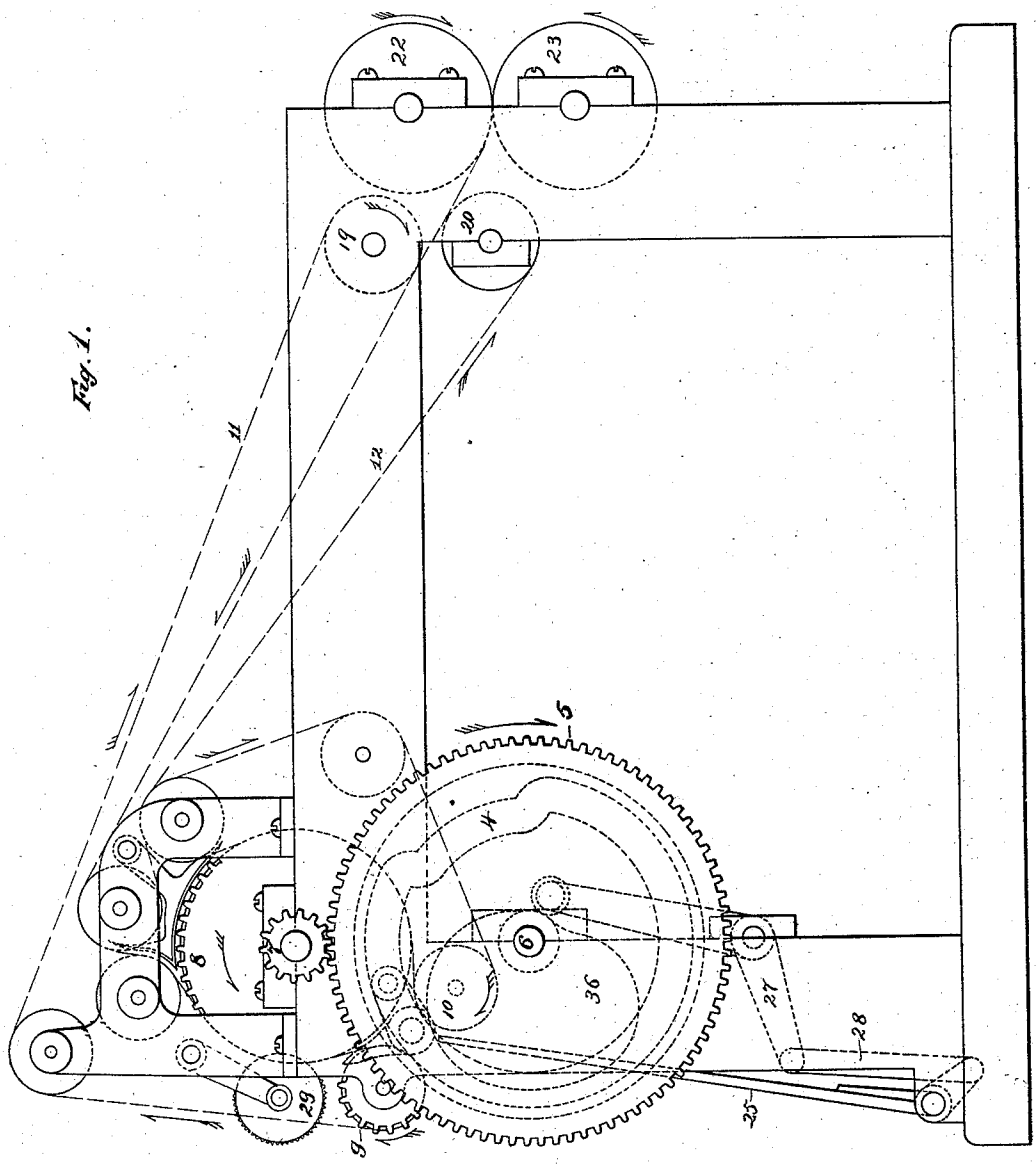
4 Sheets—Sheet 1.

S. D. TUCKER.

DELIVERY APPARATUS FOR PRINTING-MACHINES.

No. 193,056. Patented July 10, 1877.

Fig. 1.



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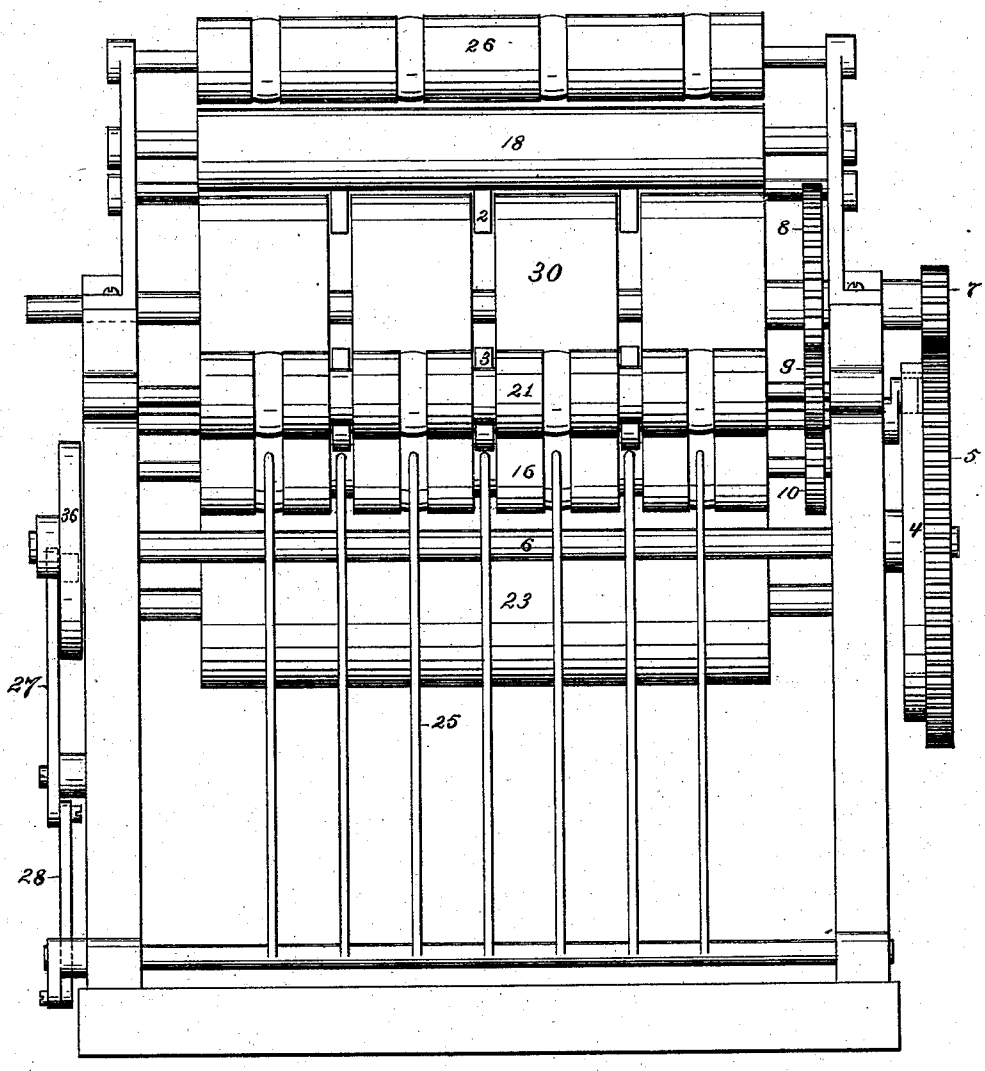
4 Sheets—Sheet 2.

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Fig. 2.



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4 Sheets—Sheet 3.

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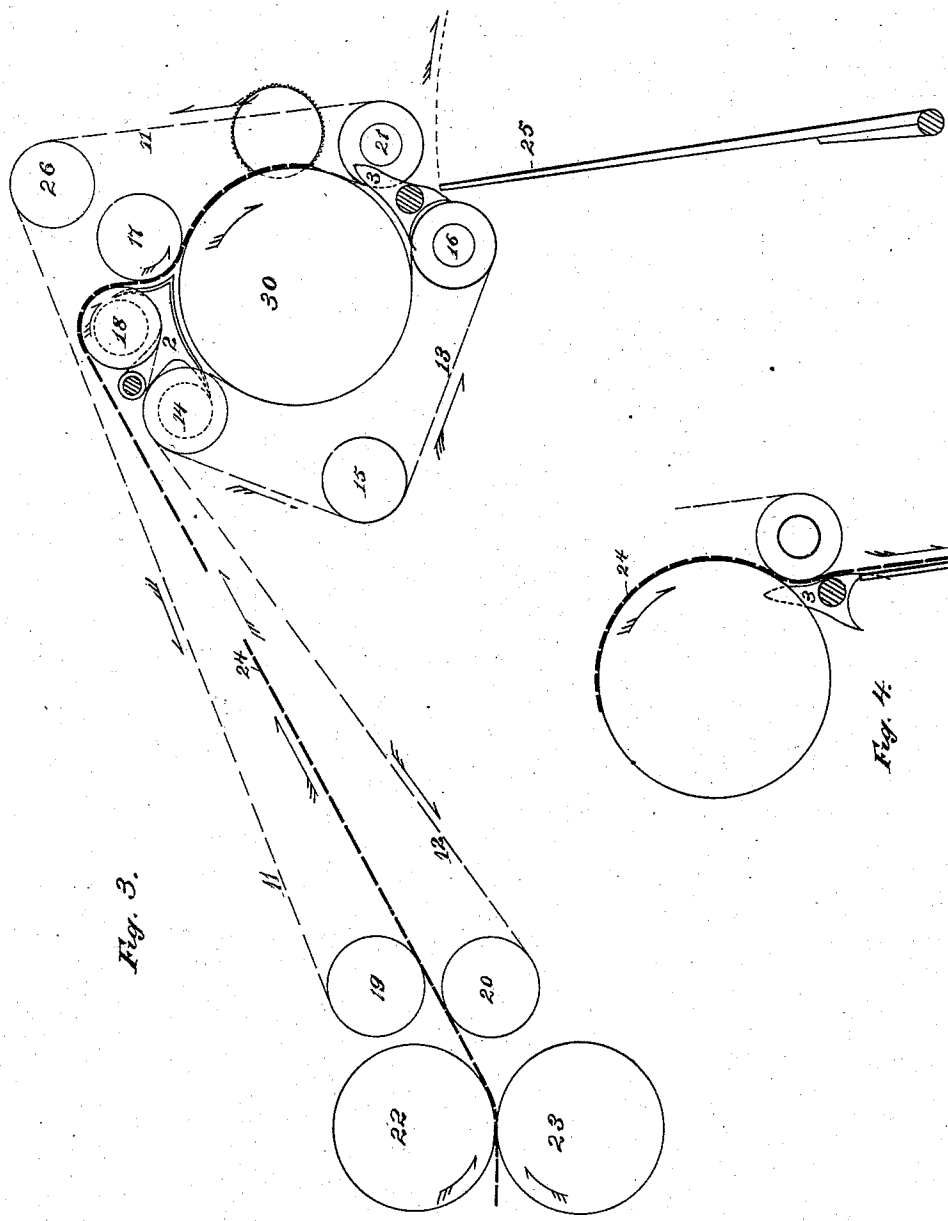


Fig. 3.

Fig. 4.

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4 Sheets—Sheet 4.

S. D. TUCKER.

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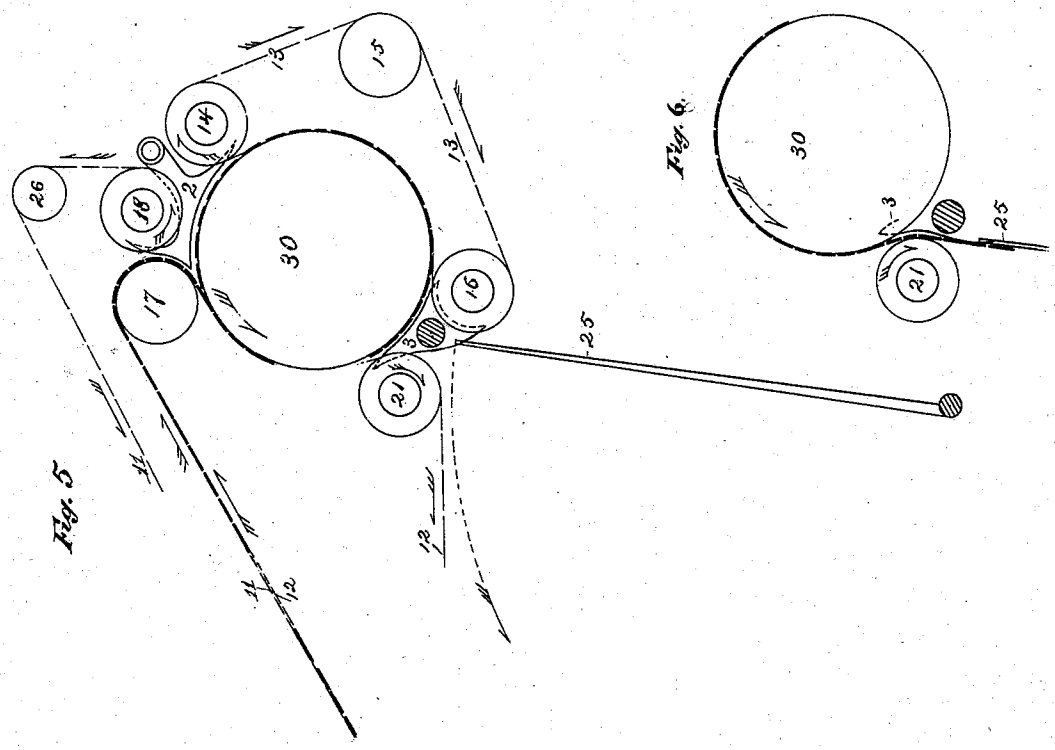


Fig. 5

Fig. 6.

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UNITED STATES PATENT OFFICE.

STEPHEN D. TUCKER, OF NEW YORK, N. Y.

IMPROVEMENT IN DELIVERY APPARATUS FOR PRINTING-MACHINES.

Specification forming part of Letters Patent No. **193,056**, dated July 10, 1877; application filed February 23, 1877.

To all whom it may concern:

Be it known that I, STEPHEN D. TUCKER, of the city, county, and State of New York, have invented an Improvement in Delivering Apparatus for Printing-Presses, of which the following is a specification:

This invention is an improvement upon the delivery mechanism for printing-presses which is embraced in Letters Patent No. 192,510, granted June 26, 1877, to Richard M. Hoe and Stephen D. Tucker, and which mechanism consists chiefly in a revolving carrier upon which two or more sheets are successively accumulated, and from which they are simultaneously flown or discharged.

The present improvement consists in a peculiar arrangement of tapes by which the web, partially severed by the cutting-cylinders, is torn into sheets, which are delivered to and maintained upon the collecting-cylinder, by which arrangement the said sheets may be received upon the cylinder at one point and delivered therefrom at another, all of which will more fully hereinafter appear.

In the said invention of Richard M. Hoe and myself the web is severed completely by the cutting-cylinders, and the sheets pass directly onto the collecting or accumulating revolving carrier.

It has been found desirable in running these mechanisms at high speed to so construct the cutting-cylinders that the web shall only be partially severed at the line separating sheet from sheet, and to supply tapes to conduct the web from the cutting-cylinders to the collecting-cylinder, which tapes shall run at a higher surface speed than the cutting-cylinders, and thus tear sheet from sheet and conduct the same onto the collecting-cylinder.

The collecting-cylinder has also been made of a circumference about five inches greater than the length of the sheet, for the purpose of providing a space between the front and rear ends of the accumulated sheets, into which spaces the switches or deflectors may be moved to guide the mass off from the collecting-cylinder, which enlarged collecting-cylinder also serves to drive the supply-tapes at the increased speed referred to. These features are, however, not claimed herein, since they form a part of the subject-matter of another application.

In machines embodying the constructions last hereinbefore described, it is desirable, in order to receive the sheets at one point upon the cylinder and deliver the same from another point considerably distant from the point of reception, to provide three sets of tapes, (see Figs. 3,) viz., two sets, 11 12, for carrying the sheets from the cutting-cylinders to the collecting-cylinder, one set, 11, of which extends around the cylinder to the point where the sheets are to be delivered from off the cylinder, and a third set, 13, running over rollers 14 15 16, covering that portion of the cylinder between the point of reception to the point of delivery of the sheets. The cylinder, as is readily understood, must be encompassed by tapes in order to sustain the sheets upon it; and since these tapes must travel in the same direction in which the cylinder revolves, it is obvious that the tapes 12 cannot be extended over the space covered by the tapes 13, since they necessarily travel in an opposite direction.

The portions of the cylinders not covered by the endless tapes, namely, the sheet entrance and exit points, are guarded by the guides or deflectors 2 and switches or deflectors 3, which are curved metal plates held in place so that their surfaces coincide with the periphery of the collecting-cylinder.

They thus bridge the space between the tapes, and guide the sheets around the cylinder. The shape of those marked 2 is such that their front surfaces coincide with the surface of the tape-rollers 17, whereby they assist in guiding the sheet from the tapes 11 onto the cylinder. Those marked 3 are hung on a rock-shaft, and have a mode of operation hereinafter described.

In the arrangement herein shown in Fig. 3, the sheets are only partially severed from the web of paper by the cutting-cylinders 22 23, the portion left uncut at several points in the width of the sheet being sufficient to support and guide the paper 24 between the two series of endless supply-tapes 11 12 that conduct the sheet to the grooved collecting-cylinder 30. This cylinder is caused to revolve turn

for turn with the cutting-cylinders by means of bevel-gear connecting its shaft with that of one of the cutting-cylinders 22 23, it being understood that said cutting-cylinders are geared together.

The diameter of the collecting-cylinder is about one and a half inch greater than the cutting-cylinders, which will cause the tapes 11 12 to travel somewhat faster than the paper, and, as the front edge of the partially-cut sheet arrives at the grooved roller 18, it is caught by the nip of the tapes 11 12 around the curve of said roller, and carried forward at an increased speed, and torn loose from the web. At this time the front edge of the second sheet has entered a sufficient distance between the tapes 11 12 for them to support and carry it forward. In the meantime the first sheet is carried on under the roller 17 to the grooved collecting-cylinder 30, the lower set of tapes 12 returning around the roller 18 to the receiving-roller 20; but the upper tapes 11 pass round the cylinder 30 to the roller 21, and return by the roller 26 to the receiving-roller 19. The sheet is thus conducted by the tapes and fixed guide or deflector onto the collecting-cylinder 30, and will be carried round with it and past the tape-roller 21 and the movable deflector or switch 3, between the short tapes 13 and the periphery of the cylinder 30, and under the fixed guide 2. At this point the collecting-cylinder 30 will meet and receive the front edge of the second sheet, which is deposited directly upon the first. The cylinder 30 will thus receive in a similar manner a third and fourth sheet, until the sixth sheet is deposited upon it. As the collecting-cylinder 30 is, in diameter, one and a half inches larger than the cutting-cylinders, its circumference is nearly five inches greater than the length of the sheets that are on it, and this space of five inches is sufficient to allow the points of the deflectors or switches 3 to be moved into the grooves of the cylinder 30 behind the six sheets, and guide them off from the cylinder down in front of the fly-frame 25, which will at that time be in position to receive them.

The deflector or switches 3 are operated by a grooved cam, 4, formed on the inner side of a spur-wheel, 5, keyed on the shaft 6. This wheel receives its motion from the pinion 7 on one end of the shaft of the cylinder. The pinion is to the wheel in the proportion of one to six, so that at every sixth revolution of the collecting-cylinder 30, the cylinder having received six sheets, the cam 4 moves the points of the switches in behind the six sheets, and thus guides them off to the sheet-flyer, as is seen in Fig. 4.

The deflectors or switches 3 return back to their original position in time to guide the next sheet on around the cylinder as before, as in Fig. 3.

On the opposite end of the shaft 6 is keyed the cam 36 that operates the fly-frame by means of the bell-crank lever 27 and connecting-rod 28, in the usual manner.

In order to surely drive the endless tapes 11 12 13, a toothed wheel, 8, is fixed upon the shaft of the collecting-cylinder 30, and gears into a pinion, 9, on roller 21, and into another, 10, on the roller 16. This gearing, together with the contact of the tapes with the collecting-cylinder, insures their regular and perfect action in conveying the sheets.

It will be seen that the number of sheets received on the collecting-cylinder at one time and then operated on by the sheet-flying mechanism may be increased or diminished by simply increasing or diminishing the proportion to each other of the pinion 7 and wheel 5 of the spur driving-gear.

When the paper operated upon is of double width, and it is necessary to divide it before passing it to the fliers, a circular saw, 29, is caused to revolve in a groove of the collecting-cylinder.

This arrangement of the mechanism is preferably employed when there is no obstacle to the height and length of the press necessitated by having the fly receive the sheets from the front side and lower surface of the cylinder.

When, however, it is desired to reduce the length of the press, the collecting-cylinder is made to revolve in the opposite direction, and the fly is made to operate so as to deliver the sheets in toward the printing-machine. The tape are thus disposed, as is seen in Fig. 5.

The tapes 12, which run in the right direction, are made to encompass about one-third of the circumference of the cylinder, while the tapes 11 are simply passed around pulleys 18 at one point of the circumference of the cylinder, and the tapes 13 encompass, as formerly, that portion of the cylinder between the points of the entrance and delivery of the sheets.

The two positions of the switch or deflector 3 are shown in Figs. 5 and 6.

The tape-rollers 16 21 are grooved (see Figs. 2, 3, 5, and 6) to admit the ends of the switches 3 into them as the switches are rocked to retain the sheets on the collecting-cylinder, or direct them off the same.

In like manner the tape-rollers 14 18 are grooved to receive the end of the fixed guides or deflector.

The collecting-cylinder is likewise grooved, (see Fig. 2,) to admit the toes of the switches or deflector.

It is obvious that the collecting-cylinder may be an endless carrier of any other construction, such as tapes passed around two or more carrying-cylinders.

What is claimed is—

1. The combination of the collecting-cylinder 30 and endless tapes 11, 12, and 13, substantially as described.

2. The combination of the collecting-cylinder 30, endless tapes 11 12 13, and deflectors or switches 3, substantially as described.

3. The combination of the collecting-cylinder 30, endless tapes 11 12 13, guides or deflectors 2, and deflectors or switches 3, substantially as described.

4. The combination of the collecting-cylinder 30, endless tapes 11 12 13, deflectors or switches 3, and fly 25, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

STEPHEN D. TUCKER.

Witnesses:
M. B. PHILIPP,
H. T. MUNSON.