(No Model.) 2 Sheets—Sheet 1.

D. I. ECKERSON.

FEED MECHANISM FOR PRINTING PRESSES.

No. 457,188. Patented Aug. 4, 1891.

Fig. 1.

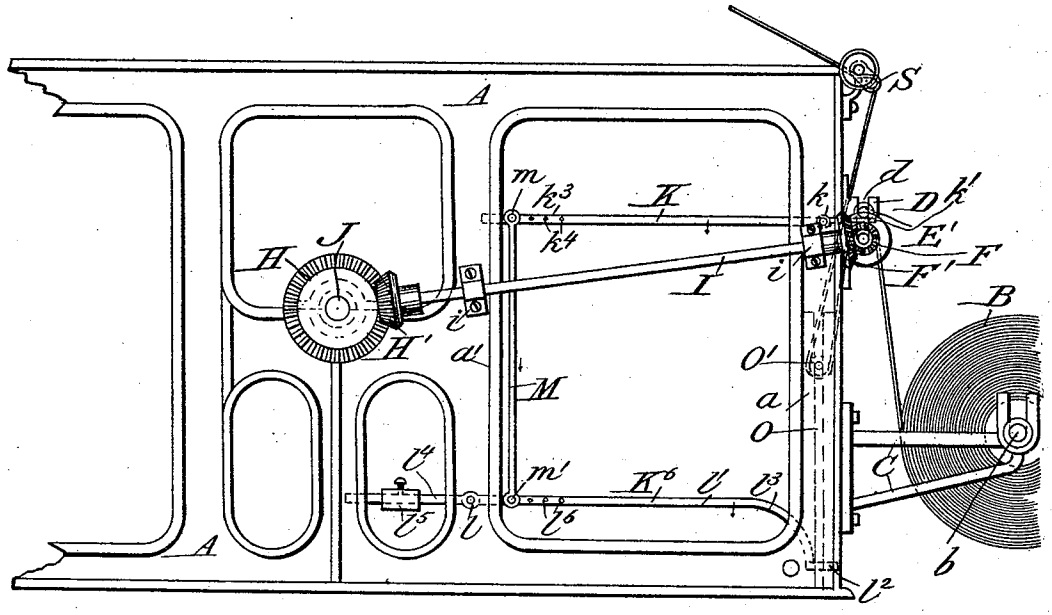
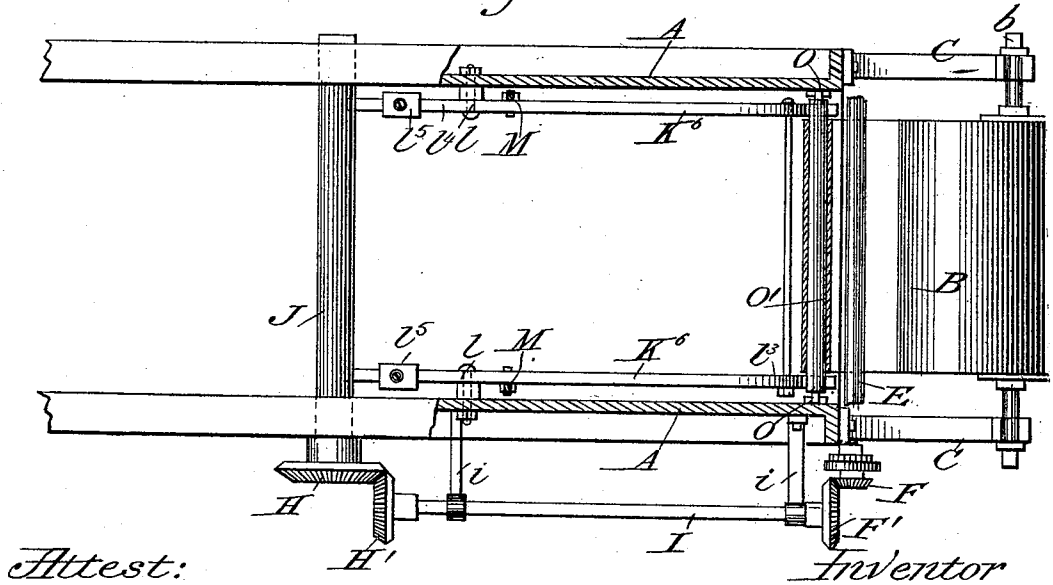


Fig. 2.



Attest:

H. H. Schott

Wm. L. Boyden

Inventor

David I. Eckerson

by M. T. E. Chandlee & Co

Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

D. I. ECKERSON.

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Fig. 4.

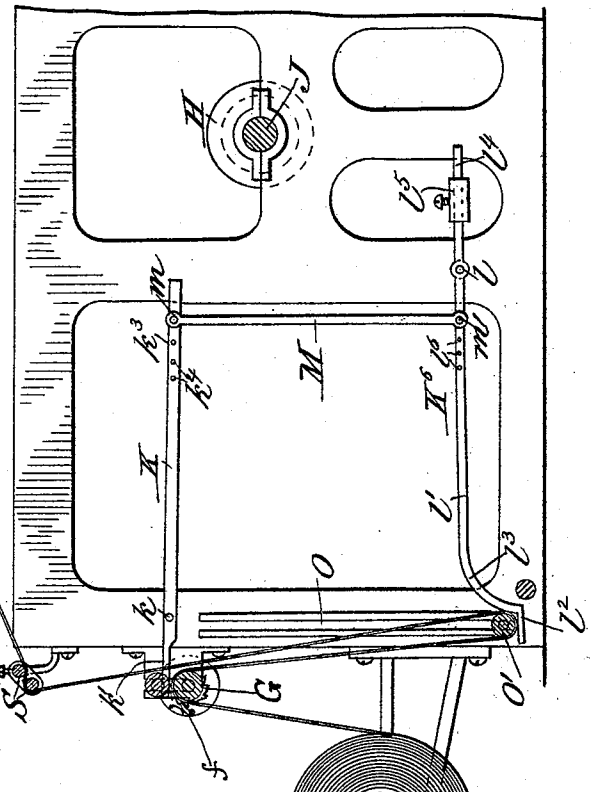


Fig. 3.

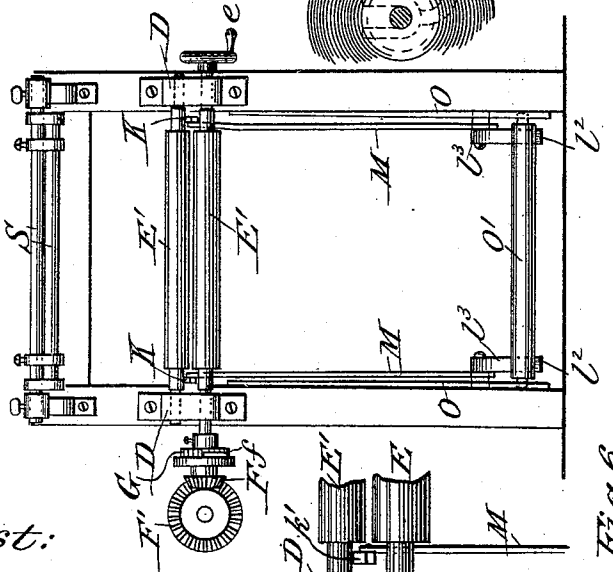


Fig. 5.

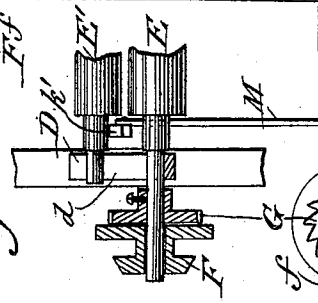
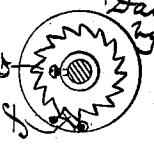


Fig. 6.



Attest:

J. H. Schott

Wm. L. Boyden

Inventor

David I. Eckerson

by M. T. E. Chandlee

Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

DAVID I. ECKERSON, OF WORCESTER, NEW YORK.

FEED MECHANISM FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 457,188, dated August 4, 1891.

Application filed March 21, 1891. Serial No. 385,886. (No model.)

To all whom it may concern:

Be it known that I, DAVID I. ECKERSON, a citizen of the United States, residing at Worcester, in the county of Otsego and State of New York, have invented certain new and useful Improvements in the Feed Mechanism for Printing-Presses; and I do 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 the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in printing-presses of that class which are provided with an intermittent feed, such as is described in patent numbered 433,776, granted to me August 5, 1890, which between each impression of the press draws the necessary supply of paper between the impressing-surfaces, and has for its object the construction of an auxiliary feed which will automatically draw enough of paper from the roll to have a sufficient quantity freely suspended in a loop, so that it can readily and quickly be drawn into the press, whereby the danger of tearing the paper, which would be incurred by its being drawn suddenly from the roll by the intermittent feed, is avoided.

The invention consists in providing an auxiliary feed to which the web from the roll passes before it is seized by the intermittent feed which draws it between the impressing-surfaces. This auxiliary feed consists of a pair of rollers which have their shafts journaled in bearings, one above the other, in which they have a free vertical movement. The lower roller by its weight will always remain in the lower part of the bearings and is continuously rotated. The upper roller normally will rest upon the lower roller. The web passes from the roll between these rollers, and the friction between the continuously-rotated roller and the web produced by the pressure of the upper roller will be sufficient to draw the paper forward. The lower roller is so geared that if it drew the web continuously it would draw off enough of paper to more than supply the demand of the press. To regulate the supply so that the proper amount will be drawn off the roll, means are provided whereby the upper roller will be automatically raised from contact with the paper and decrease the friction between the lower roller and the paper, so that the drawing off of the paper will cease, and when the supply has been taken by the intermittent feed the upper roller will be lowered and cause the drawing off of the web to again commence. The means for raising and lowering the upper roller consist of a system of levers which are adapted to be operated by the weight of the loop of paper suspended between the auxiliary feed and the intermittent feed and of an idler-roller carried in the said loop.

The invention further consists of the novel construction, combination, and arrangement of parts, as will be hereinafter more fully described, pointed out in the appended claims, and illustrated in the accompanying drawings.

In the accompanying drawings, in which similar letters of reference designate corresponding parts, Figure 1 is a side elevation of a printing-press embodying the invention, only showing, however, those parts which are necessary to illustrate the device and its operation. Fig. 2 is a horizontal section below the upper feed-roller. Fig. 3 is a front elevation. Fig. 4 is a longitudinal vertical section. Fig. 5 is an elevation, partly in section, showing the bevel-gear and ratchet-wheel through which motion is given to the lower roller from a shaft driven by the main driving-shaft. Fig. 6 is a side elevation of the ratchet-wheel and pawl.

Referring to the drawings, A A designate the side frames or supports of a printing-press, having the front standards *a a* and the intermediate standards *a' a'*.

B is a roll of paper carried on a spindle *b*, supported by the brackets C C and in a suitable position to allow the web to be fed into the machine.

D D are brackets secured, one on each side, to the standards *a a* of the side frames, and are each provided with an elongated bearing *d*.

E and E' are the rollers which form the auxiliary feed and have the ends of their shafts journaled in the bearings of the brackets *d d*, one above the other. Mechanism which will be described hereinafter is pro-

vided, so that the auxiliary feed will operate automatically to intermittently draw the necessary amount of paper from the roll as it is needed by the press. The lower roller is provided with means which will rotate it continuously. This continuous rotation by itself would not draw the web from the roll, as the friction between the paper and the roller would not be sufficient. To give the necessary friction the roller E′ is provided. This roller normally presses the paper upon the lower roller and rotates with the latter. The lower roller is continuously rotated by the mechanism which will now be described. Loosely journaled on a projecting end of the shaft of the lower roller E is a bevel-gear F, having attached to its inner side a spring-pressed pawl *f*.

G is a ratchet-wheel secured on the end of the shaft back of the bevel-gear and with which the pawl *f* is adapted to engage. The object of having this pawl and ratchet-wheel attachment is to allow the rotation of the lower roller by the hand-wheel *e*.

J is the main driving-shaft of the machine, and H is a bevel-gear secured to an end of the said shaft which projects from its bearing in the side frame on the same side of the machine as the bevel-gear F. Motion is transmitted from the bevel-gear H to the bevel-gear F by the shaft I, carried by the brackets *i i*, projecting from the side frame and to the ends of which are secured the gears H′ and F′, which mesh, respectively, with the bevel-gears H and F.

By the above-described mechanism the lower roller is rotated continuously and would, if the friction between it and the paper was great enough, draw the paper continuously from the roll; but, as stated before, the friction is not great enough, and the roller E′ is provided to increase the friction. This roller E′ is freely rotatable in its bearings and is turned by frictional contact of the web passing between it and the lower roller. If no provision was made for preventing it, the feed would be continuous, and it would require a very fine adjustment of the driving mechanism to supply the necessary amount of paper. In place of supplying means for such an adjustment I gear the different wheels and shafts between the lower roller and the driving-shaft, so that if the web should be drawn off the whole time that the lower roller rotates more than enough of paper would be supplied, and provide the mechanism hereinafter described, which will automatically regulate the pressure of the upper roller on the web passing between it and the lower roller, thereby regulating the friction and in consequence the feed.

The auxiliary feed operates almost continuously, and is so regulated that it will draw the paper from the roll at such a speed that the web will hang in a loop which will vary in length between the auxiliary and the intermittent feeds. The object of this loop is to have a sufficient quantity of free paper ready to be drawn rapidly into the press. If the web should be drawn directly from the roll by the intermittent feed, the strain which would be suddenly exerted on the paper would tend to tear and break it. This strain so exerted would be quite severe, as the inertia of the heavy stationary roll would have to be overcome, and, furthermore, after the roll has been put in motion its momentum would cause it to continue rotating and wind off more than enough of paper. This would necessitate the use of a brake, which would be an addition to the resistance to the starting of the roll, thereby increasing the tendency which the paper would have to being torn. To overcome these objections, I provide means which will automatically raise the upper roller if the supply becomes too great, and which will lower the said roller when the supply is used. The mechanism for accomplishing this purpose will now be described.

K K are levers fulcrumed near the front ends on the bolts *k k*, projecting from the inner sides of the side frames, and are held at a proper distance from the said frames by the washers k^2 k^2. Their front ends *k′ k′* project forward under the ends of the roller E′. The rear ends k^3 k^3 extend a considerable distance into the machine and are free to move slightly in their respective vertical planes.

Below the levers K K in the lower part of the machine are the levers K^6 K^6, pivoted near their rear ends at *l l* to the intermediate standards of the side frames. The front ends *l′ l′* extend forward to the front of the machine and are curved downwardly at l^3 l^3 and have their ends formed into steps l^2 l^2. On the short rear arms l^4 l^4 of these levers are adjustably secured the counterpoises l^5 l^5, the purpose of which is to elevate the front ends of the levers. The force with which they will act is governed by the distance at which they are placed from the pivotal points.

M M are links which connect the two pairs of levers. Each link is attached at its upper end to one of the levers K K at a point *m* back of the pivotal point *k* and near the rear extremity of the lever. It is also attached at its lower end to that one of the lower levers which is immediately below the upper lever, to which its upper end is attached at a point *m′* in front of the pivotal point *l*.

On the inner sides of the front standards of the side frames are grooves or guides O O, in which are carried the ends of the shaft of the idler-roller O′. This roller would, if unrestrained, rest upon the steps l^2 l^2 of the levers K^6 K^6. The weights on the rear ends of the levers K^6 K^6 are so adjusted that a slight pressure of the roller upon the steps will depress the front ends of the levers. This depression will, through the connecting-links M M, elevate the front ends of the levers K K, and in consequence the upper roller E′. The upper and lower levers are provided, respectively, with holes k^4 k^4 and l^6 l^6, so that the

distances from the pivotal points of the levers at which the links are attached may be varied and thereby vary the speed with which the roller E′ will be raised or lowered.

The web passes from the roll between the rollers of the auxiliary feed around the idler-roller to the tension-bars S S, and thence to the intermittent feed, which draws it between the impressing-surfaces of the press. If too much paper should be drawn from the roll and the loop become too long, the weight of the idler-roller and of the paper by coming in contact with and resting on the steps of the lower levers would, through the intermediate links and levers, raise the upper of the auxiliary feed-rollers. This would reduce the friction between the web and the lower roller to the extent that the drawing of the paper from the roll would cease. On the shortening of the loop, which would relieve the outer ends of the lower levers of the weight of the paper and the idler-roller through the action of the counterpoises, the upper roller of the auxiliary feed would be lowered and an additional supply of paper be drawn from the roll.

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

1. In a printing-press, the auxiliary feed consisting of two rollers located one above the other, the lower of which is continuously rotated and the upper intermittently, and the means for raising and lowering the upper roller, consisting of the levers pivoted near their forward ends at points near the upper roller and having the said ends extending under the ends of the said roller and their rear ends backward into the machine, the levers pivoted near their rear ends at points in the interior of the machine-frame and below the first-mentioned levers and having their front ends extending to the front of the machine, the links adjustably connecting the upper with the lower levers, the tension-bars, the web carried by the auxiliary feed-rollers and the tension-bars and falling in a loop between the same, and the idler-roller carried by the said loop, substantially as described.

2. In a printing-press, the auxiliary feed consisting of the rollers located one above the other, the lower of which is continuously rotated and the upper intermittently, and the means for raising and lowering the upper roller, consisting of the levers pivoted near their forward ends at points near the upper roller and having the said ends extending under the ends of the said roller and their rear ends backward into the press, the levers pivoted near their rear ends at points in the interior of the press and below the first-mentioned levers and having their front ends extending to the front of the machine, the links connecting the rear ends of the upper levers with the front ends of the lower levers, the tension-bars, the web carried by the auxiliary feed-rollers and the tension-bars and falling in a loop between the same, and the idler-roller carried by the said loop, substantially as described.

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

DAVID I. ECKERSON.

Witnesses:
M. J. MEHAN,
FRANCIS HENDERSON.