

(No Model.)

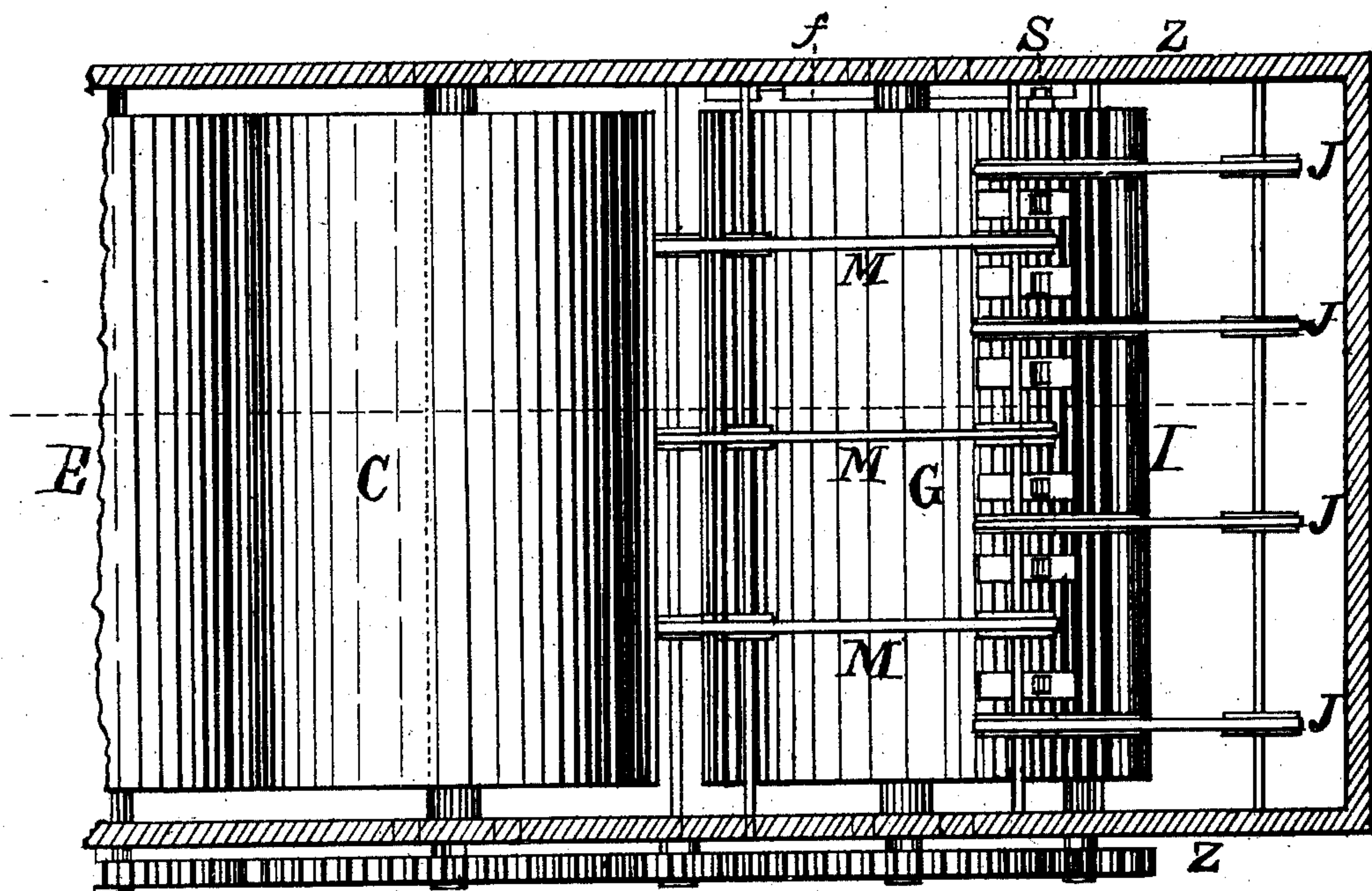
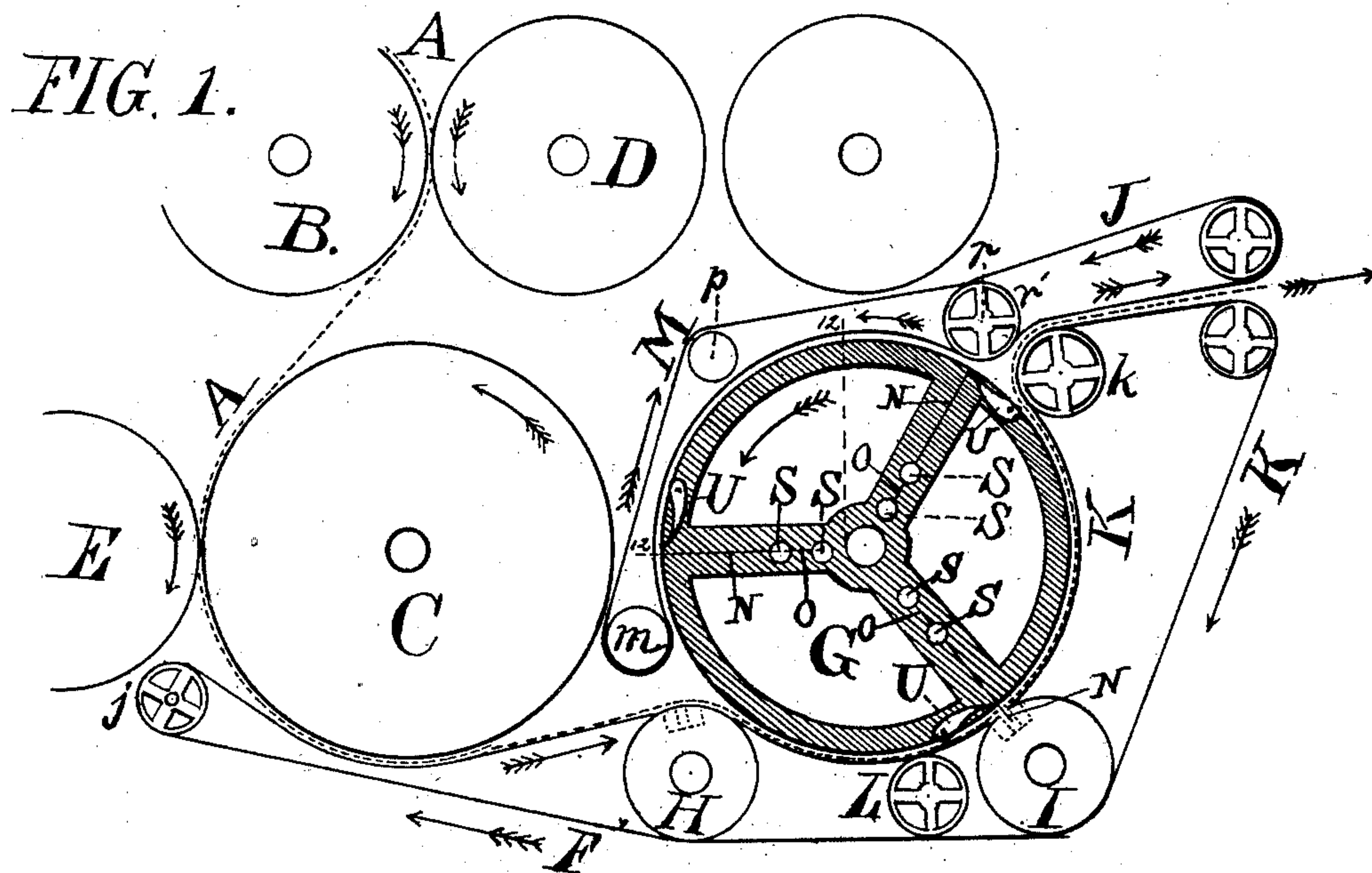
3 Sheets—Sheet 1.

M. P. MEYER.

DELIVERING APPARATUS FOR WEB PRINTING PRESSES.

No. 354,338.

Patented Dec. 14, 1886.



*FIG. 2.*

WITNESSES

*Geo J. Steinhauer*  
*M. S. Olin*

INVENTOR

*Martin P. Meyer*

(No Model.)

3 Sheets—Sheet 2.

M. P. MEYER.

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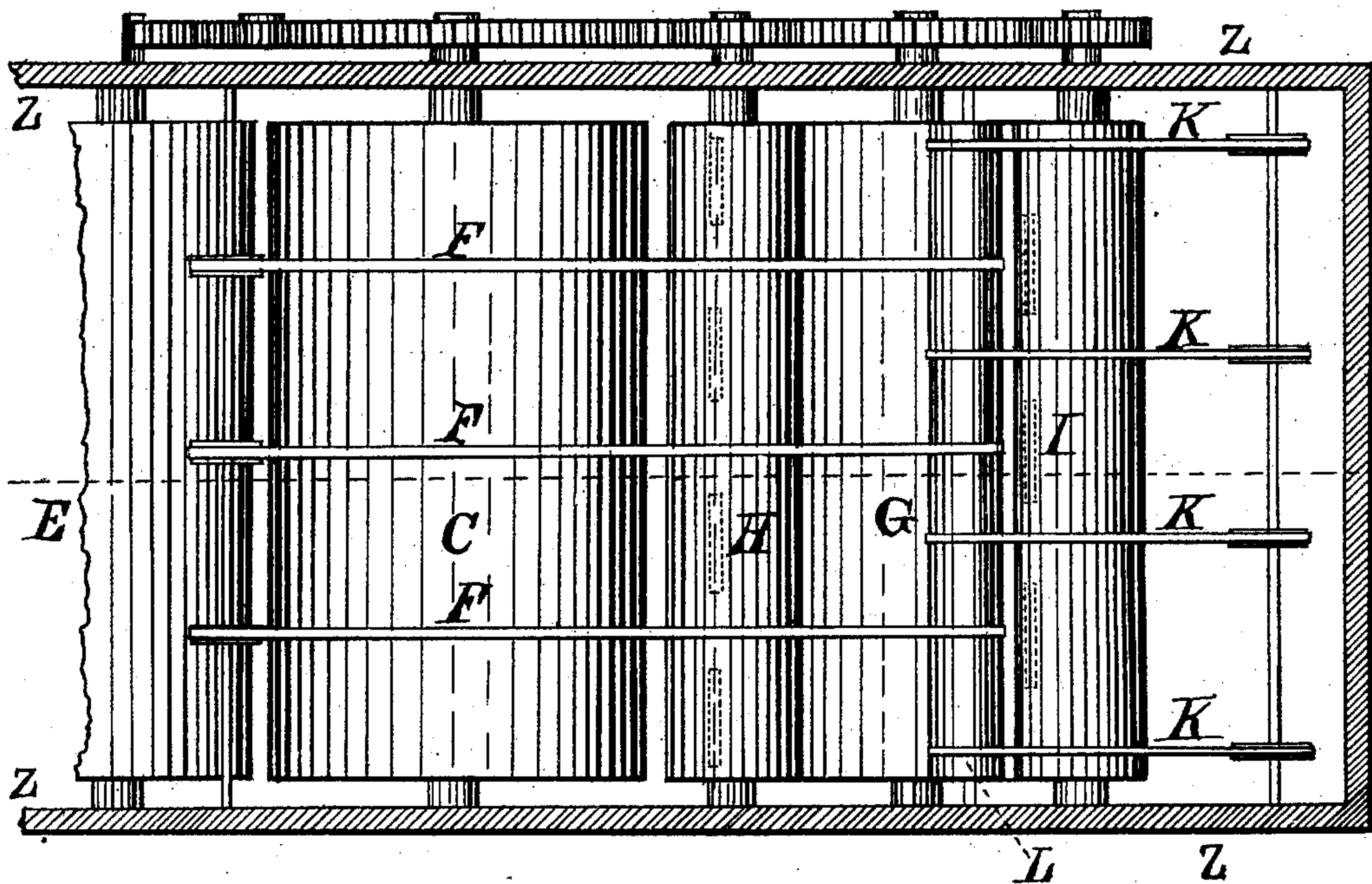
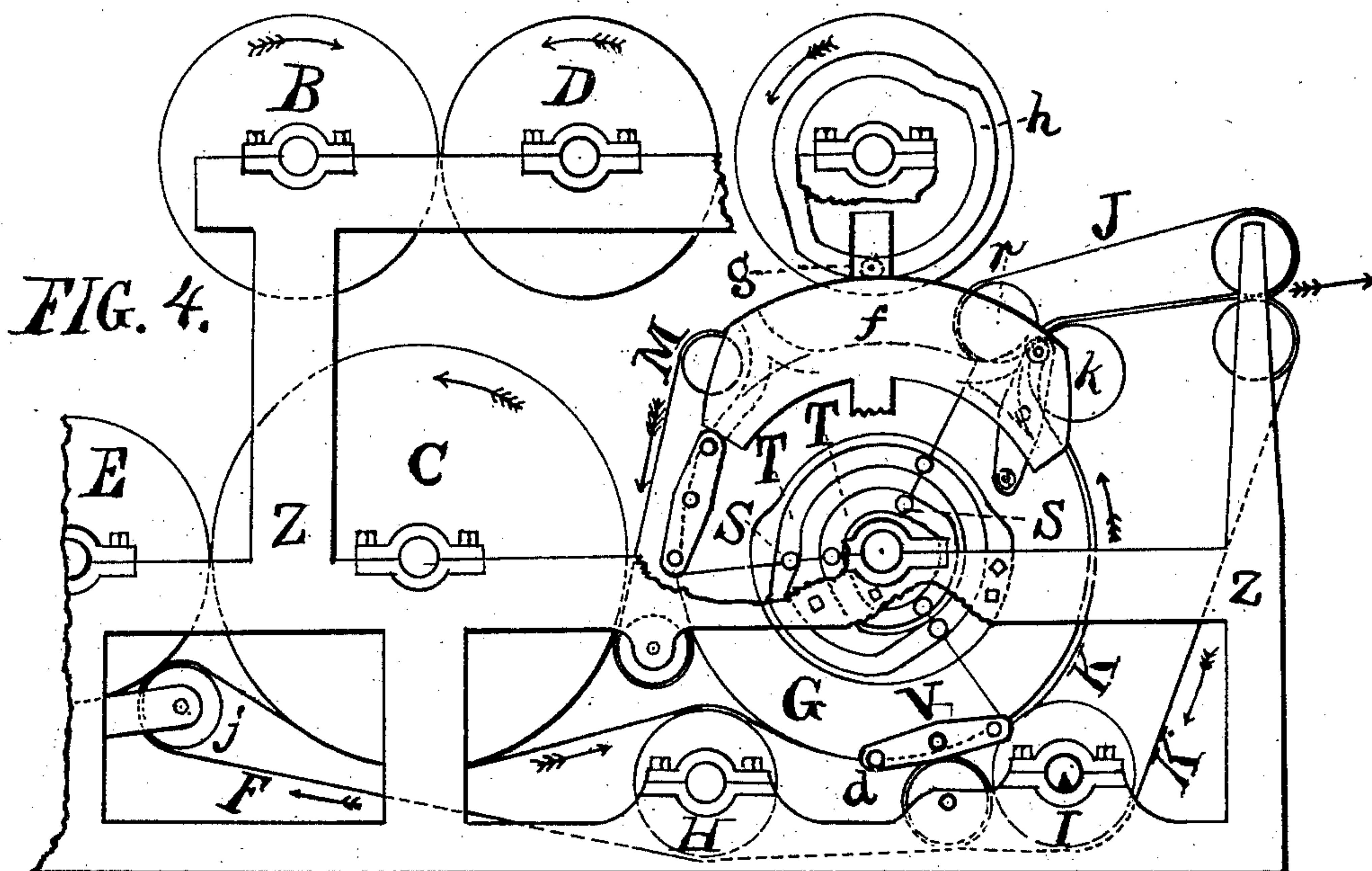


FIG. 3.



WITNESSES

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M. S. Otis

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By



(No Model.)

3 Sheets—Sheet 3.

M. P. MEYER.

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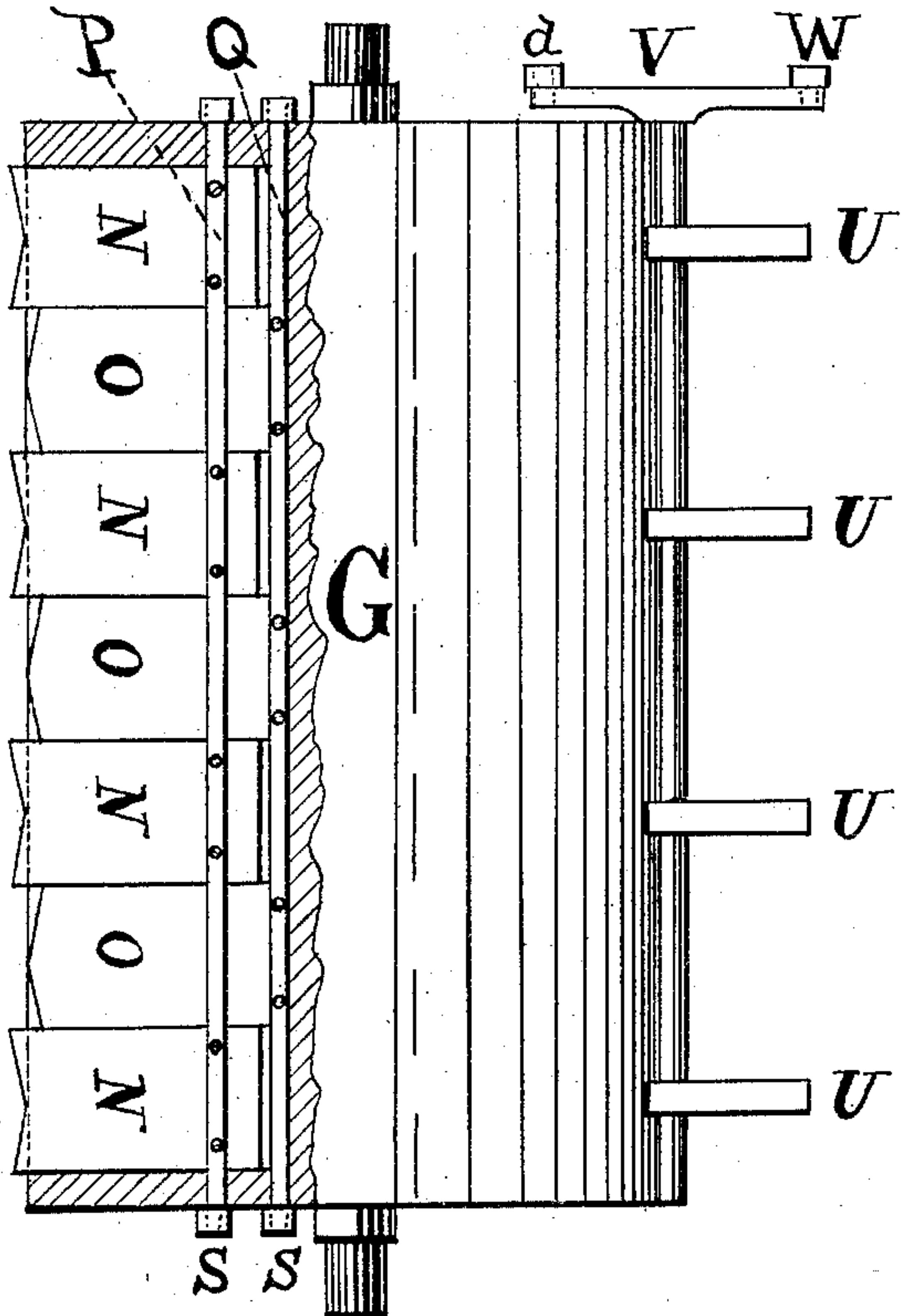
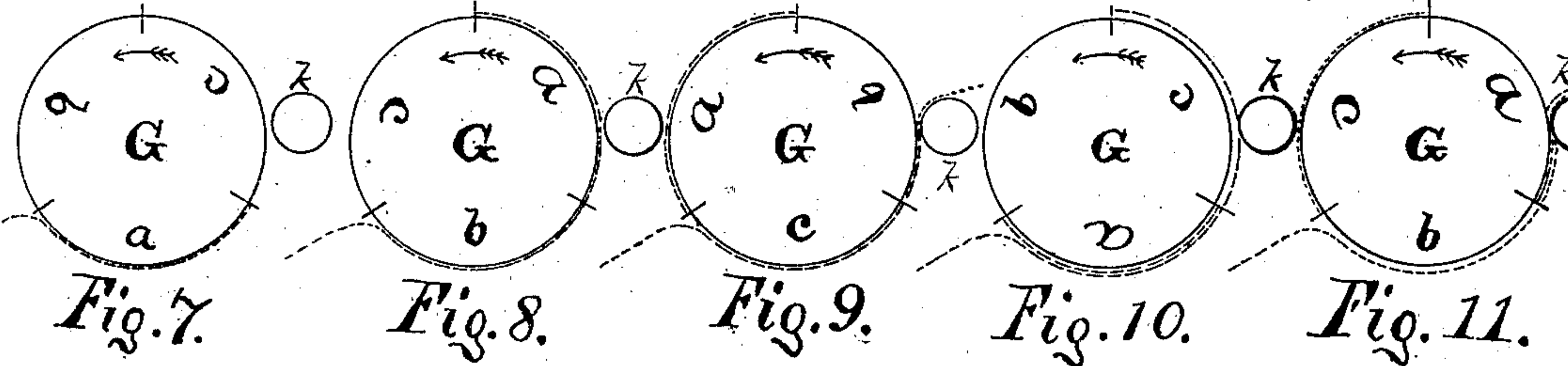
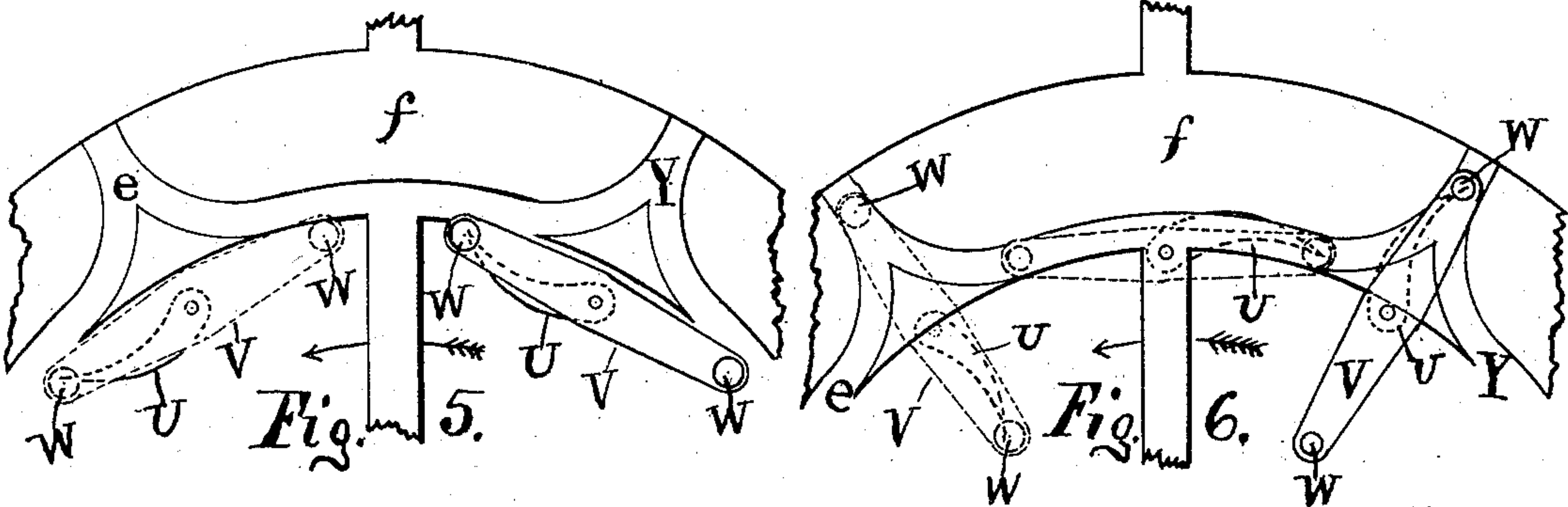


FIG. 12.

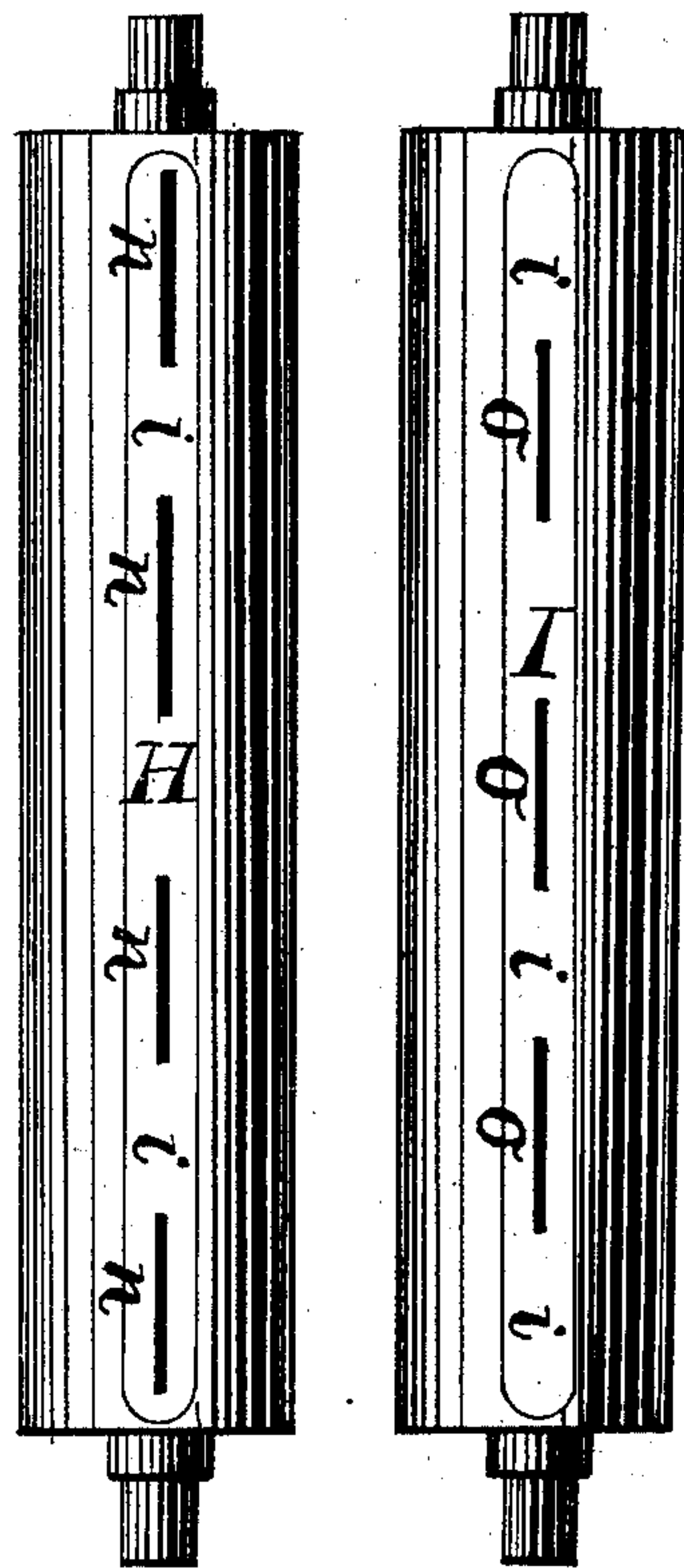


FIG. 13. FIG. 14.

WITNESSES

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INVENTOR

Martin P. Meyer



# UNITED STATES PATENT OFFICE.

MARTIN P. MEYER, OF ROCHESTER, NEW YORK.

## DELIVERING APPARATUS FOR WEB-PRINTING PRESSES.

SPECIFICATION forming part of Letters Patent No. 354,338, dated December 14, 1886.

Application filed March 9, 1885. Serial No. 158,225. (No model.)

*To all whom it may concern:*

Be it known that I, MARTIN P. MEYER, a citizen of the United States, residing at Rochester, county of Monroe, and State of New York, have invented certain new and useful Improvements in Delivering Apparatus for Web-Printing Presses, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to improvements in machines which print upon both sides of paper as it is unwound from a roll, then divide said paper into sheets, bringing the same into proper relation one with another, and discharge them into a folding apparatus.

The principal object of my invention is to accumulate the double sheets of a quarto or eight-page newspaper in suitable relation one with another, so that the two sheets are delivered to a folding mechanism from a web-printing press superposed one upon the other, with inner and outer sheets in their proper relative positions; and to this end my invention consists in a cylinder carrying sets of sectional cutters, the cutters in each set being arranged and operated alternately, in combination with female cutting-cylinders and tapes.

It further consists in a cylinder carrying sets of cutters arranged alternately on movable bars, in combination with cushion-cylinders, tapes, and the rollers and grooved cams whereby said bars and cutters are operated.

It consists, further, of a superposing-cylinder, in combination with revolving delivery-fingers, the rollers which are connected to said fingers, and the cam-grooved plate having vertical motion, the grooves in said plate serving to engage said rollers and cause said fingers to turn.

It consists, further, in the combination of a cutting-cylinder and the knives contained therein with a series of independently-revolving delivery-fingers and a plate provided with cam-surfaces, which are the sole means of causing said motion of the delivery-fingers, as set forth.

It consists, further, in the combination of revolving discharging-fingers and alternately-operating sets of cutters, both fingers and cutters being carried by the superposing-cylinder, with the said cylinder and tapes or bands.

It consists, further, of a superposing-cylin-

der, in combination with alternately-arranged sets of cutters in said cylinder, the carrying-tapes, and cushion-cylinders, one of these latter being recessed to receive the stroke of one set of cutters, and the other cushion-cylinder being recessed to receive the other set.

It consists, further, in a vertically-movable plate provided with pelecoidal cam-grooves, in combination with a crank-shaft having rollers which enter said grooves, a superposing-cylinder in which said shaft is mounted, and delivery-fingers carried by said shaft and rotating therewith.

It further consists of a vertically-movable plate provided with cam-surfaces, in combination with a superposing-cylinder and delivery-fingers having cranks which engage with said cam-surfaces as said cylinder rotates.

In the accompanying drawings, Figure 1 is a vertical section of my improvements, showing a portion only of a web printing press, the remainder of which is omitted, as it forms no part of my present invention; Fig. 2, a plan or top view of the apparatus with gearing; Fig. 3, a bottom view with gearing; Fig. 4, a side elevation with frame, part of which is broken away to facilitate illustration. Gearing is here omitted. Fig. 5 is an enlarged detail showing fingers passing raised frogs; Fig. 6, enlarged detail showing fingers engaged, by means of crank, with the lowered frogs; Figs. 7, 8, 9, 10, and 11, details showing, respectively, the various arrangements of sheets in passing around the superposing-cylinder and being discharged; Fig. 12, an enlarged detail plan view of the superposing-cylinder, broken away on one side to show a horizontal section of the interior on the line 12 of Fig. 1, taken just above one set of cutters in the position there shown; Figs. 13 and 15, enlarged details showing, respectively, the first and second female cutting-cylinders.

Similar letters refer to similar parts throughout the various views.

A is the paper as it enters the press. B and C are respectively the first and second blanket-cylinders; D and E, the type-cylinders; F, the carrying-tapes; G, the superposing-cylinder; H and I, the female cutting-cylinders; J K, discharge-tapes; L, intermediate tape-drum; M, tape for retaining sheets upon cylinders.

My improvement is designed to be used in



connection with any description of web-press, and such mechanism, being well known, requires no further description here.

The web of paper A passes through the various cylinders of a web-press, and is taken thence by the tapes F to the first cutting-cylinder and superposing-cylinder, where a set of knives projecting from superposing-cylinder pass through the paper. This set of knives is so arranged that between each knife a space of about the width of the knife is left uncut. The partly-cut sheet is then carried by the tapes F, which are arranged in such a manner as will allow them to pass between the first set of knives, N, without interference to the intermediate tape-drum, where the discharging-tapes K take it up and carry it through between superposing-cylinder G and female cutting-cylinder I, where another set of knives, O, extended from superposing-cylinder pass through the sheet, completing the cut. The tapes K are arranged with reference to their passing between knives O without interference. The severed sheet then passes to its destination, being held against the superposing-cylinder by the discharging-bands K.

To bring two sheets into proper relationship with each other, the first severed sheet is held against a segment of and moves with the superposing-cylinder G, as shown by dotted line under segment a, Fig. 7. It then continues on a, as shown in Figs. 8 and 9. At the next one-third revolution, Fig. 10, it is underlaid by its companion sheet, which is cut off, and continues in movement with superposing-cylinder until thrown off, as shown in Fig. 11. Fig. 8 also shows (represented by dotted lines) the web being run on segment b. After being cut off and arriving at the discharging-pulley k, as shown in Fig. 9, it passes out and is carried away to folder without a companion sheet. This is incidental only in starting the apparatus. Fig. 9 shows the web running under segment c. Fig. 10 shows cut-off sheet passing discharging-pulleys without entering them, and Fig. 11 shows the same sheet upon segment c just entering into relationship with its companion sheet. Fig. 10 shows the relative position occupied by the single and double sheets during a revolution of the apparatus. Accompanying table more fully illustrates the process.

	Beginning first revolution.	Outside 1	Inside	Outside 2	End first revolution.	
30	" second "	Inside	Outside 3	Inside	" second "	95
	" third "	Outside 4	Inside	Outside 5	" third "	
	" fourth "	Inside	Outside 6	Inside	" fourth "	100
	" fifth "	Outside 7	Inside	Outside 8	" fifth "	
35	" sixth "	Inside	Outside 9	Inside	" sixth "	
	" seventh "	Outside	Inside	Outside	" seventh "	

Each line represents the order in which the inner and outer sheets of a newspaper leave a printing-cylinder and as they are taken up during a revolution of the superposing-cylinder. The cut and superposed sheets are discharged in the order indicated by the numbers, a complete eight-page newspaper being represented by the space defined by the lines forming each square.

The frame Z, wherein these improvements are supported, may be of any construction that may be found suitable, and may be made separate and attached to or form part of the main frame of a press, or, when practical, may be put in place of other devices.

The apparatus may be actuated by means of any of the gear-wheels of the press to which it may be attached.

The superposing-cylinder G is divided longitudinally into three equal parts, each segment being supported by spokes and hubs and mounted upon a suitable shaft, as shown. These spokes, at each end of cylinder, are provided with a properly-constructed bearing-surface, in which are operated, radiatingly, bars P and Q, to which the cutting-knives N O are attached. These bars may be of any suitable size, and may be of any practical proximity one to another. Upon bar P, between

each segment, are properly attached, at distances apart equaling their width, cutters N, constructed of steel of suitable thickness, the edges of which are obtuse-angle-shaped, with highest points at outside, of such length and breadth as may be most practical. Upon bars Q cutters O are attached in a manner so as to fit into the spaces left between cutters N. The edges of these are obtuse-angular, with highest point in center.

The construction of cutters N O and bars P Q is with reference to having either set of cutters move freely and with precision beside and between its companion set. At the ends the bars P and Q are provided with spools or rollers S, which, moving in properly-constructed cam-channels attached to each side of frame, cause the cutters attached to their respective bars to be operated out or inward. The segments are provided at or near the arc-line throughout their entire length with suitable bearing-surfaces, between which the cutters N O are operated. At suitable distances apart rectangular openings are made of such size as will admit of the revolving of the discharging-fingers U. Following the cutters, and at a distance from them of a quarter of an inch in excess of the length of the revolving fingers, there are provided at each end of the seg-



ments suitable bearings for shafts, upon which are mounted the revolving fingers U. These fingers are of such shape as will cause the paper being discharged by them to assume the proper curve to follow around the discharging-pulleys into the discharging-tapes J K.

The finger-shaft is operated by a double crank, V. When in operation, the fingers being turned toward the cutters, the rollers W, being on a line with the points of fingers, enter the first pelecoidal cam-channel, Y, making a quarter-turn upward, remaining stationary while center of finger-shaft passes through the radial line, then moves downward through opposite half of pelecoid a second quarter-turn. The spools *d* at opposite end of the crank then enter and move through the second pelecoidal cam-channel, *e*. Upon emerging from channel *e* spools *d* will have caused the completion of an entire revolution of the finger-shaft. Cam channels Y and *e* have the form of two inverted quadrants, somewhat modified at their entrances and exits to allow spools W and *d* to enter readily at great speed, the form of Y being of such shape as will cause the fingers to follow the face of the discharging-pulleys at a distance of an eighth of an inch. The plate *f*, supporting the pelecoidal cam-grooves, is provided with a downward-extending arm, which operates through a suitable socket attached to the inside of the frame of the press, for the purpose of obtaining a vertical movement. An arm also extends upward, having at the proper location, revolving upon a stud, a roller, *g*, which operates in a cam-groove, *h*, attached to end of ink-cylinder. This arm also operates through a socket to secure a vertical movement.

The cam-groove *h*, as shown, is so constructed that at each revolution it causes the pelecoidal-groove plate *f* to move upward and remain so sufficiently long to enable cranks W and *d* of one segment to pass without engaging, and then to move downward, and remaining so until the cranks W and *d* of following segment have passed through the pelecoids, the fingers being operated. The groove-cam *h* is set or timed by being bolted to the end of the cylinder in such a position that in its movement it will cause all double sheets to be discharged, while single sheets will be allowed to pass around superposing-cylinder to meet their companion sheets. The cam-channel *h* can be attached to any cylinder making one revolution to the printing of a complete paper by modifying the construction of the arms and slots.

The cushions *i* of the cutting-cylinders H and I are provided with recesses, a special one for each cutter acting in combination with them, respectively. As shown, cylinder H has four cutter-recesses, *n*, into which the four cutters N enter, and cylinder I is provided with three recesses for the cutters O. These recesses are of such shape that when cutters are therein a space of one-eighth of an inch is left upon each side, the ends, and at the bottom for play-room. The cushions are flush

with the circumference of the cylinders, and between the recesses form an unbroken bearing-surface for the bands F and K. The cushions may be of any substance that may be found suitable, and are fastened by means of screws in such manner as is most practical.

The carrier-tapes F are continuous bands running from top of pulleys *j* near type-cylinder E, through between the extended cutters N, under superposing-cylinder G, and over female cutting-cylinder H, to and around intermediate drum, L, returning beneath cylinder H to point of starting.

The carrier-tapes K are continuous bands, starting from the top of drum L, running between cutters O, under G, over cylinder I, following cylinder G with sufficient pressure to hold the sheets in position until their arrival at the discharging-pulleys *k*, over which they pass to and around such folding apparatus, cylinder, or pulleys as may be necessary, returning over pulleys so arranged as to prevent them from interfering with the ascending portion thereof, under cylinder I, around drum L to point of starting.

The bands M run from bottom of pulleys *m* upward, around pulleys *p* to pulleys *r'*, to and with cylinder G to point of starting, and are sufficiently tight to hold the paper in position.

The bands J run from bottom of pulleys *r'* into the folding apparatus, returning downward around pulleys *r'* to place of starting.

Pulleys *j*, *k*, *m*, and *p* are fastened to and revolve with their respective shafts, which rest in suitable bearings situated in the frame of the apparatus.

Shaft *r* is fixed stationary, the pulleys over which bands M run revolving around it as actuated by said bands M, while pulleys for J revolve around the shaft *r* in an opposite direction, actuated by the friction of said bands J, which receive their impetus from being caused to run with bands K over part of face-pulleys *k*.

I am aware that prior to my invention web-printing machines having fixed and movable knives in cylinders operated in conjunction with cylinders having cushions have been in use. I therefore do not claim such combination, broadly; but

That which I do claim as my invention, and desire to secure by Letters Patent, is—

1. In a web-printing machine, a cylinder carrying sets of sectional cutters, the cutters in each set being arranged and operating alternately, in combination with female cutting-cylinders and tapes, substantially as set forth.

2. A cylinder carrying sets of cutters arranged alternately on movable bars, in combination with cushion-cylinders, tapes, and the rollers and grooved cams whereby said bars and cutters are operated, substantially as set forth.

3. The superposing cylinder, in combination with the revolving delivery-fingers, the rollers which are connected to said fingers, and the cam-grooved plate *f*, having vertical motion,



the grooves in said plate serving to engage said rollers and cause said fingers to turn, substantially as set forth.

4. In combination with a cutting-cylinder and the knives contained therein, a series of independently-revolving delivery-fingers, and a plate provided with cam-surfaces, which are the sole means of causing said motion of the delivery-fingers, as set forth.

5. The combination of revolving discharging-fingers and alternately-operating sets of cutters, both fingers and cutters being carried by the superposing-cylinder, with the said cylinder and tapes or bands, substantially as set forth.

6. A superposing-cylinder, in combination with alternately-arranged sets of cutters in said cylinder, the carrying-tapes, and two cushion-cylinders, one of these latter being recessed to receive the stroke of one set of cut-

ters, and the other cushion-cylinder being recessed to receive the other set, substantially as set forth.

7. A vertically-movable plate provided with cam-surfaces, in combination with a superposing-cylinder and delivery-fingers having cranks which engage with said cam-surfaces as said cylinder rotates, substantially as and for the purposes set forth.

8. A vertically-movable plate, *f*, provided with pelecoidal cam-grooves *Y*, in combination with a crank-shaft having rollers which enter said grooves, a superposing-cylinder in which said shaft is mounted, and delivery-fingers carried by said shaft and rotating therewith, substantially as and for the purpose set forth.

MARTIN P. MEYER.

Witnesses:

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M. S. OTIS.