

No. 667,604.

F. C. STOCKHOLM.

Patented Feb. 5, 1901.

SHEET DELIVERING AND CONVEYING MECHANISM FOR PRINTING PRESSES.

(Application filed Aug. 29, 1899.)

(No Model.)

2 Sheets—Sheet 1.

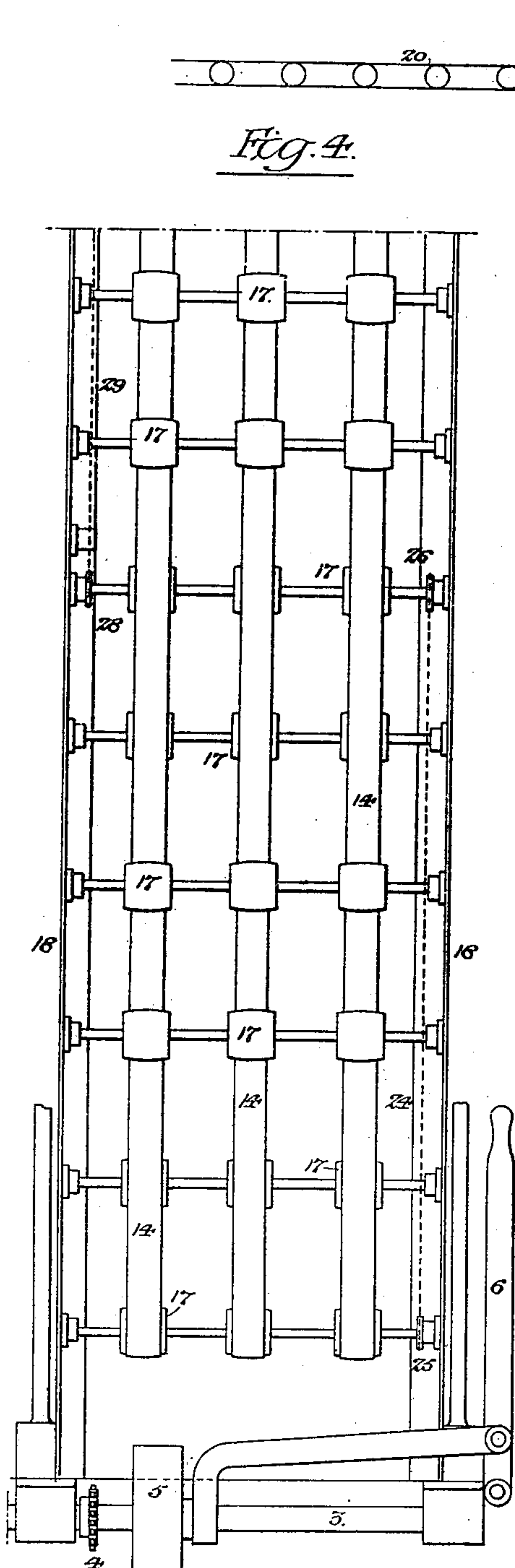


Fig. 4.

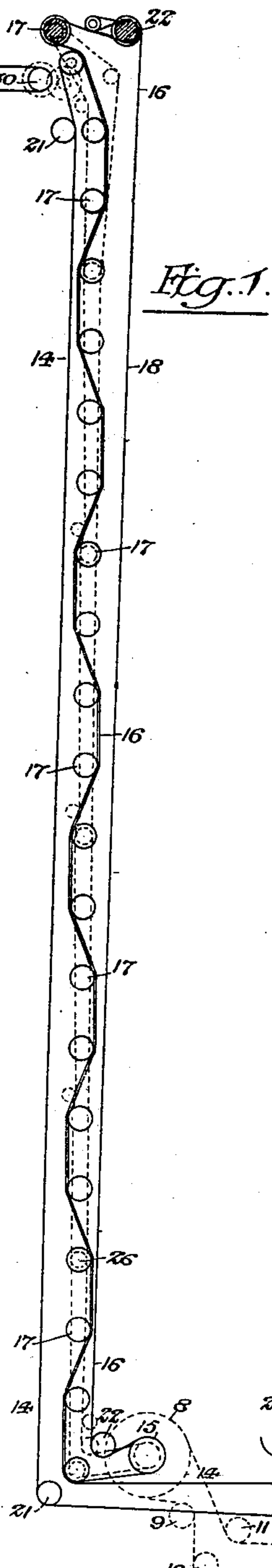


Fig. 1.

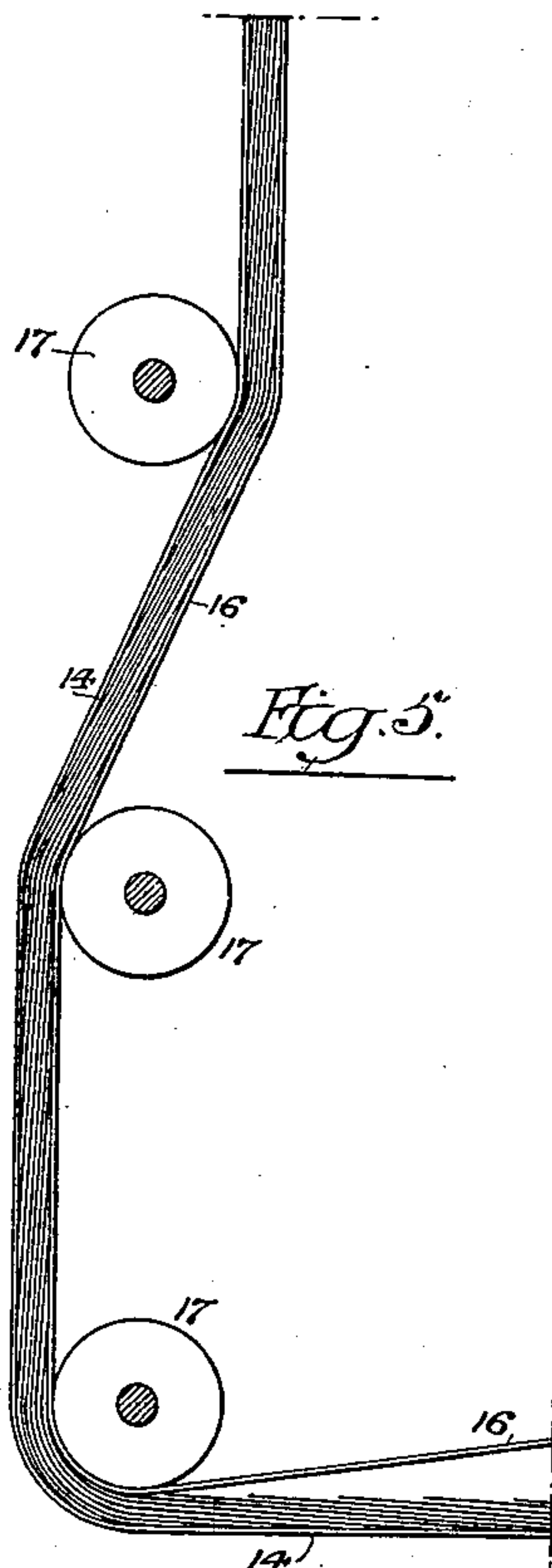


Fig. 3.

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2 Sheets—Sheet 2.

Fig. 2.

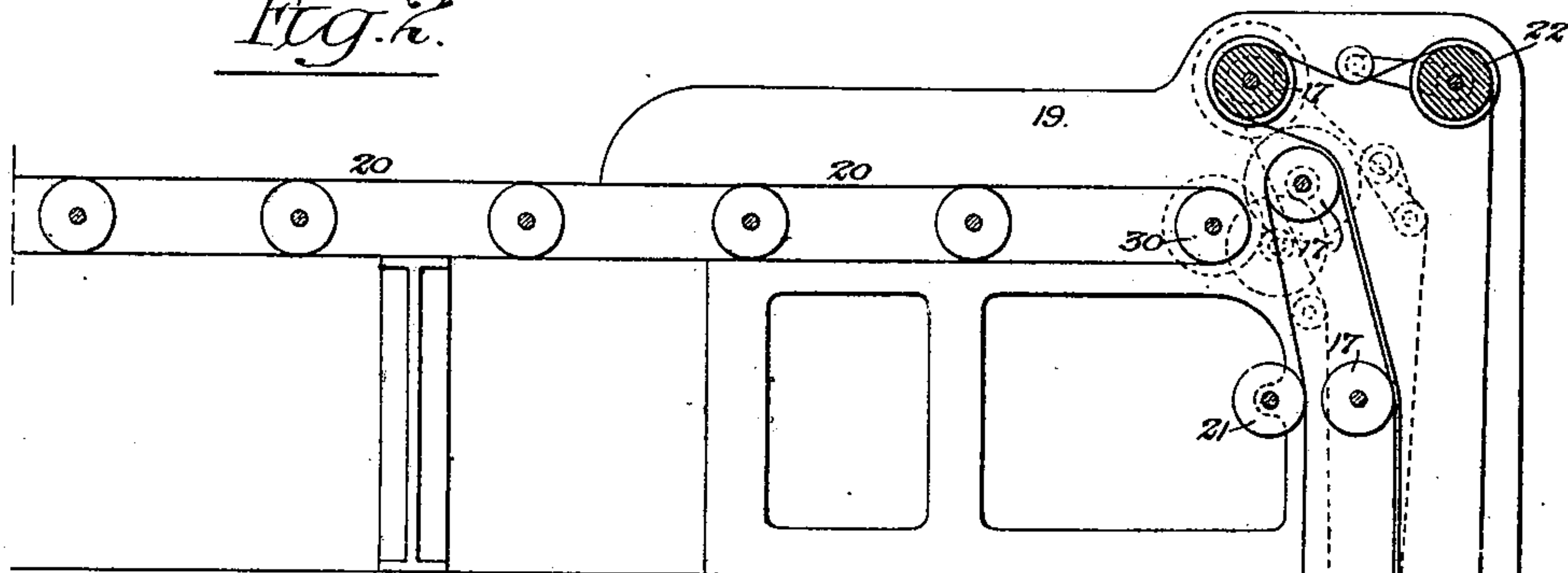


Fig. 6.

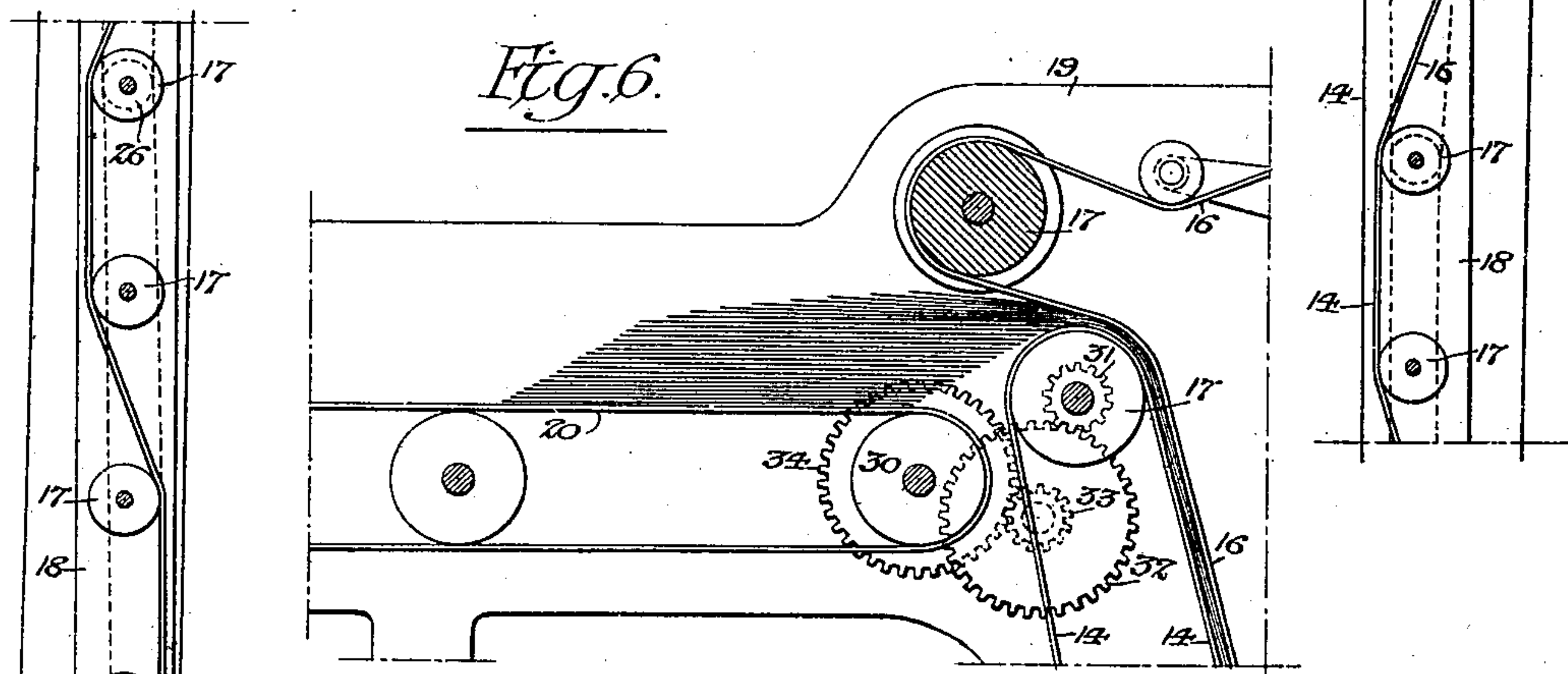
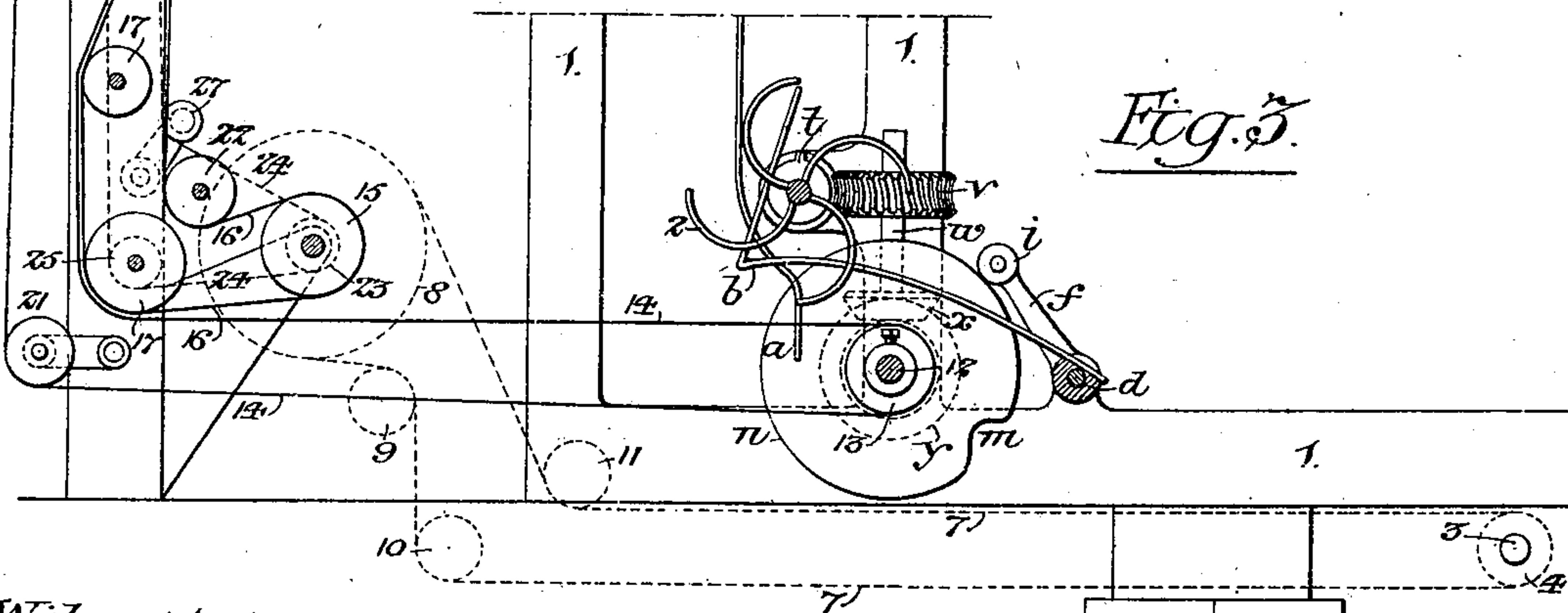


Fig. 3.



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UNITED STATES PATENT OFFICE.

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SHEET DELIVERING AND CONVEYING MECHANISM FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 687,604, dated February 5, 1901.

Application filed August 29, 1899. Serial No. 728,870. (No model.)

To all whom it may concern:

Be it known that I, FRANK C. STOCKHOLM, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain
5 Improvements in Sheet Delivering and Conveying Mechanism for Printing-Presses, of which the following is a specification.

The object of my invention is to provide
10 a mechanism for conveying printed sheets from a high-speed press and delivering them in a pile at a point remote from the press and, if desired, at a point above the latter—for instance, on a floor above that on which the press is located. This object I attain in the
15 manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a diagrammatic view illustrating my invention. Figs. 2 and 3 are views illustrating parts of the apparatus more in
20 detail and on a larger scale. Fig. 4 is a front view of part of the conveyer, and Figs. 5 and 6 are views illustrating the operation of different parts of the device.

In the operation of high-speed presses, such
25 as those employed for printing newspapers, the printed sheets are deposited with very slight overlap on the short delivery-belt, and much labor is required in removing the rapidly-accumulating sheets from this belt and
30 carrying them to the mailing and delivery room or other point remote from the press and usually upon a floor above that on which the press is located, several men being required in connection with each press for the
35 performance of this duty, even though platform-elevators are employed for lifting the printed sheets from one floor to another. The object of my invention is to dispense with this labor and to convey the sheets as
40 fast as they are delivered by the press to the mailing or delivery room or other point remote from the press, at which point they are so piled as to be readily handled in bulk.

The apparatus comprises, essentially, a double-belt high-speed conveyer, usually an elevating-conveyor, one belt forming the delivery-belt of the press and receiving the printed sheets therefrom, the speed of this conveyer being so high that it carries the printed sheets
50 away from the press so rapidly that although the sheets are overlapped the overlap is much less than usual and undue bulk in the mass

caused by such overlapping of the sheets is prevented, the comparatively thin layer of sheets thus formed being readily handled by
55 the double-belt conveyer and being delivered by the latter onto a belt traveling at a much slower speed, so that on this latter belt the sheets will be piled almost directly one above the other for convenient handling by the attendant or attendants there located. 60

In the drawings, 1 represents part of the frame of an ordinary high-speed press, 2 the delivery fan or flier of the same, and 3 a shaft constituting or driven from one of the shafts
65 of the press and having a sprocket-wheel 4 and a clutch-wheel or pulley 5, Fig. 4, of any desired character, so that by the operation of a lever 6 the rotation of the shaft can be stopped or started, as desired. 70

The sprocket-wheel 4 receives a chain belt 7, which drives a larger sprocket-wheel 8 and passes around idler-pulleys 9, 10, and 11, as shown in Figs. 1 and 3.

One set of conveyer-belts 14 passes around
75 drums or pulleys 13, which can turn loosely on a shaft 12 of the press, three of such belts being comprised in the set in the present instance, as shown in Fig. 4, and the shaft which carries the sprocket-wheel 8 has a drum
80 15, which receives another set of conveyer-belts 16, corresponding with the belts 14 and operating in conjunction with the same to form the double-belt conveyer, the drum 15 serving as the primary driving device for said
85 conveyer.

The press has, as shown in Fig. 3, the usual fixed stop-fingers *a* for determining the position of the printed sheet when it is dropped onto the conveyer-belts 14 by the flier 2 and
90 the movable fingers *b*, which project beyond the fingers *a* and are normally out of action, but are lowered at predetermined intervals, so that certain sheets—say every fiftieth sheet—will not be drawn back as far as usual,
95 such projecting sheets serving as a means of keeping count of the number of sheets delivered by the press.

The mechanism for operating the fingers *b* is as usual and is represented in a somewhat
100 exaggerated manner in Fig. 3, so as to clearly illustrate it.

The fingers *b* are carried by a rock-shaft *d*, which has an arm *f* with roller *i*, adapted to

drop into a notch *m* in a disk *n*, which is secured to the shaft 12, this shaft being driven from the flier-shaft through the medium of a worm *t*, worm-wheel *v*, shaft *w*, and bevel-wheels *x* and *y*.

Usually the delivery-belt of the press is driven by the shaft 12; but owing to the much higher speed of the conveyer which I employ the drum or drums 13 for the belts 14 of said conveyer are free to turn on the shaft 12, and hence can be driven at any desired rate of speed irrespective of the speed of said shaft 12.

As shown in the drawings, the double belts are guided by pulleys 17 on shafts mounted in bearings in vertical frames or standards 18, which extend from the press-room floor to the floor above, the shafts of the upper guide-pulleys being mounted in bearings in frames 19, Fig. 2, and being so disposed that the double runs of the belts will discharge forwardly onto the delivery-belt 20, which is by preference slightly below the point of delivery of the double-belt conveyer.

The return runs of the belts 14 are guided by suitable pulleys 21, and the return runs of the belts 16 are guided by suitable pulleys 22, any of these pulleys being adjustable for tightening purposes or special tighteners being employed, if desired.

It is not advisable to rely upon the drum 15 as the sole means of driving the conveyer-belts. Hence I provide for imparting driving motion to certain of the guide-pulleys 17 throughout the run of the conveyer, this being effected in the following manner: On the shaft of the drum 15 is a sprocket-wheel 23, which drives a chain 24, the latter passing around and driving a sprocket-wheel 25 on the shaft of the lowermost set of guide-pulleys 17, extending thence upwardly to a sprocket-wheel 26 on the shaft of a higher set of guide-pulleys and thence back around an idler 27 to the drive-wheel 23. At the opposite end of the shaft which carries the sprocket-wheel 26 is a similar sprocket-wheel 28, Fig. 4, which by means of a chain 29 drives a sprocket-wheel on the shaft of a still higher set of pulleys, and the latter by similar means drives a shaft above the same, and so on, so that positive motion is imparted to the conveyer-belts at different points throughout their length.

As shown in Figs. 1 and 2, the uppermost pulleys 17 are driving-pulleys, their shaft having a sprocket-wheel for receiving the uppermost drive-chain, and both the uppermost pulleys 22 and the uppermost pulleys 17 are flanged, so as to laterally guide the belts 16. The shaft carrying the uppermost pulleys of the belts 16 is geared to that carrying the uppermost pulleys of the belts 14 by means of a spur-gearing, (indicated by the dotted circles in Fig. 2,) so that the uppermost pulleys of both sets of belts are positively driven.

Suitable tighteners are used in connection

with the sprocket-chains, so as to maintain them at all times in proper driving condition.

The belts cannot confine the printed sheets so closely between them as to carry them directly upward to the full extent of the lift of the conveyer, it being necessary to deflect the belts at intervals in order to cause them to nip the printed sheets between them, and in order to lessen the friction which would be caused if the belts were deflected at each successive pulley throughout the run I carry the double runs of the belts around pulleys in pairs, the pulleys being located vertically at a distance apart somewhat less than the width of each of the printed sheets, so that at no time is a sheet free from the nip of the belts.

The driving-drum 30 of the upper delivery-belt 20 is driven from the shaft of the uppermost guide-pulley 17 of the belt 14 by means of spur-wheels 31, 32, 33, and 34, Fig. 6, so that the speed of said belt 20 is very much less than that of the belts 14 and 15. Consequently the printed sheets which are carried upward by the conveyer-belts with their edges two or three inches apart will be delivered onto the delivery-belt 20 with their edges but slightly out of line or, in other words, in piles which can be conveniently handled by the attendants at the delivery-belt.

Although I have described my invention as applied to a lifting-conveyer, and although it is mainly intended for use in this way, it can be used in connection with a horizontal conveyer as well, if desired.

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

1. The combination of the delivery mechanism of a printing-press, with a double-belt conveyer and mechanism for driving the same at such a speed in respect to the speed of the press that the printed sheets will be laid upon the receiving-run of the conveyer so as to overlap each other so slightly as to form a comparatively thin layer, which can be gripped between the double runs of the belts, substantially as specified.

2. The combination of the delivery mechanism of a high-speed printing-press, with a double-belt conveyer, mechanism for driving the same at such speed in respect to the speed of the press that the printed sheets are deposited upon the receiving-run of the conveyer so as to overlap each other so slightly as to form a comparatively thin layer and are gripped between the double runs of the belts, a delivery-belt onto which the double-belt conveyer discharges, and means for driving said delivery-belt at a slower speed than the conveyer, whereby the thin layer of sheets carried by the conveyer will be deposited almost one above another so as to form a thicker pile on the delivery-belt, substantially as specified.

3. The combination in a double-belt elevator-conveyer, of driving-drums for the belts,

guide pulleys or drums for directing the double belts in their upward run, and means for imparting positive rotating motion to said guide pulleys or drums at intervals throughout the run of the conveyer, substantially as specified.

4. The combination of the sheet-delivery mechanism of a high-speed printing-press, the movable stop-finger and its operating mechanism, and a delivery-belt, driven independently of said stop-finger mechanism, substantially as specified.

5. The combination of the sheet-delivery mechanism of a high-speed printing-press, the

movable stop-finger and its operating mechanism, a delivery-belt driven independently of said mechanism, and guide pulleys or drums for said belt mounted so as to turn loosely on a shaft of said stop-finger mechanism, substantially as specified.

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

FRANK C. STOCKHOLM.

Witnesses:

H. HAYES AIKENS,
F. E. BECHTOLD.