(No Model.) 2 Sheets—Sheet 1.

H. P. FEISTER.

PRINTING PRESS.

No. 267,172. Patented Nov. 7, 1882.

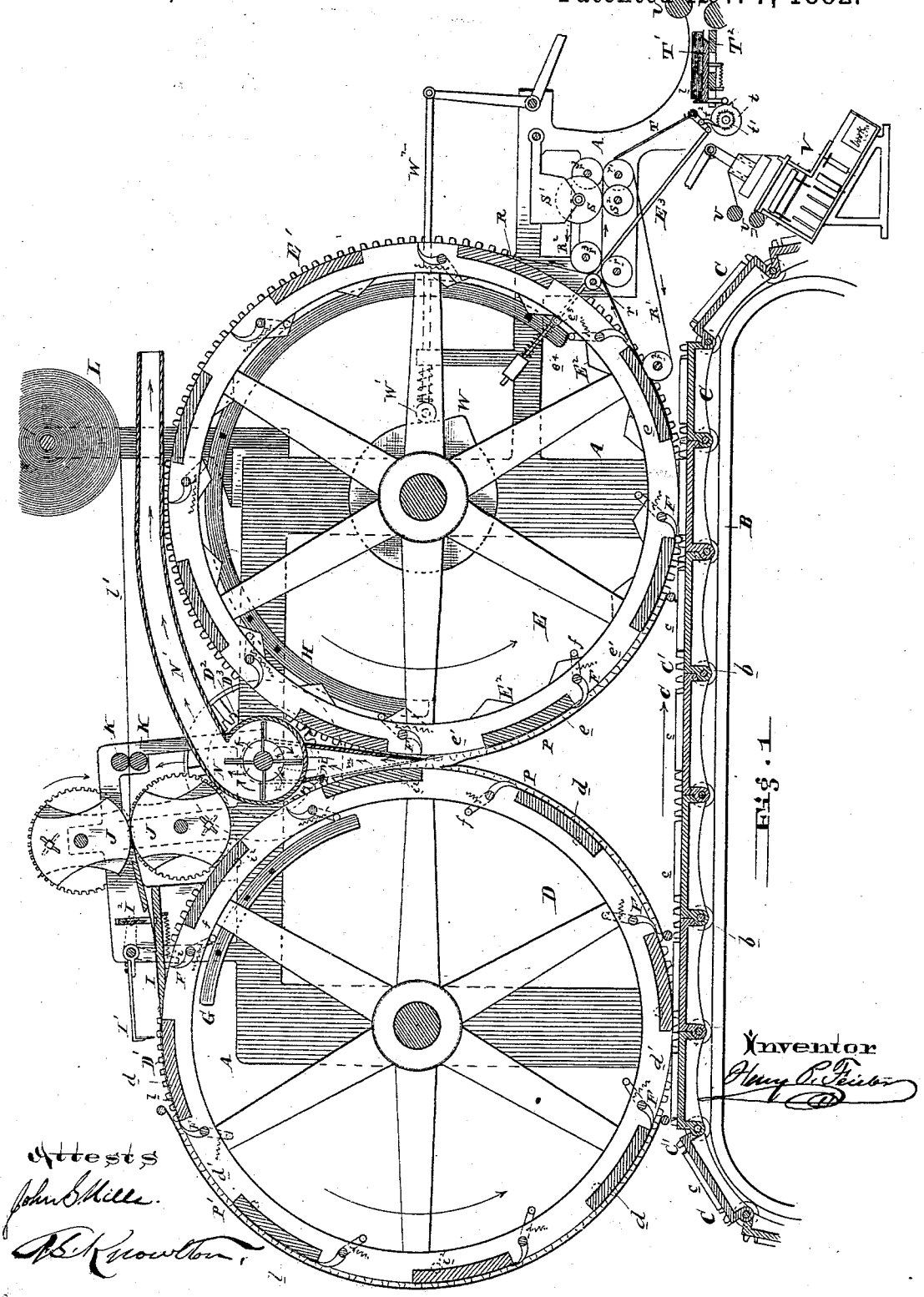

Fig. 1.

Witnesses
John S. Miller.
B. K. Knowlton.

Inventor
Henry P. Feister

(No Model.) 2 Sheets—Sheet 2.

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PRINTING PRESS.

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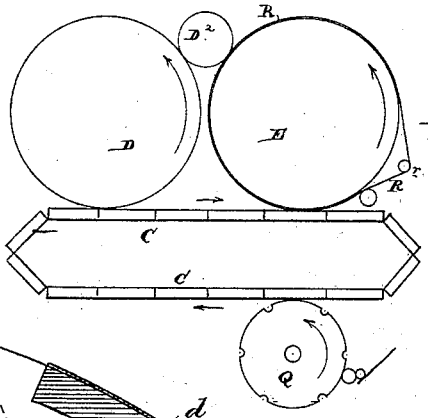

Fig. 3

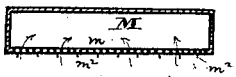

Fig. 4

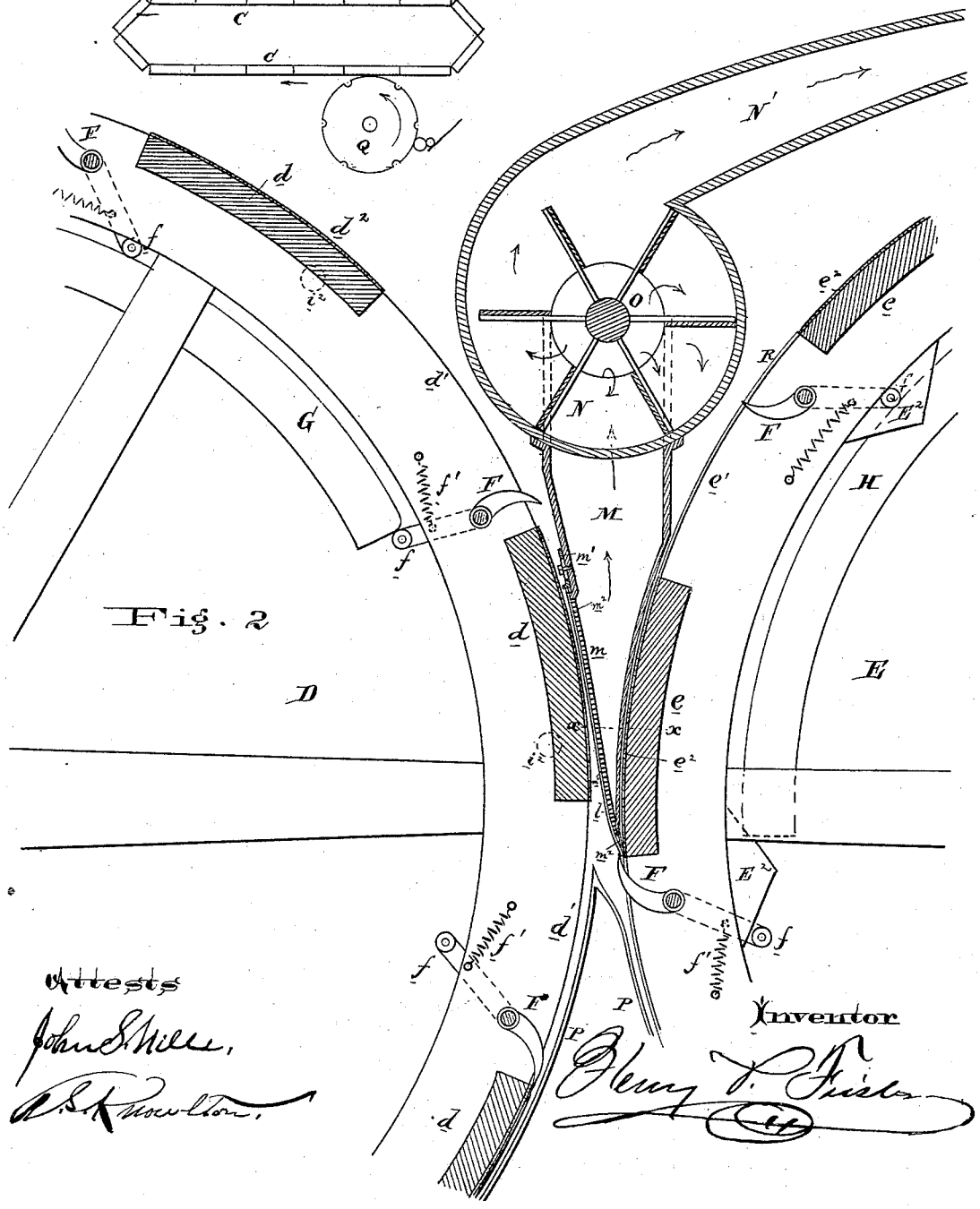

Fig. 2

Attests

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A. D. L. Moulton.

Inventor

Henry P. Feister

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UNITED STATES PATENT OFFICE.

HENRY P. FEISTER, OF PHILADELPHIA, PA., ASSIGNOR OF TWO-THIRDS TO ISAAC FINE AND ISAAC S. SHARP, BOTH OF SAME PLACE.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 267,172, dated November 7, 1882.

Application filed June 2, 1882. (No model.)

To all whom it may concern:

Be it known that I, HENRY P. FEISTER, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Printing-Presses, of which the following is a specification, reference being had to the accompanying drawings, which form part thereof.

My invention has reference to printing-presses in general, but more particularly to combined printing and binding machines; and it consists in the arrangement of two impression-cylinders with an endless chain of type-form carriages, said cylinders being so arranged as to print from alternate type-carriages, or one printing from the type unprinted from by the other cylinder, and a suction device arranged between said cylinders, through the agency of which the paper from one cylinder is transferred to the other, whereby it is reversed to be printed upon both sides, and in many details of construction, as fully specified hereinafter.

This invention is an improvement upon Letters Patent granted to me April 18, 1882, No. 256,662, and particularly relates to the means by which the sheets of paper are reversed, said means taking the place of the nippers and their auxiliary mechanism in the patent above referred to.

The object of this invention is to provide means to automatically transfer sheets from one cylinder to another of a printing-machine.

In the drawings, Figure 1 is a sectional elevation of my improved printing and binding machine with part of the type-form carriages and the inking-cylinder broken away. Fig. 2 is an enlarged sectional view of the suction mechanism through the agency of which the paper is transferred from one cylinder to the other, and Fig. 3 is a diagram illustrating the relative arrangement of the various parts. Fig. 4 is a cross-section of suction box and plate on line *x x* of Fig. 2.

A is the frame of the machine. B is an endless guide-bed secured to said frame, and upon which the rollers *b*, carrying the endless chain of type-form carriages C, are adapted to run. These carriages C are provided with the type-forms *c*, and upon one or both sides with rack C′, which mesh with the teeth D′ and E′ on the impression-cylinders D and E, and from which said type-carriages receive their motion. These impression-cylinders are two in number, and are lettered D and E. They are respectively provided with impression-surfaces *d* and *e*, and also with spaces *d′* and *e′*. The impression-surfaces are provided with make-readies d^2 e^2, and are equal in number to the number of type-form carriages C, those *d* printing from every alternate carriage, and those *e* printing from the carriages omitted. Therefore each of the impression-cylinders prints from one-half of the entire number of type-form carriages. The forward ends of each of the impression-surfaces *d* and *e* are provided with nippers F, adapted to hold one end of the paper sheets and cause them to be carried around by said impression-cylinders and between them and the type on the carriages. These nippers may be actuated by arms *f*, carrying on their ends friction-rollers, cams G H, and springs *f′*.

P P′ are guides to prevent the paper sheets from being blown away or falling away from the make-readies.

L is a roll of paper, and is guided in a continuous sheet, *l′*, to the feed-rollers J J′ by the rollers K. The feed-rollers may consist of a series of notched disks, J, bolted together, by which their feed-surfaces may be increased or diminished. From the feed-rollers the paper is fed under the knife I^2 upon the table I and against the stop I′. The knife then cuts it off into a sheet, and as the impression-surface *d* comes around the pin i^2 strikes the arm of stop I′ and raises it clear of the paper sheet *l*, and at the same time the arm *f* runs off cam G, and the nippers F are drawn down by spring *f′* and catch the end of the sheet and carry the same with the rotating cylinder. Each impression-surface receives a sheet of paper as it passes the table I. The sheet is then carried down, the guide P′ preventing its displacement. It then passes over the type *c* of the carriages C, which have been previously inked by the inking-cylinder Q, and is printed upon one side. It is then carried up, and is prevented from falling away by the guide P, and when drawn up in front

of the suction-plate *m* upon the ribs or fins (to prevent blurring) of the air-box M, and through which air is constantly sucked, it is arrested by an adjustable stop, *m'*, and at the same instant it is freed by the nippers F through the agency of the cam G. The paper is held by suction up close to the perforated suction plate or surface *m*, and the end of the sheet at the bottom hangs over the end of the air-box and is drawn toward the cylinder E, as shown in Fig. 2, and rests against guide-fingers m^2 to prevent the edge of the paper being turned up under the bottom of said air-box. The air is sucked from box M by a fan, N, attached directly to the driving-shaft O of the machine; or it may be driven by auxiliary means. The air is blown off by tube or trunk N' out of the way of the sheets of paper. The shaft O is provided with the small intermediate spur-wheel, D^2, which meshes with the teeth D' and E' of the respective impression-cylinders, causing them to move in the direction of the arrows, and the said shaft is rotated by a band-wheel, D^3. Just as the paper sheet *l* has been received on the suction-plate the bottom of the sheet is caught by nippers F of impression-surface *e* of cylinder E, the arm *f* of said nippers being freed from the cam H at that instant. The sheet is then drawn down, and is kept in position by guide P, and is once more passed over the type *c* on the carriages C; but the sheet has been reversed, and now is made to take an impression from one of the type-forms skipped by impression-cylinder D. After being printed upon both sides of the sheet, it is carried up a short distance and freed from the nippers by the cam H, and is carried away from the cylinder by the tapes or bands R, which encircle the cylinder E and idler-roller *r*. It first passes between the bands R R' and then the bands R R^2, and under the pasting or fastening wheel S and over the supporting-wheel S^2. S' is the paste-vat. The bands or tapes R' R^2 run respectively around rollers *r'*, r^2, and r^3. The sheet is then fed to the fly-frame T, which is oscillated or vibrated by rod E^3, spring e^4, and cam-projections E^2 on wheel or cylinder E. The fly-frame folds the sheets down upon the table T', adapted to reciprocate, and resting upon frame T^2. After a complete revolution of the cylinder E the pawl t^2 has rotated the ratchet-wheel *t'* one revolution and the fly-frame has deposited the full number of sheets to make a book upon a back which was placed upon the table T'. The cam *t* then strikes the table T', or a projection on it, and forces the sheets between the rollers U U, which compress them, making them stick fast to each other, and runs the sheets upon the slotted table of the folding and trimming machine V, when the sheets are first doubled by the folding-knife actuated by rod W^2, provided with friction-roller W' and cam W, fast to the cylinder E.

I do not limit myself to the particular construction shown, as it may be modified in various ways self-evident to any intelligent mechanic, and any of the well-known folding and trimming devices may be used.

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

1. In a printing-machine, two impression-cylinders provided with a series of impression-surfaces and make-readies, in combination with an endless chain of type-form carriages, mechanism, substantially as described, to feed the paper to the impression-surfaces of one cylinder, and means, substantially as described, to automatically transfer said paper from one of said impression-cylinders to the other after it has been printed upon on one side.

2. In a printing-machine, two impression-cylinders provided with a series of impression surfaces and spaces, and an endless chain of carriages adapted to carry the type-forms, one of said cylinders printing from every alternate type-form and the other printing from those omitted, in combination with means, substantially as described, to feed paper sheets to the impression-surfaces of one cylinder, and a suction delivery and feed for said sheets of paper from one cylinder to the other after they have been printed upon on one side.

3. In a printing-machine, two impression-cylinders provided with a series of impression surfaces and spaces, said surfaces being furnished with automatically-acting nippers to hold the paper, and an endless chain of type-form carriages, one of said cylinders printing from every alternate type form or carriage and the other printing from those omitted, in combination with mechanism, substantially as described, to feed paper sheets to one of said cylinders, and means, substantially as described, to automatically transfer said paper from one of said impression-cylinders to the other, reversing the said sheet, after it has been printed upon on one side.

4. In a printing-machine, two impression-cylinders provided with a series of impression surfaces and spaces, said surfaces being furnished with automatically-acting nippers to hold the paper, and an endless chain of type-form carriages, one of said cylinders printing from every alternate type-carriage and the other printing from those omitted, in combination with mechanism to feed paper sheets to one of said cylinders, and upon which the sheets are held by the nippers, a suction-plate adapted to receive and hold the sheets after having been printed upon on one side, and to feed them to the other cylinder, mechanism to actuate said nippers upon one cylinder to free the paper when before the suction-plate, and mechanism to cause the nippers on the other of said cylinders to clamp the paper and draw it off said suction-plate and cause it to be printed upon on the other side, and means to create a suction, all substantially as set forth.

5. In a printing-machine, the combination of cylinders D and E, having surfaces *d* and *e* and spaces *d'* and *e'*, type-form carriages C,

nippers F, means, substantially as described, to actuate said nippers, suction box or trunk M, having suction-plate *m*, fan N, and a trunk, N′, substantially as described.

6. In a printing-machine, the combination of cylinders D and E, having surfaces *d* and *e* and spaces *d′* and *e′*, type-form carriages C, nippers F, means, substantially as described, to actuate said nippers, suction-box M, having suction-plate *m*, adjustable stop *m′*, and fan N, substantially as specified.

7. In a printing-machine, the combination of cylinder E, having surfaces *e* and spaces *e′*, nippers F, means to actuate said nippers, endless bands or tapes R, R′, and R², supported upon band-wheels, and means to receive and bind said sheets into book form, all substantially as specified.

8. In a printing-machine, the combination of cylinders D and E, having surfaces *d* and *e* and spaces *d′* and *e′*, type-form carriages C, nippers F, means to actuate said nippers, suction-box M, having suction-plate *m*, fan N, guides P and P′, means to feed the paper sheets to one cylinder, and means to deliver the said sheets from the other cylinder, all substantially as specified.

9. In a printing-machine, the suction-box arranged between two impression-cylinders, provided with a perforated suction-plate having fins or ribs, upon which the paper rests, to prevent blurring, substantially as shown.

In testimony of which invention I hereunto set my hand.

HENRY P. FEISTER.

Witnesses:
R. A. CAVIN,
R. S. CHILD, Jr.