

A. KRAMER.
SHEET FEEDING APPARATUS.
APPLICATION FILED JULY 29, 1910.

985,607.

Patented Feb. 28, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

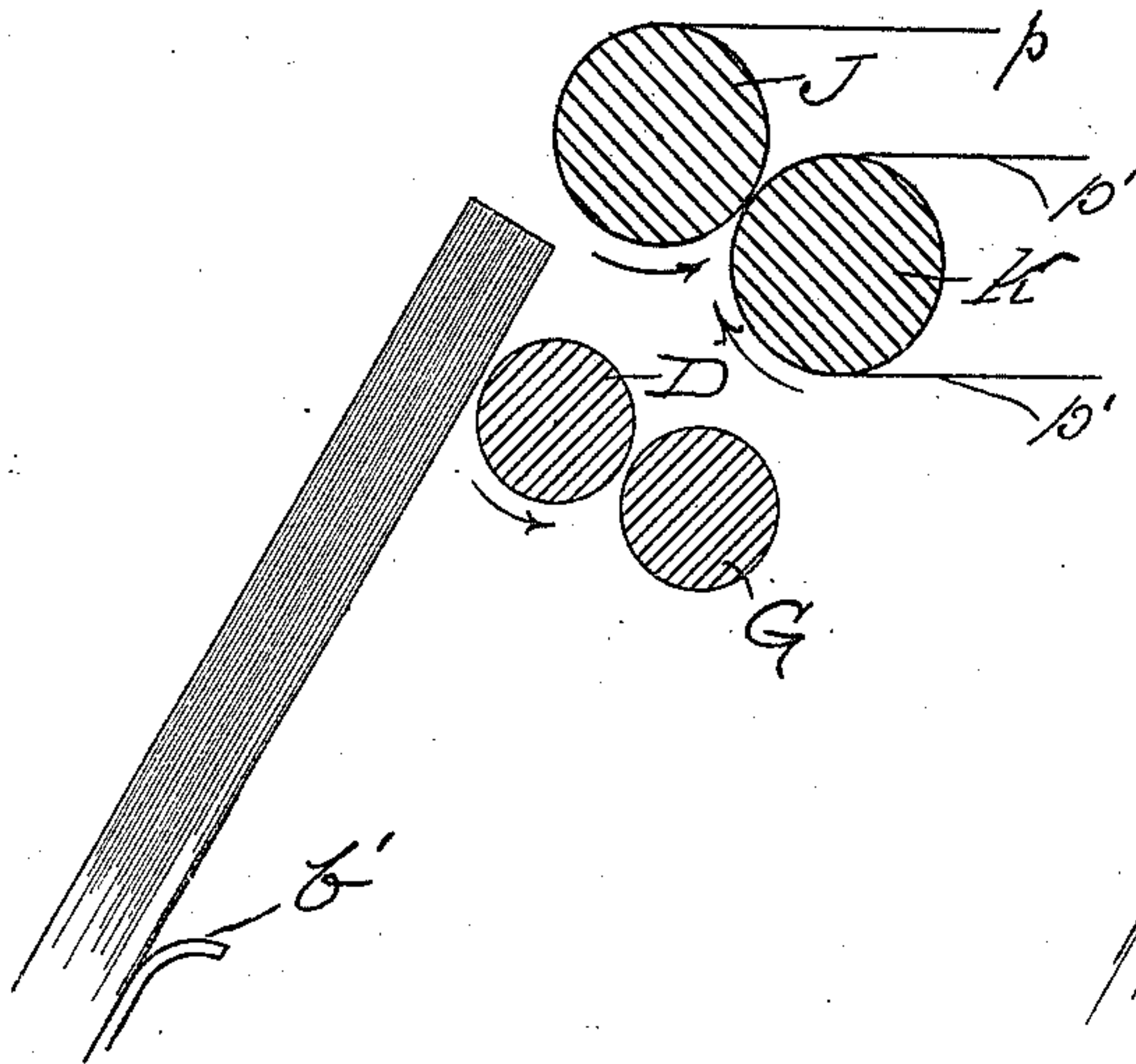


Fig. 2.

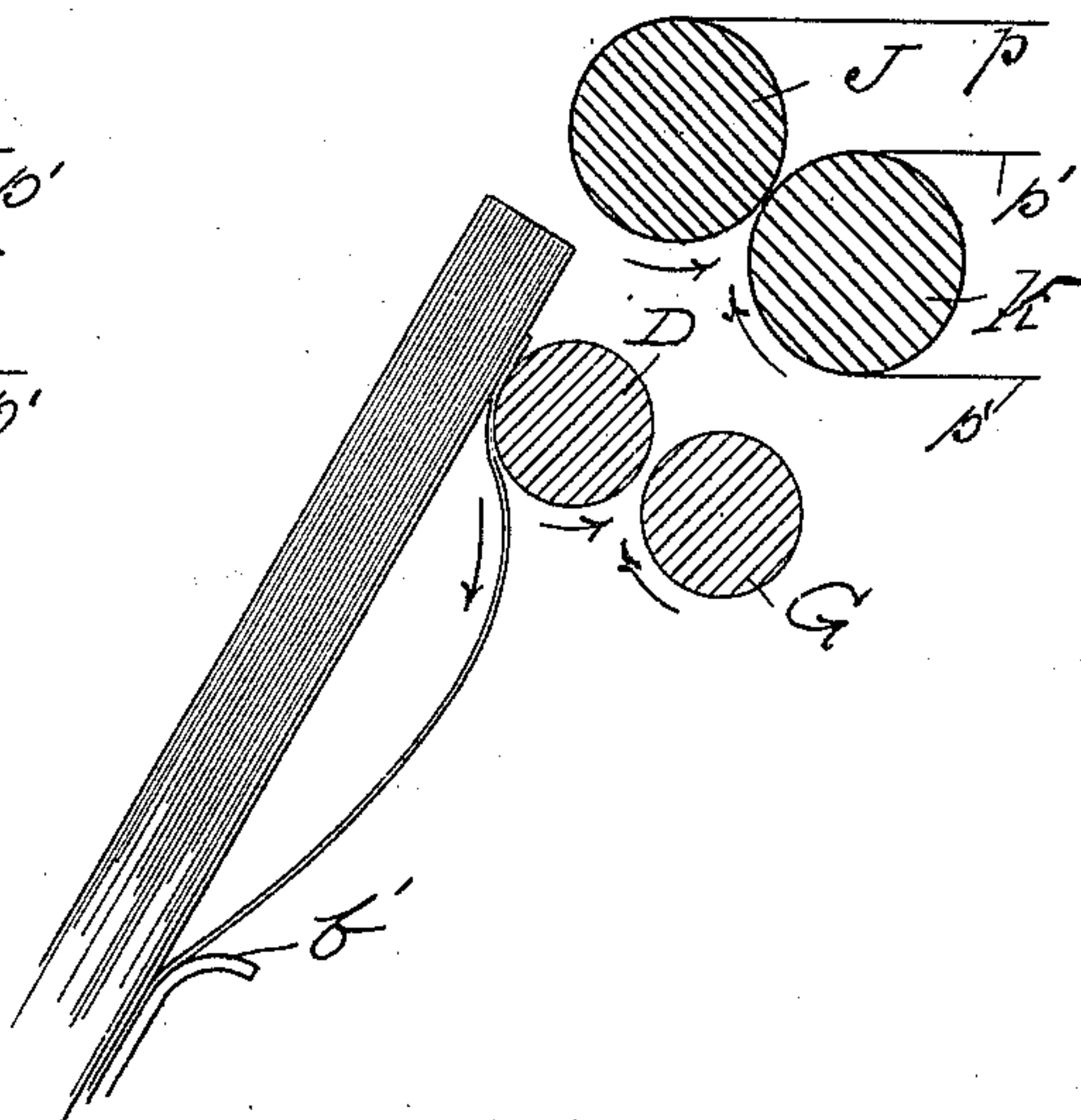


Fig. 3.

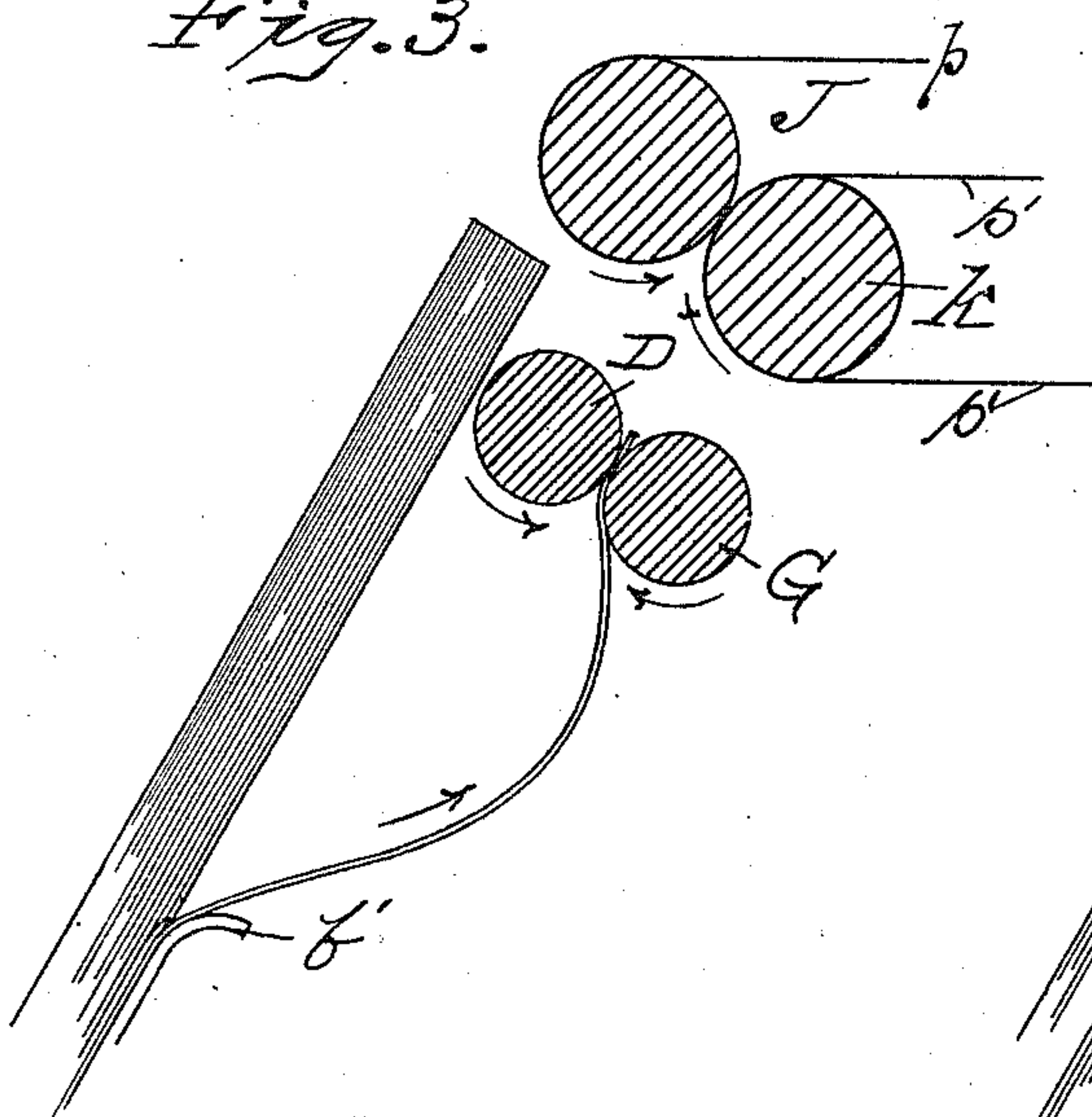
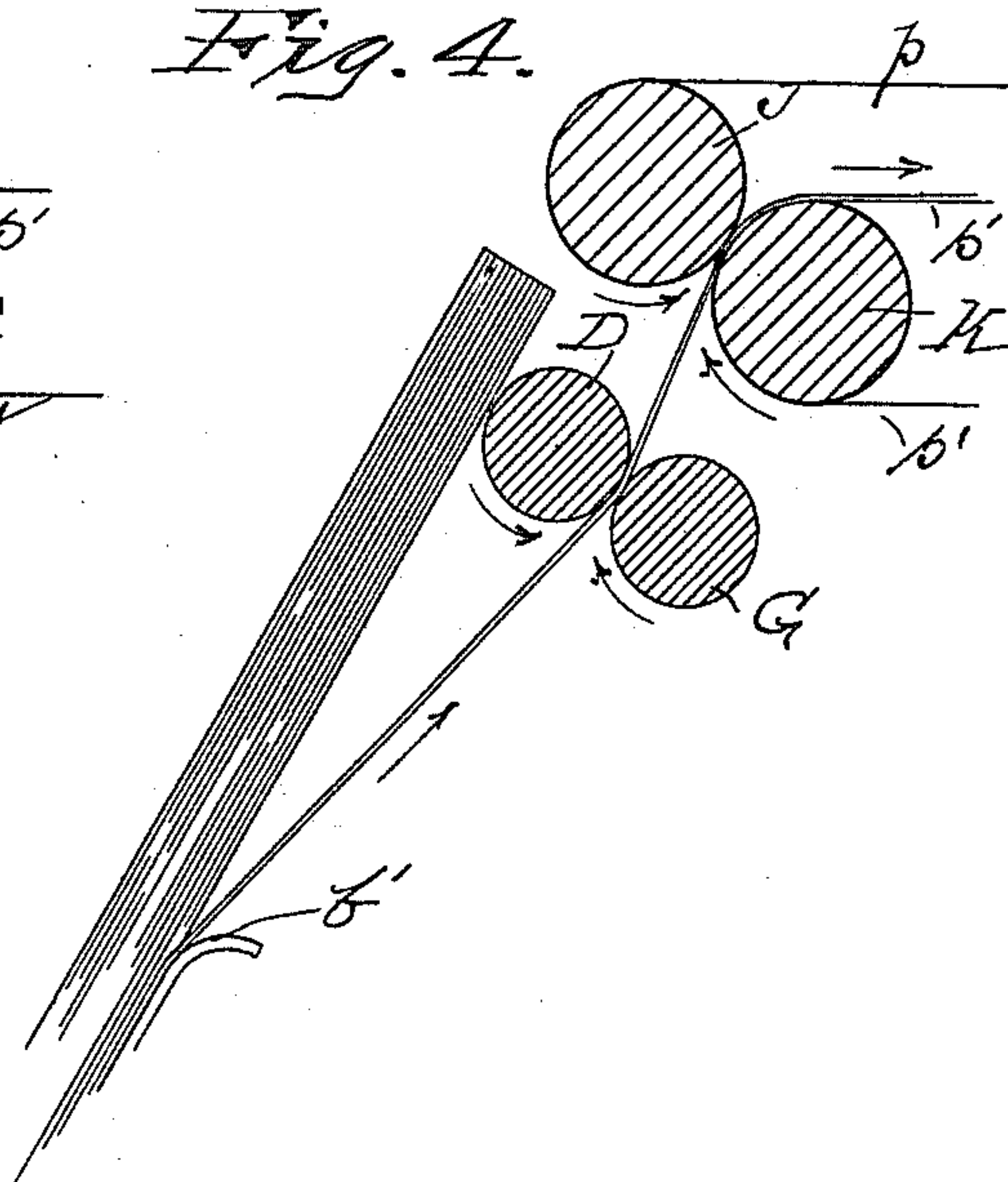


Fig. 4.



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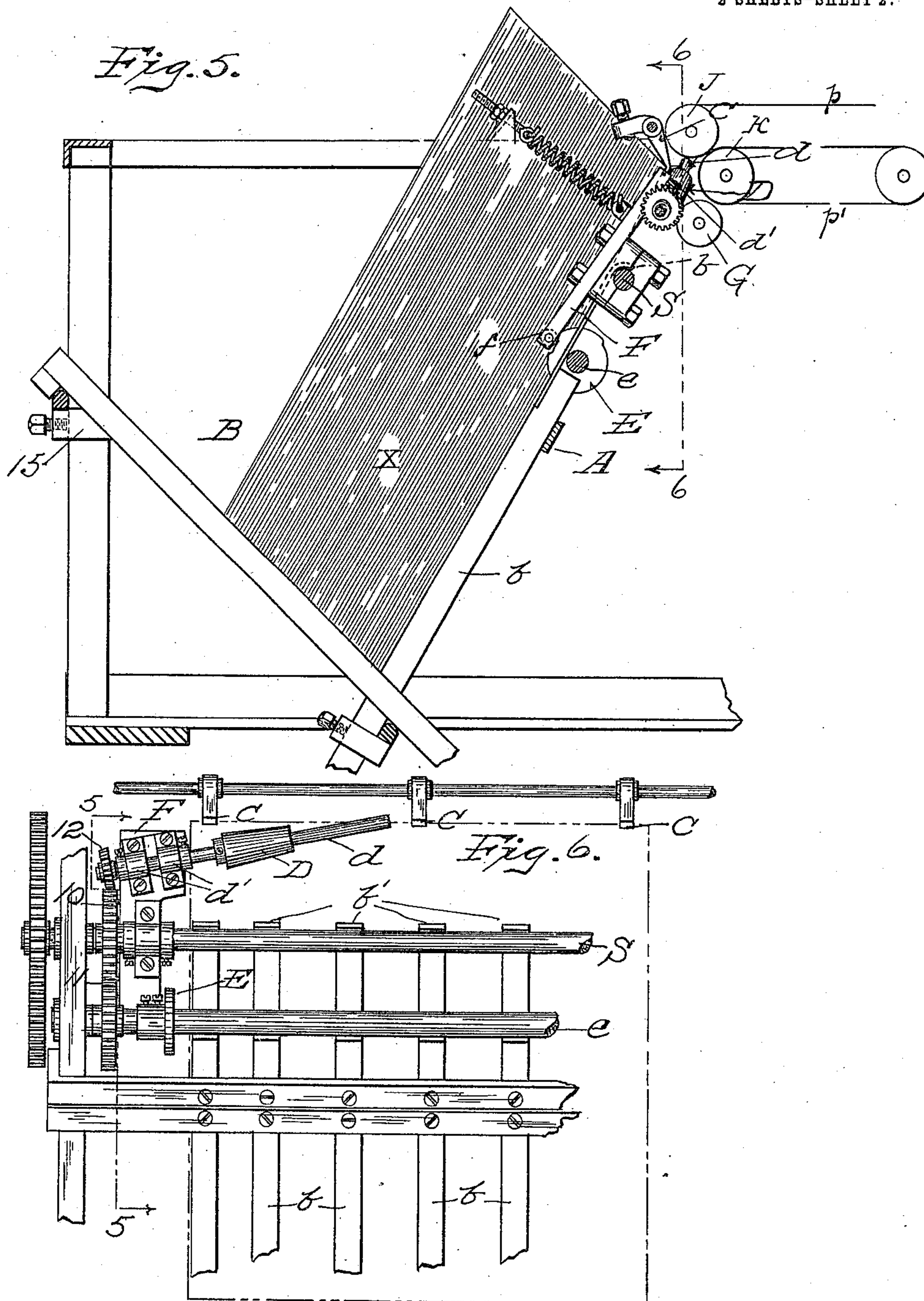
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By his Attorneys
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2 SHEETS—SHEET 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

ANDERS KRAMER, OF HOBOKEN, NEW JERSEY.

SHEET-FEEDING APPARATUS.

985,607.

Specification of Letters Patent.

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Application filed July 29, 1910. Serial No. 574,479.

To all whom it may concern:

Be it known that I, ANDERS KRAMER, a subject of the Emperor of Russia, residing in the city of Hoboken, in the county of Hudson, in the State of New Jersey, have invented certain new and useful Improvements in Sheet-Feeding Apparatus, of which the following is a specification.

The object of my invention is to provide a simple and efficient mechanism for taking sheets one at a time from a pile and feeding the successively separated sheets to a printing press where the individual sheets are to be printed or otherwise treated.

My invention is especially useful in connection with printing presses for feeding covers to the assembled signatures of magazines or pamphlets printed on a web or other press, for instance, and my invention is also useful for feeding sheets to a printing press for the printing of circulars, for example.

In the accompanying drawings Figures 1, 2, 3 and 4 are diagrammatic views to illustrate the mode of operation of my invention; Fig. 5 is a vertical section on the line 5—5, Fig. 6; Fig. 6 is a sectional elevation of one half of the apparatus on the line 6—6, Fig. 5.

The frame of the apparatus is constructed to provide a trough-like receptacle B for the piled-up sheets, the forward sheet resting in an inclined position, against one side of the trough, which is composed of bars *b*, *b*. The upper ends of these bars are preferably curved outwardly at *b*¹, as indicated by dotted lines in Fig. 5, and this outward curve may be over the transverse driving shaft S.

The upper edges of the forward sheets may be held back by adjustable clips C or not, as the character of the paper or occasion may require.

Adjacent to the front face of the forward sheet of the pile, and near the upper edge, and at each side of the apparatus, I provide a friction roller D mounted upon an inclined shaft *d*, (Fig. 6) free to turn in bearings *d*¹ in a movable frame F. This frame in the present instance is pivotally mounted upon the shaft S, (Fig. 5) so as to be free to have a limited oscillating movement thereon, and at its lower end the frame has an antifriction roller *f* bearing upon the periphery of a rotary cam E, upon a countershaft *e*, which may be driven from the shaft S by gears 10 and 11, Fig. 6. A spiral spring R

acting upon each frame F tends to press the roller D toward the sheets of paper. The friction roller shaft *d* may be driven from the same gear 10 by a pinion 12 on the shaft *d*, meshing with said gear, as shown in Fig. 6.

The shaft *d* is preferably parallel with the plane of the forward sheet but inclined with relation to the upper edge of the sheets, as seen in Fig. 6, and in that case I prefer to make the roller D slightly conical as shown in that figure, with the larger end of the cone nearer the side edge of the sheet. By this means the acting edge of the roller is out of parallel with the plane of the sheet to be acted on. The same result may be accomplished in other ways which will readily suggest themselves.

Adjacent to each of the friction rollers D, I mount an idler roller G, in such position that when the lower end of the frame F is acted on by the cam E to throw the upper end outwardly, it will move the roller D up to the roller G.

Extending nearly across the machine just above these pairs of rollers D and G are feed rollers J, K, constantly driven, as indicated by the arrows, at a relatively rapid speed. Over one or both of these feed rollers may be provided an endless apron *p* or *p*¹ to aid in carrying off the successively separated sheets and to deliver them to the point desired.

The operation of the apparatus will be best understood by reference to Figs. 1, 2, 3 and 4, where some of the principal elements are indicated diagrammatically.

The friction roller D is rotated constantly from the main driving shaft, but when its carrying frame F is adjusted, (by the cam E and spring R, or otherwise), to hold the roller D midway between the pile of sheets X and the roller G, as shown in Fig. 1, the roller G will stand idle and the sheets remain undisturbed. If then the frame F be moved by the spring R to bring the roller D to bear against the piled sheets, the action will be to draw the upper corner of the forward sheet downwardly into a loop form, Fig. 2, as is commonly done by the human finger to turn the leaf of a book. The continued rotary motion of the roller D carries the upper corner of the sheet down under the latter, and between it and the adjacent roller G. Then the frame F is shifted by the cam E to bring the roller D up to

the roller G, gripping the sheet between the two, Fig. 3, and causing the sheet to be fed upwardly to the feed rollers F, K, which take the sheet and carry it away to the point
5 where it is needed.

The reason for setting the axes of the two friction rollers D at angles to the upper edge of the sheet, Fig. 6, is that by this means I can spring the central portion of the sheet into frictional engagement with the surface of the friction roller, while it is desirable to have the acting edge of the friction roller D out of parallel with the plane of the sheet, and to have only a part
10 of the roller (the large end of the cone) bear firmly against the sheet, in order to lessen the liability of the roller to act on two sheets, instead of only the forward sheet, this liability being greater with certain
15 kinds of paper of uneven surface.

Means may be provided for adjusting the pressure with which the forward sheet is held against the bars *b*. This may be accomplished by making the lower or rear
25 side *b*¹ of the trough B adjustable. Thus this side *b*¹ may be supported by adjustable sleeves 15, while the bar 16 may be raised or lowered to change the angle of this side *b*¹ with relation to the bars *b*, to accommo-
30 date the receptacle to different sizes of sheets.

It may be added that the carrying of the sheets at an inclination in the trough-like receptacle has also the advantage of rendering the frictional pressure at the bottom of the pile relatively constant as compared with that of a vertical pile, and this renders the adjustment of the friction roller pressure a relatively simple matter and also obviates
35 the necessity for such constant attention as is generally required for vertical piling systems in order to maintain the bottom pressure substantially uniform.

Various modifications of structure which
45 do not depart from my invention will readily suggest themselves, and I do not limit myself to the details shown.

I claim as my invention—

1. In an apparatus for feeding sheets, a
50 receptacle for the piled sheets and means for delivering said sheets in succession, said delivery means comprising a friction lifting roll arranged to bear upon the face of the pile and inclined with relation to both
55 the face and the forward edge of the sheets, and means to rotate said friction roll so that its lower face moves in a direction opposite to the direction of the feed whereby the forward edge of the sheet engaged by the roll is retracted, buckled into engagement with said roll and lifted thereby, for the purpose described.

2. In an apparatus for feeding sheets, a
65 receptacle for the piled sheets and means for delivering said sheets in succession, said

delivery means comprising a friction lifting roll arranged to bear upon the face of the pile at a forward corner thereof and inclined with relation to both the face and the forward edge of the sheets, and means
70 to rotate said friction roll so that its lower face moves in a direction opposite to the direction of the feed whereby the forward edge of the sheet engaged by the roll is retracted, buckled into engagement with said
75 roll and lifted thereby, for the purpose described.

3. In an apparatus for feeding sheets, a receptacle for the piled sheets and means for delivering said sheets in succession, said
80 delivery means comprising a pair of friction lifting rolls arranged at the opposite forward corners of the pile and adapted to bear upon the face thereof, said rolls being inclined with relation to both the face and
85 the forward edge of the sheets, and means to rotate said rolls so that their lower faces move in a direction opposite to the direction of the feed whereby the forward edge of the sheet is retracted, buckled up toward
90 the center into engagement with said rolls and lifted thereby, for the purpose specified.

4. In an apparatus for feeding sheets, a receptacle for the piled sheets and means for delivering said sheets in succession, said de-
95 livery means comprising a friction lifting roll arranged to bear upon the face of the pile and inclined with relation to both the face and the forward edge of the sheets, and means to rotate said friction roll so that its
100 lower face moves in a direction opposite to the direction of the feed whereby the forward edge of the sheet engaged by the roll is retracted, buckled into engagement with said roll and lifted thereby, together with
105 means to bring said roll intermittently into engagement with the face of the pile.

5. In an apparatus for feeding sheets, a receptacle for the piled sheets and means for delivering said sheets in succession, said de-
110 livery means comprising a friction lifting roll arranged to bear upon the face of the pile and inclined with relation to both the face and the forward edge of the sheets, and means to rotate said friction roll so that its
115 lower face moves in a direction opposite to the direction of the feed whereby the forward edge of the sheet engaged by the roll is retracted, buckled into engagement with said roll and lifted thereby, together with a
120 cooperating roll adapted to grip the lifted edge of the sheet and feed it to a conveyer.

6. In an apparatus for feeding sheets, a receptacle for the piled sheets and means for delivering said sheets in succession, said
125 delivery means comprising a coned friction lifting roll arranged to bear at its larger end upon the face of the pile and having its axis inclined with relation to the forward edge of the sheets, and means to rotate said
130

friction roll so that its lower face moves in
a direction opposite to the direction of the
feed whereby the forward edge of the sheet
engaged by the roll is retracted, buckled into
5 engagement with said roll and lifted there-
by, for the purpose described.

In testimony whereof I have signed my

name to this specification, in the presence of
two subscribing witnesses.

ANDERS KRAMER.

Witnesses:

JOSEPH MICHAEL,
WILLIAM ABBE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
