4 Sheets—Sheet 1.

J. O. KURTZMANN.

Printing-Presses.

No. 196,025. Patented Oct. 9, 1877.

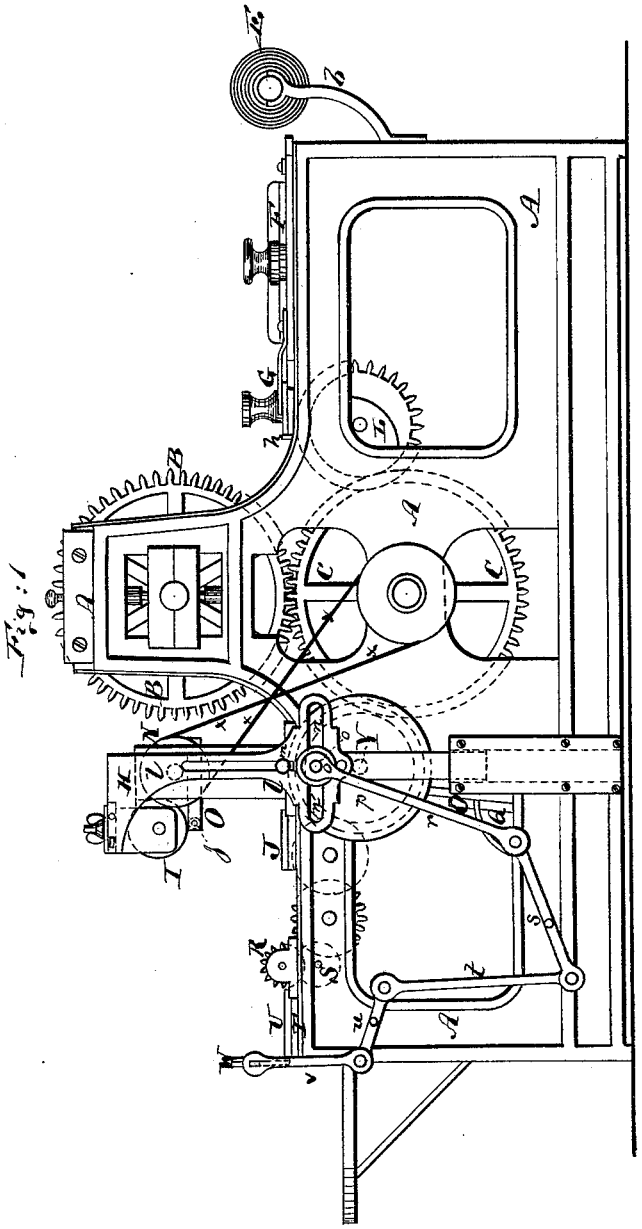

Fig. 1.

Witnesses
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by his attorney
A. V. Briesen

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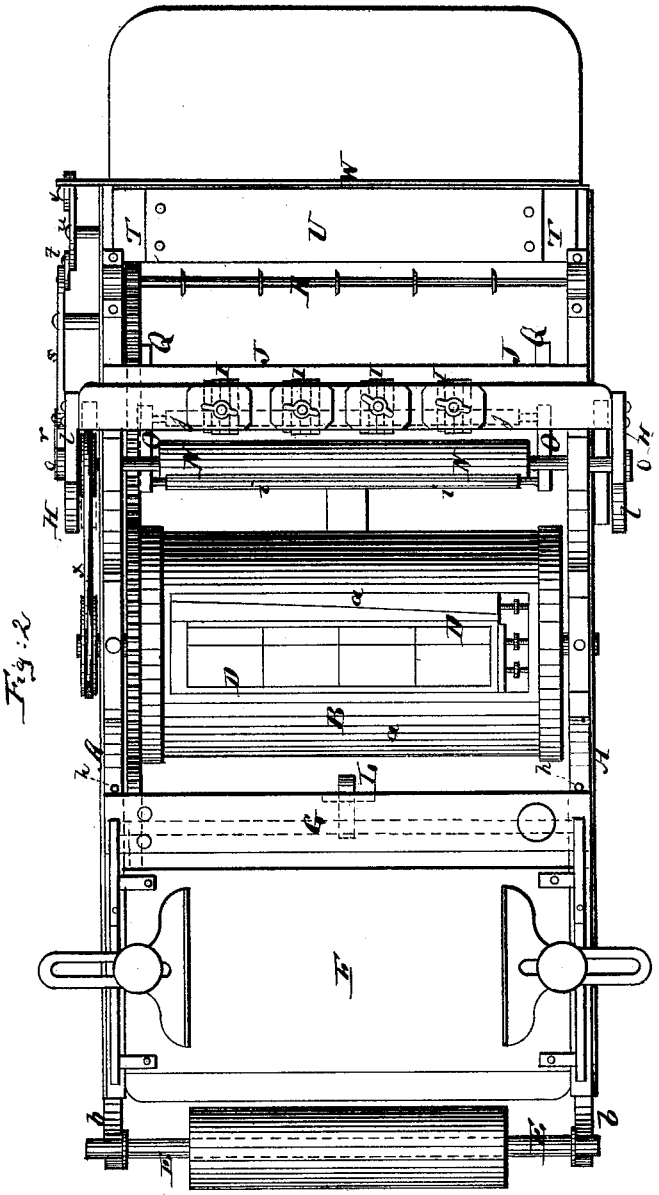

Fig. 2.

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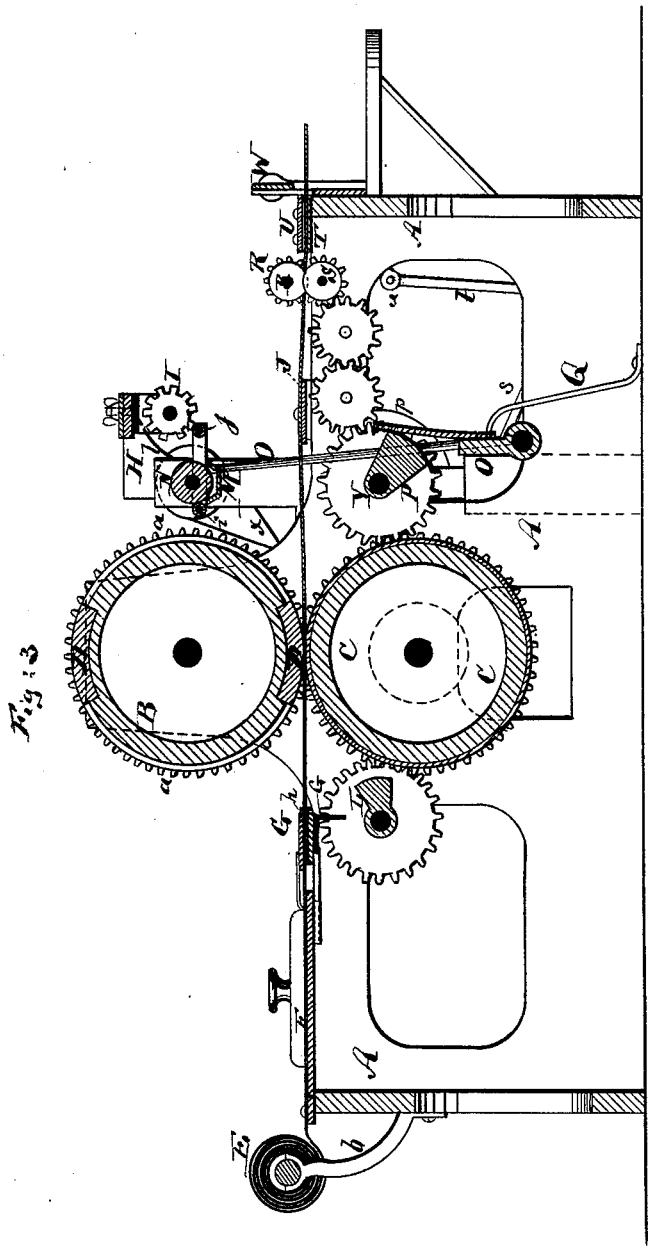

Fig. 3.

Witnesses

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Printing-Presses.

No. 196,025. Patented Oct. 9, 1877.

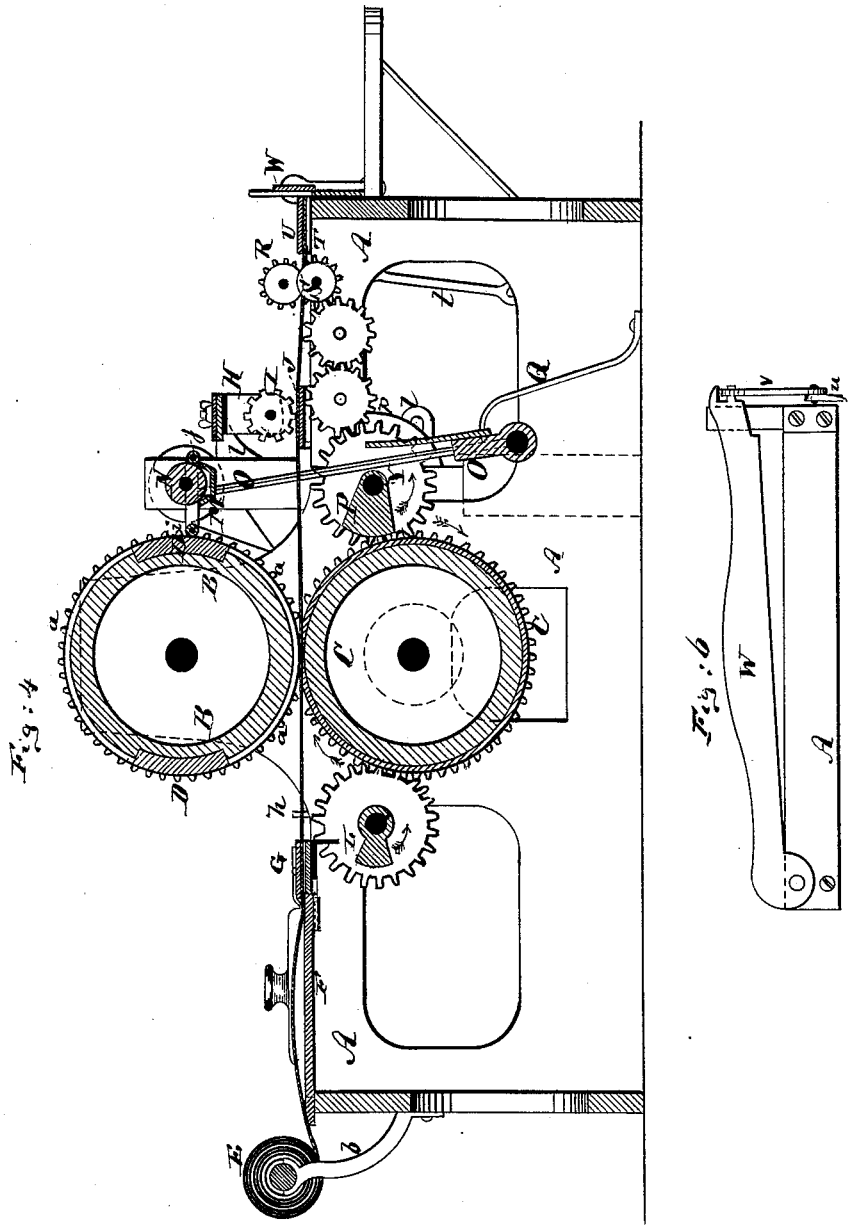

Fig. 4

Fig. 6

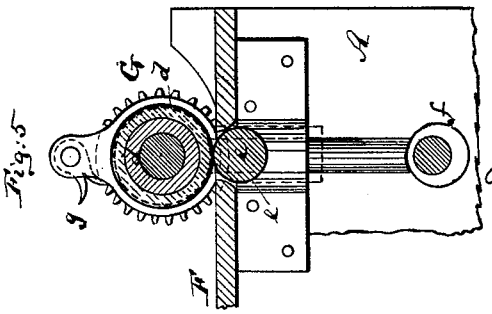

Fig. 5

Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN O. KURTZMANN, OF NEW YORK, N. Y.

IMPROVEMENT IN PRINTING-PRESSES.

Specification forming part of Letters Patent No. **196,025**, dated October 9, 1877; application filed January 27, 1877.

To all whom it may concern:

Be it known that I, JOHN O. KURTZMANN, of New York city, in the county and State of New York, have invented a new and Improved Printing-Press, of which the following is a specification:

Figure 1 is a side elevation; Fig. 2, a plan or top view; Fig. 3, a vertical longitudinal section of my improved printing-press. Fig. 4 is also a vertical longitudinal section of the same, showing the parts in a position different from what they are in Fig. 3; Fig. 5, a vertical sectional view of a modification of the back-feed; and Fig. 6, a detail face view of the lateral knife employed on the machine.

Similar letters of reference indicate corresponding parts in all the figures.

This invention relates to a new cylinder-press which is more particularly intended for the printing of what are known as "coupon-tickets," used on railroads and for analogous purposes; but the invention is also applicable to the rapid printing of other suitable matter, and not confined in its use to any particular purpose.

The difficulty to be overcome in constructing a suitable cylinder-press for printing tickets, for example, especially such tickets or devices as require to be consecutively numbered, is, first, the arrangement of a suitable inking apparatus, whereby I could be enabled on the same cylinder-press to print and also consecutively number the several tickets.

One feature of my invention therefore consists in combining with the printing-cylinder, which contains the necessary type for printing with suitable rapidity, a numbering apparatus adapted for consecutively numbering the pieces printed on the press after the general reading-matter shall have been printed thereon; and in combining with such a type-cylinder and numbering mechanism an inking apparatus adapted to automatically apply printing-ink to said cylinder and to said numbering apparatus from the same fount, and, in fact, by the same means.

Another difficulty to be overcome was the adjustment of the paper after its passage beneath the type-cylinder, on which cylinder blank spaces are left between the two or more series of type-frames. I found that the type, in feeding the paper, leaves too much blank space between the tickets on the paper, and not enough blank space for many other purposes.

To overcome this difficulty, I have combined with the press a means for drawing the paper back or forward after the printing-cylinder has printed one ticket or portion of paper, and while the blank portion of the cylinder is in line with the paper. By this means I am enabled to print the tickets closely together or far apart, if desired, by a continuously-revolving cylinder, and yet to number these tickets, and also to cut them by means of rotary shears, and finally by a transverse knife.

My invention also consists in various other details of construction of parts, as hereinafter more fully described.

In the accompanying drawing, the letter A represents the frame of the press. The same is made of cast-iron or other metal or material, of such form, size, and strength as to enable it to support the parts of the mechanism in proper relation to one another, and to afford due security. B is the printing or type cylinder, hung transversely in the frame, and operated by means of gear-wheels, belts, or other suitable devices. C is the pressure-cylinder, placed beneath the type-cylinder B, and parallel thereto, as clearly shown in Figs. 3 and 4. Between these two cylinders B and C the paper is printed, the cylinder B containing the necessary type in frames D, so adjusted with reference to the circumference of the cylinder B that there shall be blank spaces *a a* between the printing parts or frames holding the type. In other words, the two, three, or more frames D, holding the type, are placed at equal distances from each other around the circumference of the cylinder, with receding parts *a a* between them, which receding parts, if above the cylinder C, as in Fig. 4, will leave the paper between the two cylinders free to be drawn back or forward, as the case may be. Each frame D may contain one set of types or a larger number, transversely arranged. Thus, in Fig. 2, the frame is represented to contain four separate sets of type for printing four tickets simultaneously on the same strip of paper, which four tickets are afterward separated from each other by the cutting mechanism hereinafter more fully described. E is the roller containing the paper to be printed. This roller is hung at one end, which I term

the "back end" of the machine, in suitable brackets *b*, and has wound upon it a quantity of the paper which is to be converted into tickets or other printed matter by the machine; but, instead of using a coil of paper, other suitable form thereof may be used and suitable feed mechanism supplied.

As shown in the drawing, the machine is arranged to feed the paper solely by the portions D of the cylinder B, which draw the paper along while printing it. The paper from the coil E passes over a table, F, through the drawback mechanism G, and thence between the cylinders B C, that print it. In front of the printing-cylinders B C is hung, in a suitable vertically-movable frame, H, the numbering mechanism, there being a series of numbering disks or devices, I, for each separate block of type—that is to say, for each ticket to be printed in a frame, D. The tickets, after the paper has passed between the printing-cylinders, are numbered consecutively by the numbering-disks I, the same being, by the vertically-descending frame H, brought into contact with the paper, a table, J, being placed beneath the paper, directly under the numbering mechanism, to receive the pressure. The numbering-disks are actuated by suitable mechanism (not shown, nor a part of my invention) that is to say, they are adjusted to apply the consecutive numbers in the manner well known in numbering devices.

Now, as already stated, I have found that the type on the cylinder B, in feeding the paper, would leave too great a blank space between the coupon-tickets, while for many other species of work these blank spaces are not large enough. The drawback mechanism G is placed behind the cylinders B C for the purpose of overcoming this objection, and it serves to draw the paper which has been printed back a required distance sufficient to reduce the blank space between the tickets that are printed.

The drawback mechanism G may either be constructed, as in Fig. 4, of two plates, which are caused, by springs or otherwise, to clamp the paper as it passes from the roll E between the said plates, said plates at the proper time—while the printing-cylinder B is in the position shown in Fig. 4—being moved backward by a cam, L, which strikes a pendent lip on the drawback. The drawback mechanism may, however, be constructed of other forms, such, for instance, as shown in Fig. 5, which shows it to consist of two rolls, *d e*, of which the upper roller, *d*, is vertically adjustable by means of a cam, *f*, which is mounted upon the driving-shaft. The roller *d* is hung in standards, that rest upon the cam *f*, as indicated. In case I use the rollers *d e*, I supply the upper roller *d* with a toothed wheel and double—that is, reversible—pawl *g*, so that when the paper passes between these rollers while they are brought together the ratchet mechanism may be set in play to cause the requisite paper to be properly drawn back. If this drawback, or this device which I term the "drawback," is to be used for enlarging, instead of reducing, the blank spaces between the printed tickets or sections, it is only necessary to reverse the pawl *g* on the upper roller, in which case the device will constitute an additional feed, to increase the forward motion of the paper at the moment during which the part *a* of the cylinder B is above the paper.

The drawback mechanism G, composed of the two plates, as shown in Fig. 4, said two plates continuously grasping the paper, is of such nature that when the clamp does not draw back the paper, and while the cylinder B prints and feeds the paper, the forward motion of the paper will carry said drawback against a suitable fixed stop, *h*, and will, after the drawback has reached said fixed stop, cause the paper to be pulled through it without further changing the position of the drawback; yet, when subsequently the cam L affects the drawback, pushing it back, the said drawback will carry the paper back with it.

Between the numbering mechanism H I and the type-cylinder B is secured, in a standard or standards of the frame A, a transverse ink-fount, M, which supplies a continually or intermittingly rotating cylinder, N, with printing-ink. From this cylinder I supply two rollers, *i j*, with ink, the roller *i* transferring it to the type-cylinder B when the same is in the position shown in Fig. 4, and the roller *j* transferring it to the numbering-disks I when the same are in the position shown in Fig. 3—that is to say, in their elevated position. To effect this, I hang the rollers *i j* in a vibrating frame, O, which is actuated by a cam, P, and by a spring, Q. The spring Q crowds the frame O toward the printing-cylinder B, causing the roller *i* to supply the types in the frames D in the manner shown in Fig. 4, at the same time holding the roller *j* against the inking-roller N, and supplying *j* with ink. After the type-cylinder has thus been supplied the cam P vibrates the frame O in the opposite direction, as indicated in Fig. 3, causing the roller *i* to bear against the roller N and become charged with ink, and holding, at the same time, the roller *j* against the elevated numbering-disks, and supplying those portions of the same which are next to reach the paper with ink. In this manner I am enabled to use the same inking-fount and the same frame O for supplying the cylinder and the type mechanism with the requisite quantity of printing-ink. After the paper has been printed and numbered in the manner stated it is passed between two shafts, R and S, which are supplied with a series of circular knives or shears, that cut said paper into as many strips as there are separate type sections or frames in each frame D. Thus, where there are four tickets printed by said frame D, as indicated in Fig. 2, and where there are four separate numbering devices used in conjunction therewith, as also indicated in Fig. 2, I prefer to use five series of cutting-shears, three of them for separating the four strips from one another, and the two outer

ones for trimming the paper of the outer rows of tickets. Directly behind these cutting-shears R S the paper passes over a table, T, and beneath a guide-plate, U, until it arrives under a knife, W, which is laterally placed onto the frame A, as indicated in Fig. 6, and which, after one length of tickets or printed matter has been passed beneath it, is brought down by the mechanism hereinafter specified, to cut such length off the continuous length of paper. These tickets then fall upon a table, from which they may be removed in suitable manner.

The frame H, which carries the numbering-disks I, is provided with slotted standards *l l* at its ends, (see Fig. 1,) which standards are guided by pins *m* that pass through the vertical slots, and which standards are also supplied with horizontal slots *n*, for receiving crank-pins *o* that project from a disk, cam, or eccentric, *p*, of an actuating-shaft, Y, so that by rotating said shaft Y the crank-pins *o* will be caused to draw the standards *l*, and with them the frame H, up and down in the desired manner, the crank-pins *o* meanwhile playing in the horizontal slot *n* of the uprights *l*. In order to cause the reciprocating motion of the numbering devices to coincide with the action of the knife W, I connect one of the cranks *o* by a series of levers, *s* and *u*, and links *r t v*, as in Fig. 1, with the said knife W, so that the knife will be caused to descend at the same time that the numbering-wheels descend, and to rise at the same time that they are elevated. As to the means employed for rotating the shafts R S actuating the cams P L and the printing-rollers, and also the inking-cylinder N, they may be of suitable kind, and I have not deemed it necessary to illustrate them otherwise than by a belt, *x*, which is shown in Fig. 1 to extend from the shaft of the cylinder C to the roller N. These means may be varied at pleasure, and do not constitute part of my present invention.

I claim as my invention—

1. The combination of the form-rollers *i j*, which straddle the distributing-roller N, with the vibrating frame O, cam P, and spring Q, and with the printing-cylinder B and numbering-disks I, to operate substantially as herein shown and described.

2. In a printing-press, the combination of the printing-cylinders B C with the drawback mechanism G, substantially as and for the purpose specified.

3. The combination of the rollers *d e* and reversible ratchet mechanism *g* with the printing-cylinders B C, for varying the feed of the paper after the same has been printed on the press, substantially as specified.

4. The combination of the draw-back mechanism G with the printing-cylinders B C and numbering-disks I, all arranged so that the drawback mechanism acts when said cylinders and disks do not print, substantially as specified.

JOHN O. KURTZMANN.

Witnesses:

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W. H. WOODCOCK.