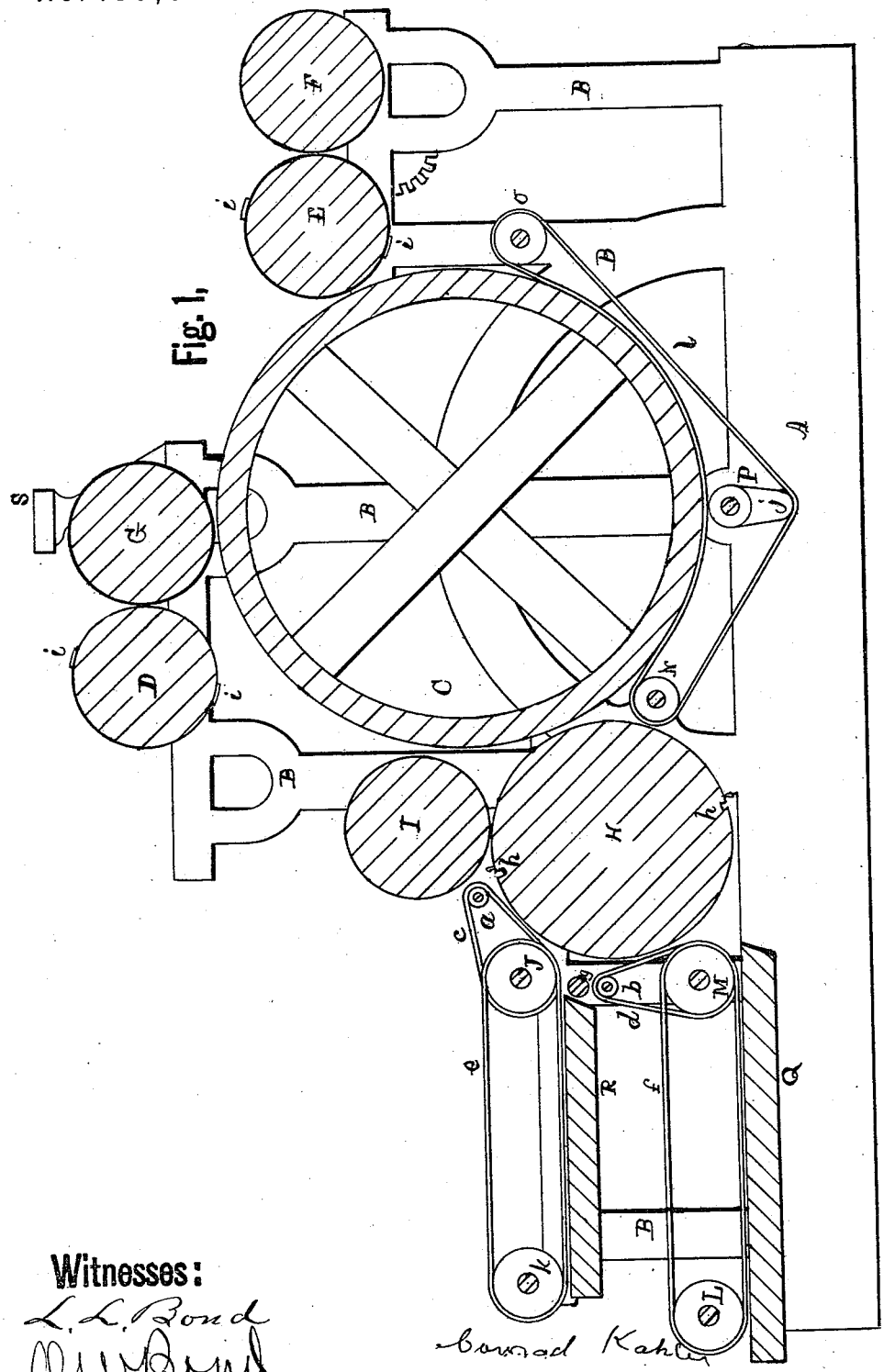
2 Sheets--Sheet 1.

C. KAHLER.

Rotary Printing-Press.

No. 165,838. Patented July 20, 1875.

Fig. 1.



Witnesses:

L. L. Bond

Conrad Kahler

Inventor.

2 Sheets--Sheet 2.

C. KAHLER.

Rotary Printing-Press.

No. 165,838. Patented July 20, 1875.

Fig. 2.

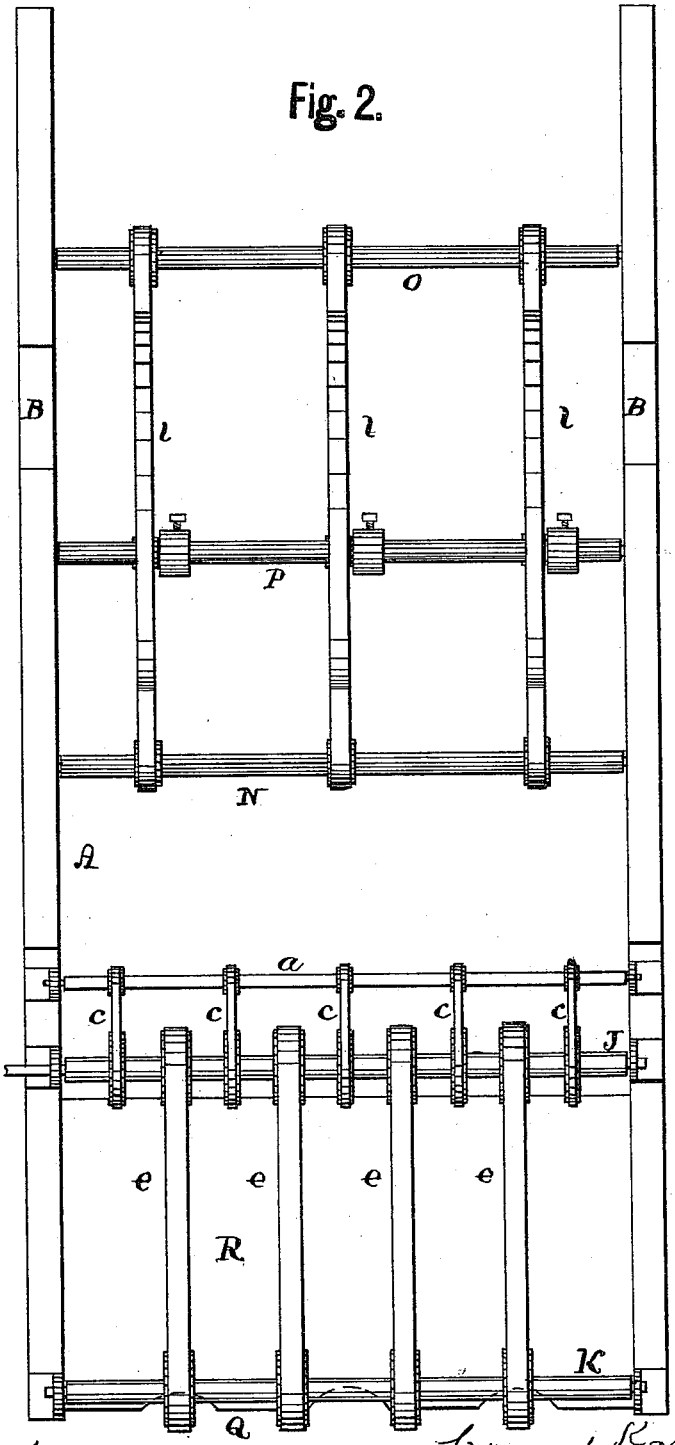


Fig. 5.

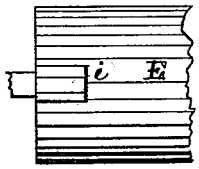


Fig. 4.

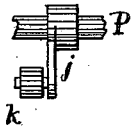
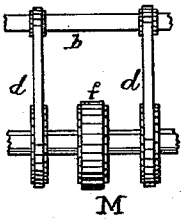


Fig. 3.



Witnesses:

L. L. Bond

C. W. Bond

Conrad Kahler

Inventor.

UNITED STATES PATENT OFFICE.

CONRAD KAHLER, OF CHICAGO, ILLINOIS, ASSIGNOR TO HIMSELF, MELVILLE C. EAMES, WILLIAM L. OGDEN, WILHELM SEVERIN, AND PHILIPP EMRATH, OF SAME PLACE.

IMPROVEMENT IN ROTARY PRINTING-PRESSES.

Specification forming part of Letters Patent No. **165,838**, dated July 20, 1875; application filed April 17, 1875.

To all whom it may concern:

Be it known that I, CONRAD KAHLER, of the city of Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Printing-Presses, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section; Fig. 2, a top or plan view of the tapes or belting below the main cylinder, and of the upper delivery tapes and belts; Fig. 3, a broken section, showing a part of the lower delivery belts or tapes; Fig. 4, a broken section, showing the regulator or tightener of the main cylinder-tapes; Fig. 5, a view of one end of a printing-cylinder.

The object of my invention is to improve the operation and efficiency of that class of printing-presses known as web-presses, or those which print in rolls; and its nature consists in providing the press with tapes or belts below the main cylinder, to prevent the paper from bagging or getting uneven in its movements; in providing two sets of tapes at the female cylinder, so as to deliver the sheets without the use of gripers, eccentrics, or cams; in providing the type-cylinders with steady-bearers or projections in the space or spaces left for margins, and in raising the fly or delivery boards, so as to dispense with the necessity of pits or openings in the floor for operating them, all as more fully hereinafter set forth and described.

In the drawings, A B represent the framework; C, the main cylinder, which also acts as the impression or blanket cylinder for type-cylinder E; D E, the printing or type cylinders; F, distributing-cylinder for the type-cylinder E; G, impression or blanket cylinder; H, the female cylinder, and I the male cylinder, having the usual serrated cutting-knife, (not shown;) J K L M, shafts provided with pulleys or wheels for operating the nipper-belts. J and M are also provided with additional pulleys or wheels for operating the delivery-tapes. N O, shafts provided with pulleys or wheels for operating the tapes beneath the main cylinder; P, shaft provided with arms for adjusting the pressure of the tapes against the main cylinder C; Q R, fly or delivery boards; S, smoothing-board; *a b*, shafts provided with pulleys or wheels for operating the upper or inner ends of the delivery-tapes; *c d*, delivery-tapes; *e f*, nipper-belts; *g*, cross bar or shaft; *h*, grooves for the cutting-knife in the female cylinder; *i*, steady-bearings on the printing-cylinders; *j*, arms on the shaft P; *k*, pulleys or friction-wheels on the arms *j*; *l*, main cylinder-tapes.

The inking rollers and apparatus are not shown, as my improvements do not relate to that part of the press; nor do I confine myself to the particular form or kind of press shown. Therefore, a particular description of such press will be unnecessary, further than to say that the main cylinder, printing and impression cylinders, and male and female cylinders are made and arranged in the usual form, except as hereinafter particularly mentioned. Below the main cylinder, or partly below and partly behind, I have arranged tapes *l*, on suitable shafts and pulleys, as shown in Figs. 1 and 2. These tapes bear against the main cylinder, and hold the paper up to its work, so that there is no bagging or slack to interfere with the movements of the paper, which renders it less liable to be torn, and less liable to interfere with the accuracy of the margins, and is of great use in starting the paper through the press, as it is carried around to the female cylinder by these tapes. They also prevent the paper from falling back or dropping out when the press is stopped at or just after the cut; and they also enable me to run the press with considerably less tension on the paper, which insures greater certainty in the action of the delivery-nippers, as with these tapes they are relieved from sustaining the weight of the paper, and are, therefore, less liable to tear out. When the paper is passed directly from the roll to the printing or impression cylinders it is carried in with a fullness which is liable to make it wrinkle in the press, which damages the printed sheet.

I obviate this difficulty by providing the press with a smoothing bar or board, S, at or near the point where the paper first enters the press, and, as the paper passes over this bar with a slight strain, the wrinkles are all taken out, and the paper spread to its full width upon entering the press, which I have found to be a very important advantage in operating this class of presses; for, when the paper is started in accurately and smoothly, it, with the aid of the tapes below the main cylinder, will remain smooth and uniform up to the point of its delivery from the press. This also aids in preventing the running of the margins.

In printing-cylinders for curved plates, as heretofore used, when the space left in the plate for the margin came in contact with the impression-cylinders, it produced a jar or shock, which was not only unpleasant, but injurious to the machinery. I overcome this by placing on the printing-cylinders small bearing-plates, *i*, which come up even with the face of the type, but so near the ends as not to take ink. These plates *i* are located so as to bridge the marginal spaces in the stereotype-plates, which leaves a smooth bearing-surface for continuous running between the printing and impression cylinders, without shock, jar, or noise; and by holding up the impression-cylinder in this manner, I prevent the blurring of the lines next to or adjacent to the margin.

I am aware that bearing-hoops, either as a whole or in sections, have been applied to type-cylinders; but they are for the purpose of regulating the impression, while my device in no way effects that, as the impression-cylinders bear against the type the same as before. They are permanently attached to the cylinders, and form guides for setting the plates, as well as bearings for conveying the impression-cylinders over the margins or breaks in the plates.

Heretofore, in discharging the sheets, or taking them off from the female cylinder, gripers, operated by eccentric grooves or cams, were used, which were exceedingly liable to get out of order, or be broken, when the press was run at a high speed. By my improvements I have been able to dispense entirely with the use of these gripers, pins, or hooks, which left the sheets with holes, or tore them, and deliver the sheets to the nippers by means of the tapes *c b*, as shown in Fig. 1, the upper and lower flies being separate and distinct in this press, as in others. The fly-belts *e* and *f* are made in the usual manner, and provided with the ordinary nippers. The inner shaft of the fly-belts *e* is provided with additional pulleys or wheels, as shown at Fig. 2, upon which the tapes *c* run; and the inner ends of these tapes are supported upon a small revolving shaft, *a*, having pulleys, and provided with suitable bearings, and located between the male and female cylinders, and as close to both cylinders as the cutter will permit. These tapes *c* hold the paper in position until the nippers on the belt *e* come in contact with its edge, when the sheet is drawn out and deposited upon the fly-board R. These nippers are arranged so that they take only each alternate sheet; the other sheet passes below, and is held in position by the tapes *d*, which pass over pulleys on the shafts M and *b*, which are arranged as shown in Figs. 1 and 3. The belts *d* hold the sheets, which pass the upper fly, until the nippers on the belt *f* take them, when they are drawn out and deposited upon the fly-board Q.

By this arrangement of belts and tapes I am enabled to dispense with much of the gearing, nippers, and shafting heretofore used for delivering sheets, and am thereby enabled to raise the fly-boards to a much higher relative position, which enables me to take hold of the paper before it has passed so far around the female cylinder as to make it difficult to catch the lower sheets. It also enables me to dispense with any pit or sink in the floor for operating the press, so that the press can be used, when desired, on any ordinary floor.

The arms *j* are separately attached to the shaft P, so that either one may be turned to adjust or regulate the tension of the tapes *l*, and make them uniform, without the trouble of making them of an exact length. When adjusted the arms *j* are held in place by the set-screws shown in Fig. 2. The shaft *g* may be used to carry the tail end of the sheet for the upper fly, or it may be omitted altogether, and the shaft *b* put in its place, so as to catch the lower sheets higher up, which will be an advantage in fast delivery.

By elevating the fly-boards I obtain greater facility in the discharge of the sheets, and without the elevation of the bottom one it would be impracticable to dispense with the gripers, as the sheets pass so far under the female cylinder when the fly-board is left in its old position.

By these improvements I get a continuous rotary movement in all of the parts and a free delivery of the sheets, so that I can increase the speed of the press nearly or quite one-half.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. The combination of the tapes *l*, supported upon the shafts N, O, and P, with the main cylinder C and the cutting-cylinders H I, for holding the paper against the main cylinder, giving uniform margins, and steadily delivering it to the discharge apparatus, substantially as specified.

2. The tapes *c*, in combination with the nipper-belts *e* and the cylinder H, substantially as and for the purpose described.

3. The combination of the tapes *d* with the nipper-belts *f*, cylinder H, and fly-board Q in a double-delivery press, elevated for taking the lower paper from the cylinder at the quarter turn from the cutter, substantially as set forth.

4. The combination of the tapes *c d* and nip-

per-belts *e f* with the cylinders H I, substantially as and for the purpose specified.

5. The steady-bearers *i* on the type-cylinder, between the curved stereotype-plates, to prevent the impression-cylinder from pressing into the spaces between the plates and spaces left for margins, and for preventing blurred printing, and giving a steady and uniform motion between the type-cylinder and impression-roller, substantially as specified.

CONRAD KAHLER.

Witnesses:
L. L. BOND,
O. W. BOND.