

(No Model.)

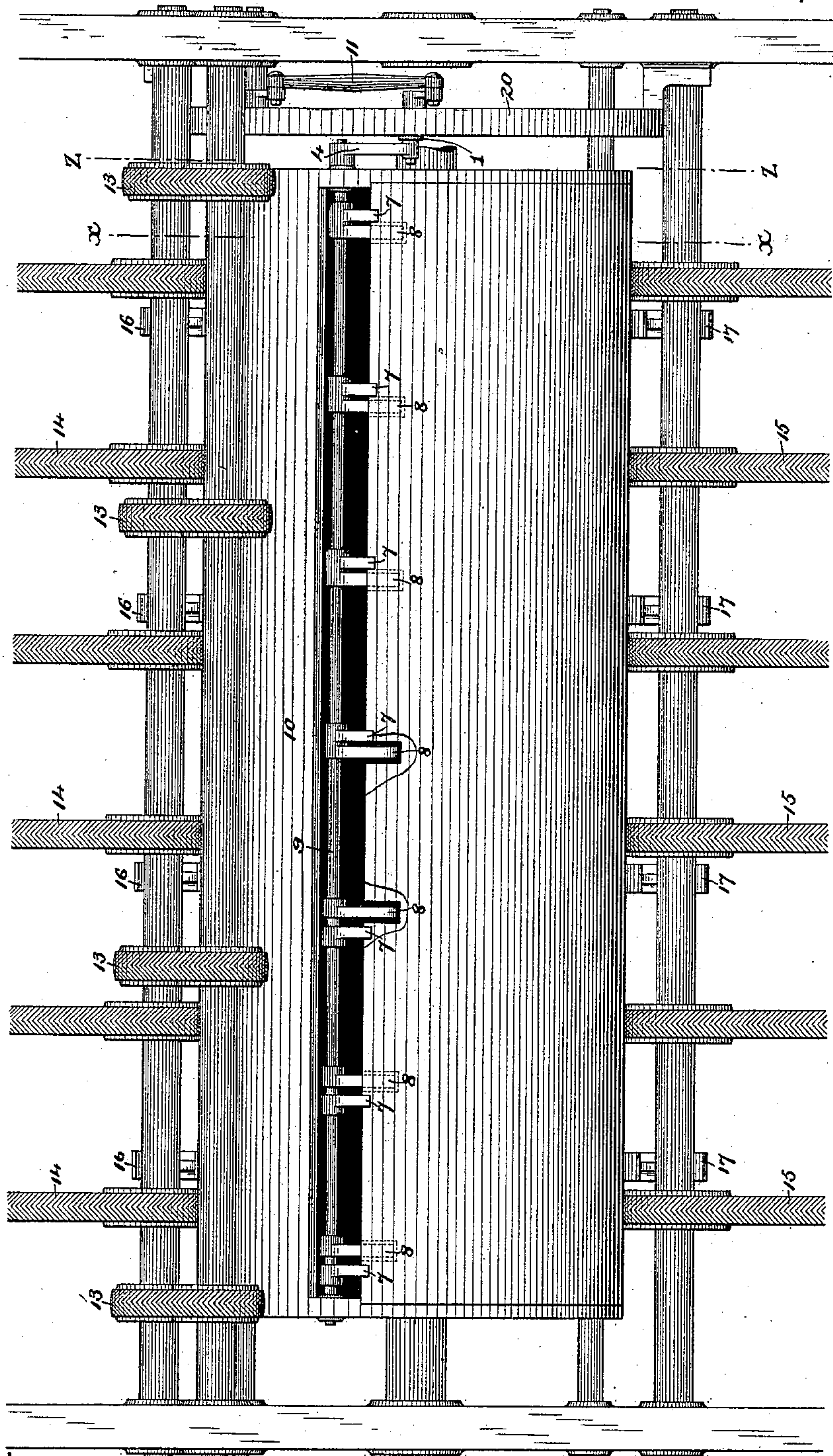
2 Sheets—Sheet 1.

L. C. CROWELL.  
SHEET DELIVERY APPARATUS.

No. 312,258.

Patented Feb. 17, 1885.

Fig. 1.



Witnesses,

C. C. Perkins.  
A. N. Jasbera.

Inventor,

Luther C. Crowell,  
by  
Munson & Philipp  
Attys

(No Model.)

2 Sheets—Sheet 2.

L. C. CROWELL.  
SHEET DELIVERY APPARATUS.

No. 312,258.

Patented Feb. 17, 1885.

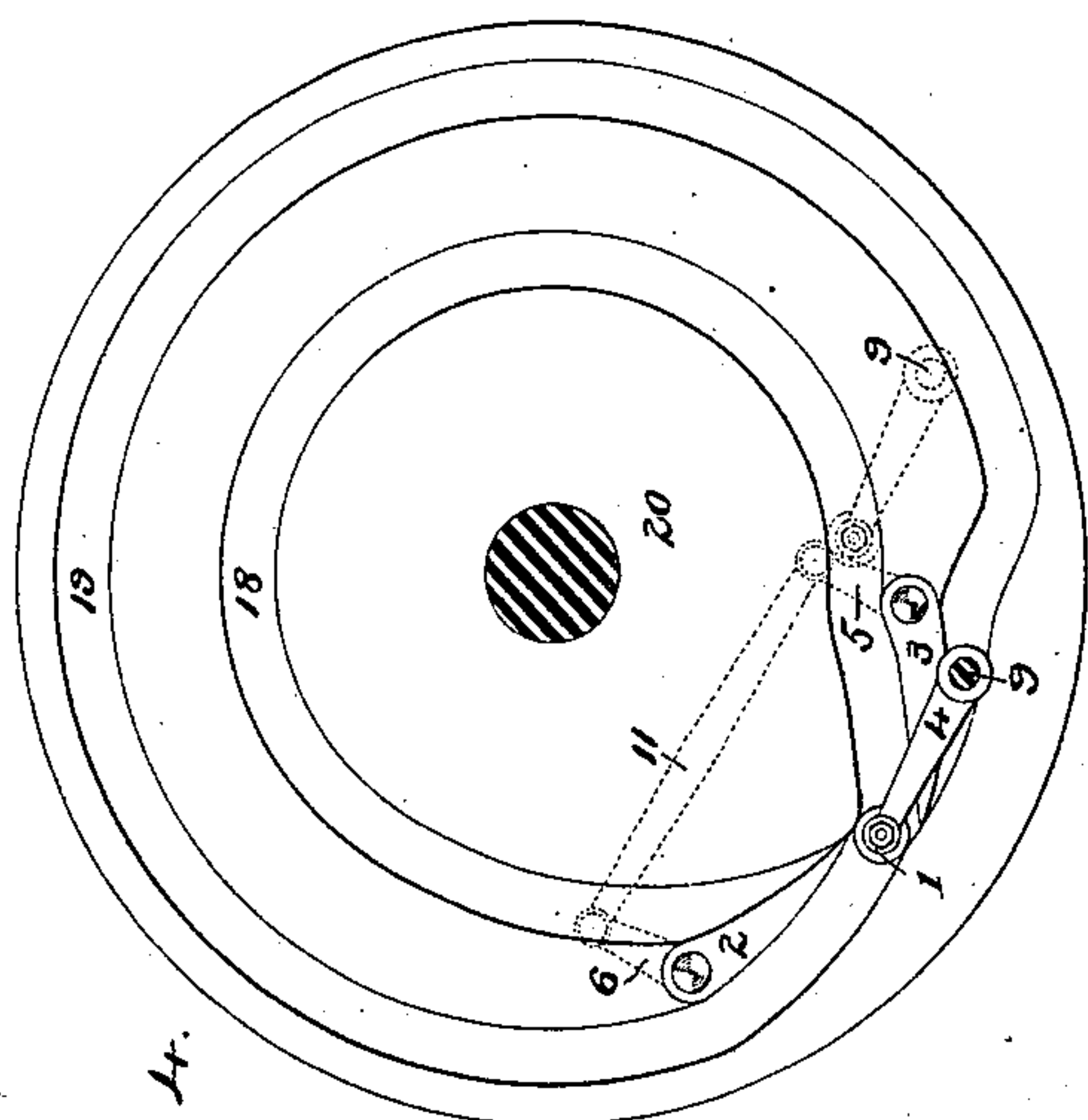


Fig. 4.

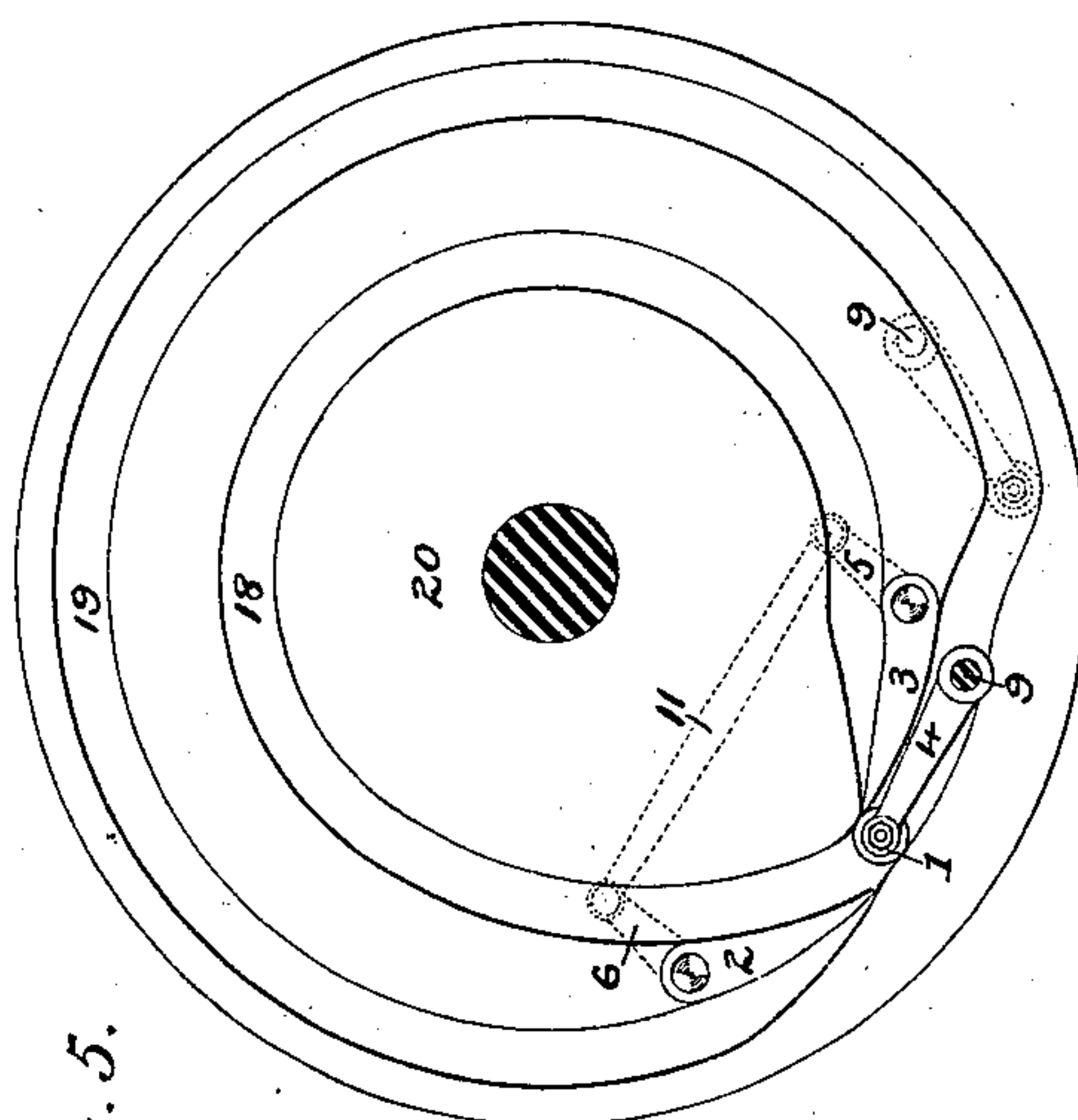


Fig. 5.

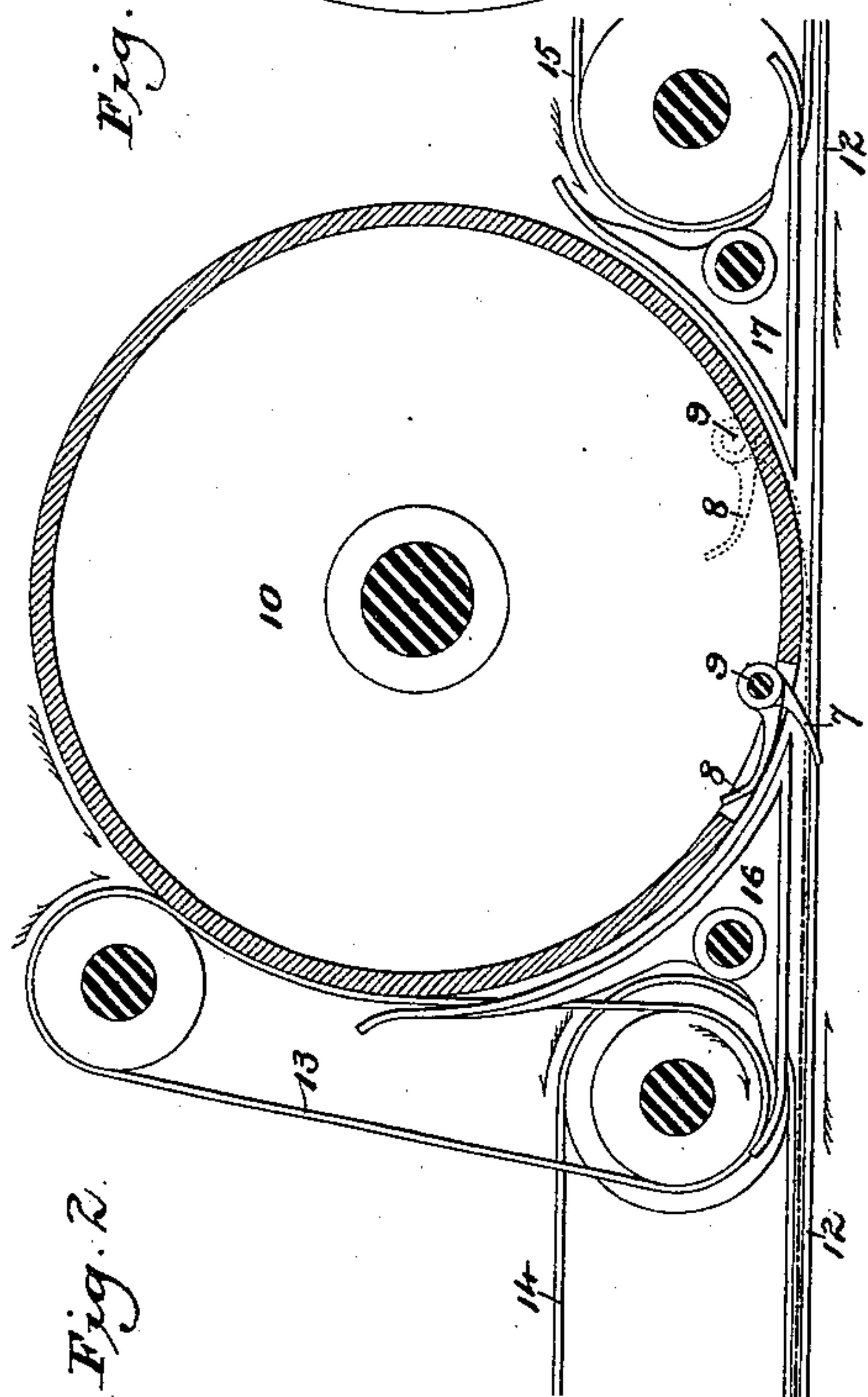


Fig. 2.

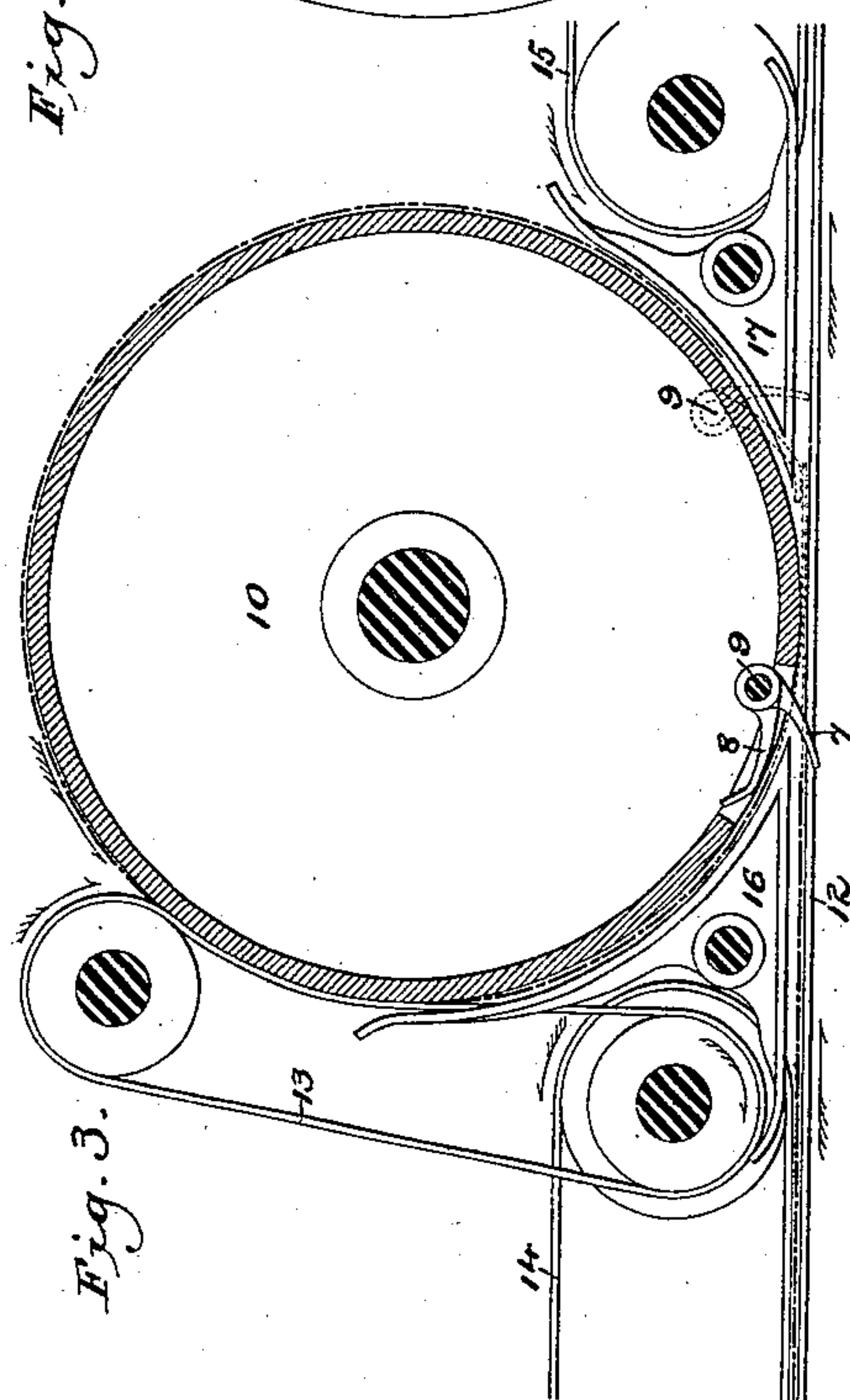


Fig. 3.

Witnesses,

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# UNITED STATES PATENT OFFICE.

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NEW YORK, N. Y.

## SHEET-DELIVERY APPARATUS.

SPECIFICATION forming part of Letters Patent No. 312,258, dated February 17, 1885.

Application filed June 22, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, LUTHER C. CROWELL, a citizen of the United States, residing in the city of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Sheet-Delivery Apparatus, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to an apparatus for the delivery of the sheets issuing from a web printing and severing mechanism, and to that particular part of such an apparatus which is known as the "gathering" or "collecting" cylinder. The general construction and operation of this element of a sheet-delivery apparatus are now so well known to those familiar with the art and have been so frequently described and illustrated in Letters Patent as to render an extended explanation unnecessary to a proper understanding of the present invention. It may not, however, be out of place to say that this part of a delivery apparatus consists simply of a revolving drum or cylinder provided with some form of sheet grasping and retaining devices, and arranged so that some portion of its periphery will lie in the path of travel of the series of sheets issuing from the printing or cutting cylinders.

In operation the first sheet is taken by the grasping devices and carried around upon the cylinder so as to be brought directly above or below the next succeeding sheet, (according as the cylinder is located above or below the path of the sheets,) the two sheets thus brought together being then folded or otherwise directed off the cylinder, or else taken by the grasping devices and carried around upon the cylinder so as to be associated with the third sheet, and so on until the desired number of sheets are associated upon the cylinder, when the whole are folded or otherwise directed off in a single body. The grasping devices which have usually been employed upon these cylinders are ordinary sheet-grippers, and the sheets, when not folded from the cylinder, have usually been directed or discharged therefrom by means of oscillating switches, the points of which were at the

proper time thrown within the periphery of the cylinder. These switches, while serving well for the purpose intended, are to some extent objectionable, because of the extra mechanism required for their operation.

It is the object of the present invention to provide means by which the sheet or sheets may be thrown off or directed from the cylinder without the intervention of switches; and to that end the invention consists, principally, in the combination, with a pathway in which a line or series of sheets are caused to advance, of a gathering-cylinder provided with means for taking certain of the sheets from the pathway, and for carrying them around upon its surface, and carrying discharging-fingers, which are so located upon the cylinder as to act upon the leading ends of the sheets so taken and direct them back into the pathway in such position that they will be associated and pass forward together with the sheets not taken.

The invention also embraces various other details of construction and combinations of parts, all of which will be hereinafter fully explained and particularly pointed out.

In the accompanying drawings, Figure 1 is a plan view of a gathering or collecting cylinder embodying the present invention in one of its forms. Figs. 2 and 3 are cross-sections of the same, taken upon the line *xx* of Fig. 1, but showing the parts in a different position for the purpose of illustrating the operation of the sheet grasping and discharging devices; and Figs. 4 and 5 are similar views taken upon the line *zz*.

Referring to said figures, it is to be understood that 12 14 are the ordinary series of accelerated tapes leading from the severing mechanism, and that 10 is a gathering or collecting cylinder of the usual size, located in such position that some portion of its periphery will lie in contact with or in close proximity to the sheets as they pass forward between the tapes 12 14 and guides 16. The cylinder 10 is provided with the usual sheet-grippers, 7, mounted upon a rock-shaft, 9, which is operated by a rock-arm, 4, having a stud or bowl, 1, which lies in the cam-groove of a stationary disk, 20,



and with a series of short tapes, 13, which are arranged and operate in the usual manner to hold the sheets to the cylinder and prevent them from slipping when released by the grippers. The gripper-shaft 9 is also provided with a series of arms or fingers, 8, which are so positioned as to normally lie within the cylinder with their ends beneath the leading end of the sheet or sheets, but which are so operated by the rocking of the shaft 9 as to be thrown outside the periphery of the cylinder at the proper time, so as to throw the leading end of the sheet or sheets away from the cylinder and direct them into the proper channel or pathway without the aid of a switch.

The proper movement of the grippers 7 and discharging-fingers 8 is effected, as before stated, by means of the rock-arm 4, the bowl 1 of which travels alternately in the two cam-paths 18 19 in the face of the disk 20. These two paths, as shown in Figs. 4 and 5, coincide at one point, and are provided with two switches, 2 3, which are connected to each other by the rock-arms 5 6 and link 11, so that the bowl 1 is caused to alternate between the two paths, thereby holding the grippers closed during one revolution of the cylinder, and the discharging-fingers protruded during the next, and so on.

The operation of the gathering-cylinder thus equipped is as follows, (it being understood that the line of sheets passing forward between the tapes 12 14 are separated from each other sufficiently to provide working-spaces between them:) As the first sheet emerges from between the tapes 12 and guides 16 the grippers 7 will be in the position shown in Fig. 2, and the switch 3 will be in the position shown in Fig. 4, so that as the cylinder continues its revolution the bowl 1 will be caused to enter the path 18, thereby closing the grippers, as indicated by dotted lines in Fig. 2, so as to grasp the first sheet and carry it around upon the cylinder. As the cylinder nears the end of its first revolution the stud 1, passing between the switch 2 and the solid wall of the groove 18, will move said switch to the position shown in Fig. 5, which movement will, through arms 5 6 and link 11, move the switch 3 to the position shown in the same figure. At the end of the first revolution the grippers 7 will be opened so as to release the sheet, as shown in Fig. 3, and as the cylinder commences its second revolution the stud 1, owing to the changed position of the switch 3, instead of entering the groove 18 so as to close the grippers, will enter the groove 19, thereby opening the grippers still farther and carrying the discharging-fingers 8 beyond the periphery of the cylinder, so as to throw the leading end of the sheet just released by the grippers away from the cylinder and cause it, together with the second or incoming sheet upon which it is imposed, to pass beneath the guides 17 into the bite of the tapes 12 15, by which the two sheets will be

carried to any suitable folding mechanism or to a fly. Just before the completion of the second revolution the stud 1, passing between the switch 2 and the solid wall of the groove 19, will shift said switch and also the switch 3 back to their original positions, as shown in Fig. 4, so that upon the third revolution the stud 1 will be directed into the groove 18, thereby again closing the grippers so as to take up the third sheet, carry it around upon the cylinder, and associate it with the fourth, and so the operation will continue to be repeated.

The particular mechanism herein shown for operating the grippers and discharging-fingers has been selected merely for the purpose of illustrating the operation of the invention.

Many other forms of mechanism equally well adapted for the purpose can be readily suggested by those familiar with the art.

It will also be apparent to those skilled in the art that the operating mechanism may be so modified without departing from the invention that, instead of two, three or more sheets may be associated and then discharged together, and also that, if desired, the tapes forming the pathway in which the sheets are advanced may be so arranged that the associated sheets will be carried around by or remain in contact with the cylinder during a part of a revolution and then directed back into the pathway.

If preferred, impaling-pins or any of the other well-known devices may be used instead of the grippers for retaining the sheets upon the cylinder, and in any case the discharging-fingers may be operated independently of the retaining devices, if preferred.

What I claim is—

1. The combination, with a pathway, as that formed by the tapes 12 14 15, in which a line or series of sheets are caused to advance, of the gathering-cylinder 10, provided with means for taking certain of the sheets from the pathway and for carrying them around upon its surface, and carrying discharging-fingers, which are so located upon the cylinder as to act upon the leading ends of the sheets so taken and direct them back into the pathway in such position that they will be associated and pass forward together with the sheets not taken, all substantially as described.

2. The combination, with a pathway, as that formed by the tapes 12 14 15, in which a line or series of sheets are caused to advance, of a gathering-cylinder, as 10, provided with sheet-grasping mechanism, as the grippers 7, and discharging mechanism, as the fingers 8, said grasping and discharging mechanisms being mounted upon the same shaft and operated by the same mechanism, all substantially as described.

3. The combination, with a pathway, as that formed by the tapes 12 14 15, in which a



line or series of sheets are caused to advance,  
of a cylinder, as 10, carrying means, as the  
grippers 7, for taking and carrying sheets  
around upon its surface, and also carrying  
5 the discharging-fingers 8, mounted rigidly  
upon the gripper-shaft, all substantially as de-  
scribed.

In testimony whereof I have hereunto set

my hand in the presence of two subscribing  
witnesses.

LUTHER C. CROWELL.

Witnesses:

T. H. PALMER,

J. A. HOVEY.