be it known that I, JEAN A. WETMORE, a citizen of the United States, now residing at the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Automatic Electrical Feeders for Printing-Presses, of which the following is a specification.

My invention consists, mainly, in the combination, with the driving mechanism of a printing-press feeder, of one or more electro-magnets adapted, when excited, to hold said driving mechanism in gear, and to release the same when demagnetized, situated in an electrical circuit so constructed as to be broken by each sheet of paper in its advance to the impression-cylinder.

It also consists in the combination, with the driving mechanism and the main electrical circuit and electro-magnets arranged as above specified, of an auxiliary circuit provided with one or more electro-magnets adapted, when excited, to throw and hold said driving mechanism out of gear, and provided with an electrical switch so controlled by an electro-magnet in said main circuit that said auxiliary circuit is broken when said main circuit is closed, and closed whenever said main circuit is broken.

Figure 1 is a side elevation. Fig. 2 is a plan view. Fig. 3 is a detail view of post D. Fig. 4 is an end elevation. Fig. 5 is a detail view of the feed-wheel. Fig. 6 is a detail of the guide-post. Fig. 7 is a side view of Fig. 6.

A represents the frame, and B the impression-cylinder, of a rotary printing-press, all parts of the printing-press not directly connected with the feed device being omitted.

a a represent two upright supports secured to frame A, at opposite sides thereof, and in the upper ends of *a a* is firmly secured a rod, C.

D H represent two upright posts supported by and securely fastened to rod C. The upper end of post D is slotted, as shown in Fig. 3, and post H is deeply slotted and has a right-angled extension at its upper end, as shown in Figs. 6 and 7.

J J represent two electro-magnets bolted to the under side of the right-angled extension of post H, and J^2 J^2 represent two similar electro-magnets secured to rod C, and being below the magnets J J. J^3 J^3 represent another similar pair of electro-magnets secured to rod C, but near the further end thereof, as shown in Fig. 4.

E represents a rod pivoted to the upper end of post D by a pin, *d*, and extending on one end to the electro-magnets J J, and at the other end beyond the magnets J^3. On this end is a counter-weight, *e*, adjustable by means of a set-screw. Rod E extends through the slot in post H, and at a point directly under the cores of magnets J J is provided with an extending armature, *t'*, and a similar armature, *t*, on its lower side, the armature *t* being within the field of magnetic force of the magnets J^2 J^2, and the armature *t'* being within the field of magnetic force of the magnets J J. Rod E is also provided with a similar armature, *t''*, at a point directly over the magnets J^3 J^3.

I represents a toothed pinion, long enough to mesh with the two gear-wheels *f f'* at once, loosely set on rod E, so as to turn freely thereon, and held in place by two collars, *i i*, secured on rod E by set-screws.

F F' represent two belt-pulleys loose on rod C, and *f f'* represent two gear-wheels fastened to said belt-pulleys, respectively. Belt-pulleys F F' and the gear-wheels carried by them are kept in position by the collars *g g* and post H. Pulley F is intended to run constantly, being driven from any suitable source of power, and pulley F' runs only when pinion I is thrown into gear with wheels *f f'*, when the motion of pulley F and wheel *f* is transmitted to wheel *f'* and pulley F'. This device just described performs the same function subserved by a fast and loose pulley and a belt-shipper, but is better suited for the purpose of my invention, because it falls in and out of gear more instantaneously than does a belt.

L represents an upright standard, one of which is secured to frame A at each side of the machine. In the upper ends of these standards L is journaled a shaft, *l*, and in rearwardly-extending brackets on said standards, Figs. 1 and 5, is journaled a shaft, *l'*, which carries an idler-pulley, P.

M represents a bar secured to shaft *l*, having on one end an adjustable counter-weight, *m*, and having its other end, which extends over the table R, on which the blank sheets of paper are piled preparatory to being fed into the press, bifurcated to afford bearings for a shaft which carries a belt-pulley, N, and a feed-wheel, N′, of larger diameter, and either tired with rubber or some elastic substance, or else with a roughened periphery, so that said wheel when rotated on top of one or more sheets of paper lying on table R will adhere to and move the topmost sheet. The bar M is so hung on shaft *l* that it vibrates independently of said shaft, and the forked end is the heavier, so that feed-wheel N′ will constantly rest on table R or the paper thereon unless forced upward.

n n represent two arms rigidly secured to shaft *l*, in the outer ends of which is journaled an insulated shaft which carries a belt-pulley, *n′*, and a metal wheel, O.

r′ represents a rod fastened to arms *n n*, and its purpose is to strike against and raise the forked end of bar M when arms *n n* are raised.

r″ represents a rock-shaft lever, one end of which is rigidly fastened to one end of shaft *l*, the other end being pivoted to the end of an eccentric-rod, T, which is operated by an eccentric on the shaft of cylinder B.

S represents a piece of metal secured to table R and just flush with the upper surface thereof, but insulated therefrom, and so placed that its upper surface is in contact with wheel O when said wheel is lowered.

P′ represents a driving-belt which runs from pulley F′ over pulley N, and the under portion of said belt bears against the under side of pulley *n′* and runs over the idler-pulley P, whereby said belt is tightened when the forked end of bar M is lowered so that the feed-wheel N′ rests upon table R.

V represents an electrical generator, which may be a battery or any other known machine furnishing a continuous current. Generator V is situated in two electrical circuits, one of which I shall call the "main circuit," designated by the letter X, and the other I shall call an "auxiliary circuit," designated by the letter Z.

The main circuit X is made up as follows: From one pole of generator V a wire leads to an insulated spring, *r*, secured to arm *n*, and the free end of the spring is in electrical contact with the insulated shaft which carries wheel O. This wheel O is adapted to make electrical contact with the metal contact-piece S, and from S a wire leads to electro-magnets J^2 J^2, and thence to the other pole of the generator, so that the main circuit includes the generator, wheel O, contact-piece S, and the electro-magnets J^2 J^2.

The auxiliary circuit is made up as follows: From one pole of generator V a wire leads to the electro-magnets J J, and thence a wire runs down post H, and is connected to a piece of metal, k^2, supported from rod C by an insulating-support, K, so that piece k^2 lies directly under the cores of electro-magnets J^2 J^2. Between the cores of said magnets (and within the field of magnetic attraction thereof) and the piece k^2 lies a piece of metal, *k′*, fastened to the insulating-support K, and either hinged thereto or made in the form of a spring, so that its tendency is to make electrical contact with piece k^2. This forms an electrical switch controlled by the magnets J^2 J^2, for these magnets when excited attract piece *k′* and hold the switch open, and as soon as the magnets are demagnetized the piece *k′* returns to its contact with piece k^2 and closes the switch. From piece k^2 a wire leads to the electro-magnets J^3 J^3, and thence to the other pole of the generator, so that the auxiliary circuit Z includes the generator, the electro-magnets J J J^3 J^3, and the switch.

It is evident that both circuits cannot be closed at the same time, for whenever the main circuit is closed the influence of the electro-magnets J^2 J^2 opens the switch and holds it open so long as a current is passing through the main circuit. It is also evident that whenever the main circuit is broken the switch closes automatically, and thus closes the auxiliary circuit. The wires of both circuits are insulated wire.

The operation of my invention is as follows: A pile of sheets of paper is placed on the table R under feed-wheel N′, and shaft *l* is adjusted so that feed-wheel N′ is permitted to rest on the paper, and wheel O comes in contact with metal piece S. The press and generator are now started. As long as the main circuit X is closed the current from the generator will flow through said main circuit, breaking the auxiliary circuit at the switch, as explained, and the electro-magnets J^2 J^2 will attract the armature *t* on rod E and hold the coupling-pinion I firmly in gear with wheels *f f′*. The wheel *f* is constantly driven, as before stated, and its motion is communicated to wheel *f′*, which turns the pulley F′, thus driving the belt P′ and turning pulleys *n′* N. As the feed-wheel N′ rotates it pushes the uppermost sheet of paper along the table toward the impression-cylinder until finally the paper passes between the contact-piece S and wheel O, and being a non-conductor of electricity breaks the main circuit X at this point. This stops the flow of the electric current through the main circuit, and the electro-magnets J^2 J^2 become demagnetized and cease to attract the armature *t* or the piece K′ of the switch. The switch closes automatically, thus closing the auxiliary circuit. The current flows through the auxiliary circuit, magnetizes the cores of the electro-magnets J J J^3 J^3, and these magnets attract the armatures *t′ t″* on rod E and swing said rod into the position shown in dotted lines in Fig. 4, so that the pinion I is lifted away from the gear-wheels *f f′* and no longer transmits power to wheel *f′*, which in turn ceases to actuate pulley F′, belt P′, and pulleys *n′* N, and wheels N′ O cease to revolve.

The impression-cylinder B carries the usual nippers to grasp and draw a sheet of paper into the press, and the eccentric is so adjusted on the cylinder-shaft that just as the nippers grasp the sheet of paper which has been fed forward, as described, the eccentric raises the eccentric-rod T, which forces upward the end of lever r'' and rock-shaft l, and this raises the outer ends of arms $n\ n$ and wheel O. As arms $n\ n$ rise the cross-bar r' strikes the under side of bar M and lifts the feed-wheel N′ off from the paper.

The continuing revolution of the cylinder-shaft lowers the eccentric-rod T, and as the sheet of paper previously fed has been removed and no longer covers piece S, wheel O in its descent comes in contact with piece S, the main circuit is again closed, the electro-magnets $J^2\ J^2$ open the switch in the auxiliary circuit and thus break said circuit, the electro-magnets $J\ J\ J^3\ J^3$ are demagnetized and no longer attract the armatures $t'\ t''$, and magnets $J^2\ J^2$ again attract armature t and throw coupling-pinion I into gear with the wheels $f\ f'$, thus starting the feed-wheel and repeating the operation already described.

If the cylinder B is intended to operate upon more than one sheet of paper in each revolution, the eccentric on the cylinder-shaft must be replaced by as many cams as the sheets to be printed at each revolution, each cam adjusted to raise the eccentric-rod T at the proper point above described.

It is evident that, instead of the gear-wheels $f\ f'$ and coupling-pinion I, the common mechanical device—in this case mechanical equivalent—of a fast and loose pulley may be used, and the rod E may operate an ordinary belt-shipper or an ordinary clutch.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the driving mechanism of an automatic feeder for printing-presses, of one or more electro-magnets adapted, when excited, to hold said driving mechanism in gear, situated in an electrical circuit which crosses the path of the advancing paper, whereby said circuit is broken by each sheet of paper in its advance to the impression-cylinder.

2. The combination, with the driving mechanism of a printing-press feeder, of one or more electro-magnets adapted, when excited, to hold said driving mechanism in gear, situated in an electrical circuit which crosses the path of the paper on its way to the impression-cylinder, whereby said circuit is broken by each sheet of paper in its advance to the impression-cylinder, and of one or more electro-magnets adapted, when excited, to throw and hold said driving mechanism out of gear, situated in an electrical circuit containing a switch controlled by an electro-magnet in said first or main electrical circuit, whereby said switch is held open as long as a current is passing through said main circuit, and closes by gravity or the action of a spring when said main circuit is broken, and of an electrical generator connected in said circuits.

3. In combination with the driving mechanism of a feeder for a printing-press, the electrical generator V, the electrical circuit X, passing through one or more electro-magnets adapted, when excited, to hold said driving mechanism in gear, and completed by two contact-points between which each sheet of paper passes on its way to the impression-cylinder, thereby breaking said circuit, and of the auxiliary circuit Z, passing through one or more electro-magnets adapted, when excited, to throw and hold said driving mechanism out of gear, and completed by a switch, $k'\ k^2$, controlled by an electro-magnet in circuit, X, substantially as shown and described.

4. In a printing-press feeder, the combination of the electrical contact-piece S, contact-wheel O, the point of mutual contact being on the line of the advancing paper, the rock-shaft l, carrying arms $n\ n$, lever r'', eccentric-rod T, and an eccentric on the impression-cylinder, whereby when contact between S and O is temporarily broken by a sheet of paper the wheel O is raised to permit free removal of said paper, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

JEAN A. WETMORE.

Witnesses:
GEO. H. ANGELL,
GEO. E. HERRICK.