

A. P. ROTH.  
MUSIC SHEET FEED MECHANISM.

APPLICATION FILED MAR. 13, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

FIG. 1.

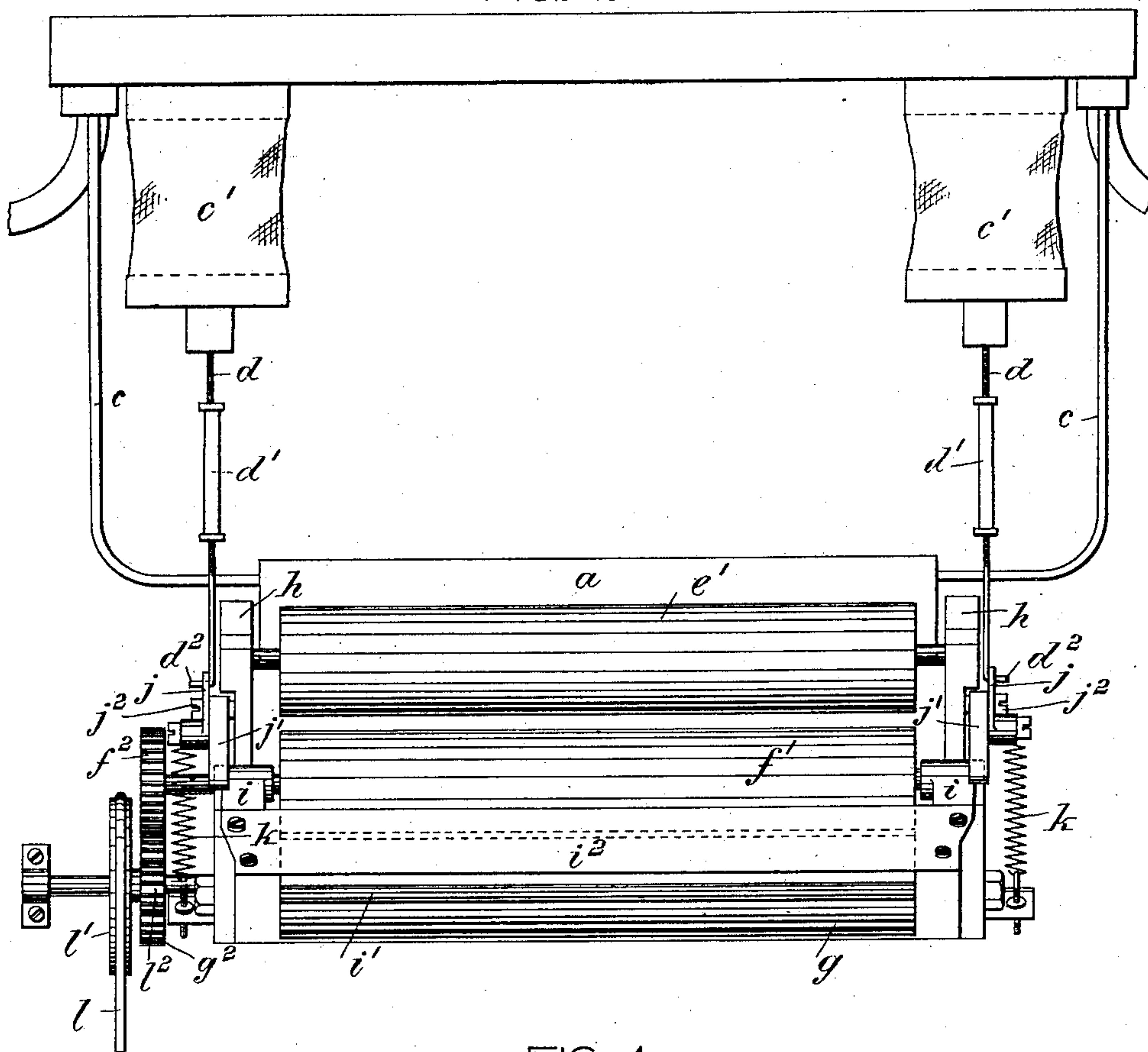


FIG. 4.

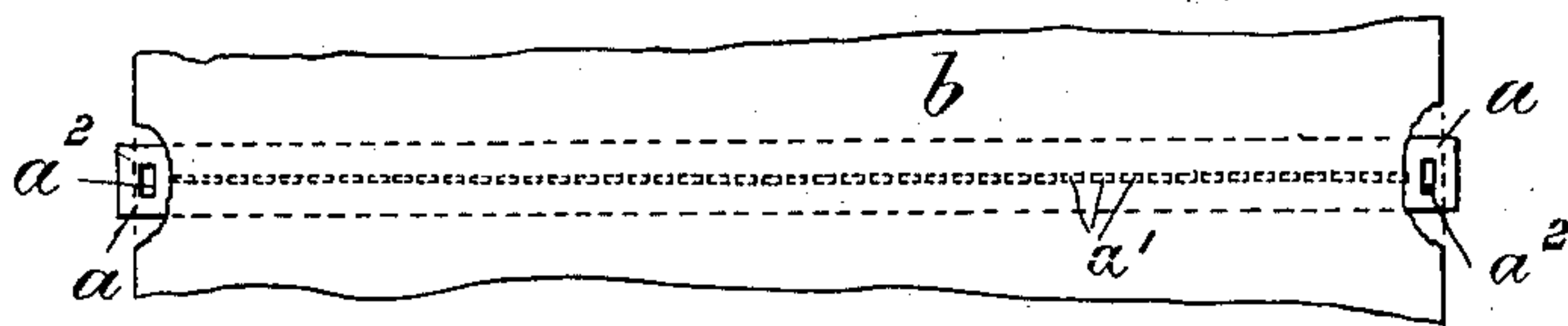
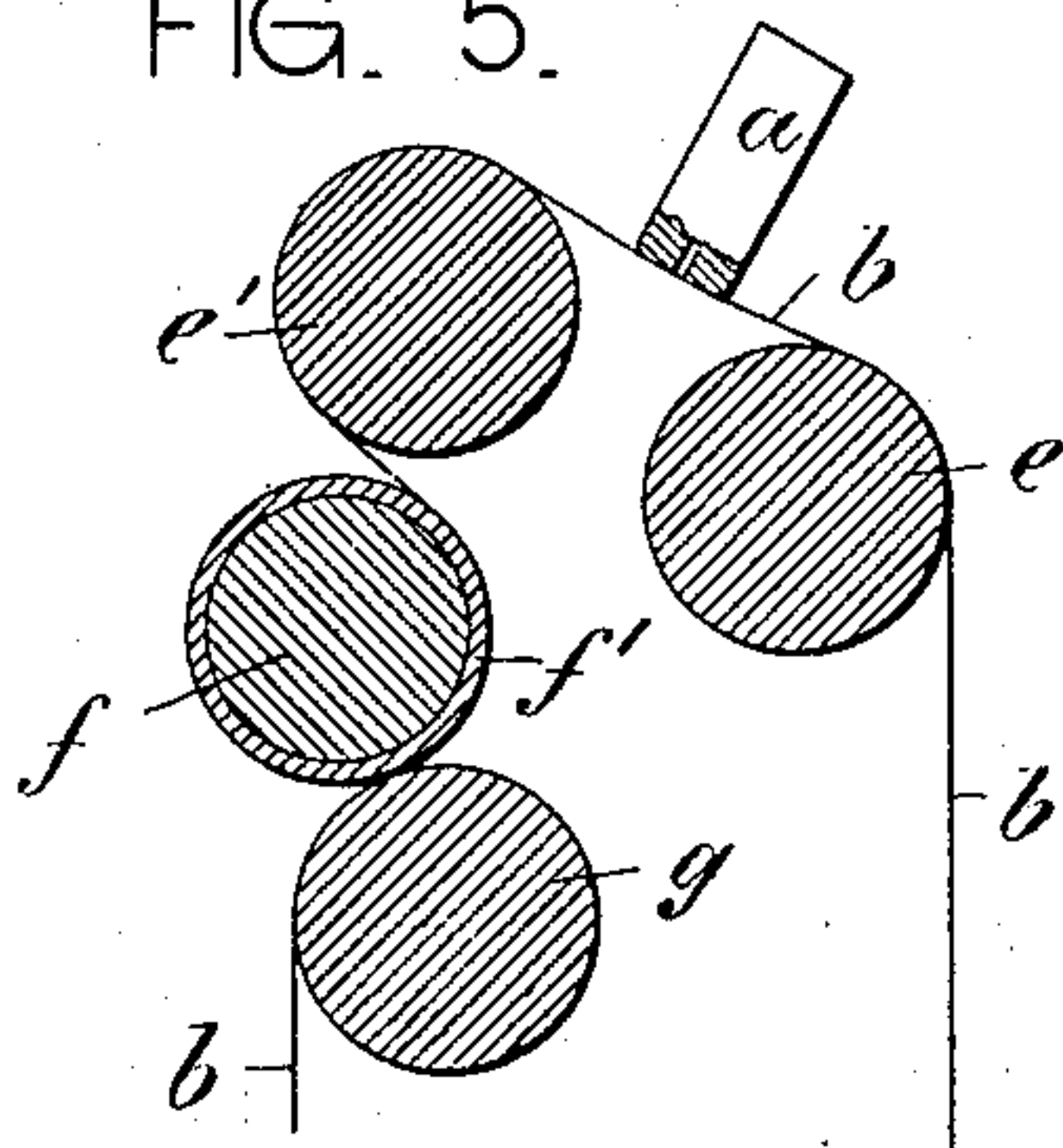


FIG. 5.



Witnesses:  
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William Schulz

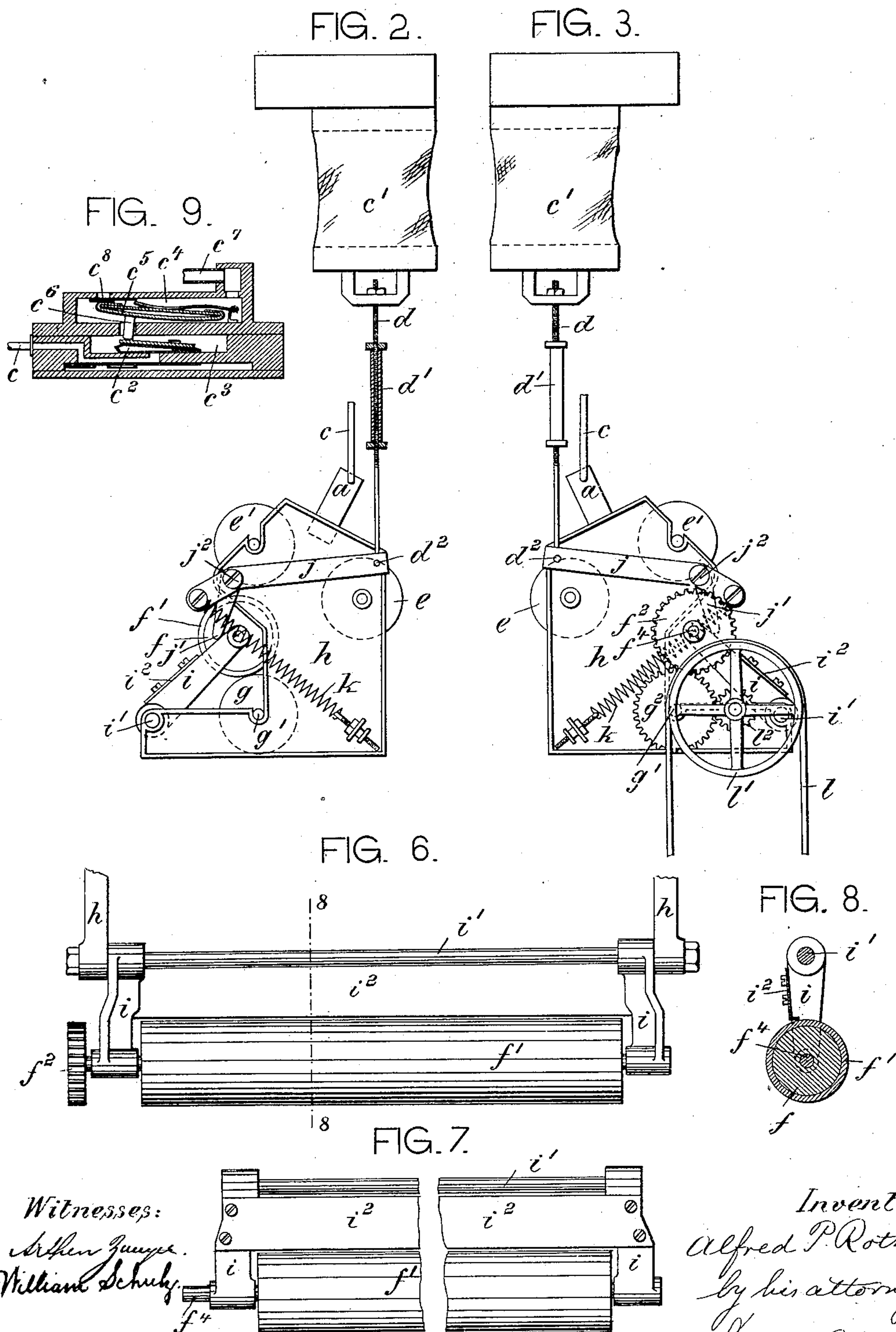
Inventor:  
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Frank B. Brien

A. P. ROTH.  
MUSIC SHEET FEED MECHANISM.

APPLICATION FILED MAR. 13, 1903.

NO MODEL.

2 SHEETS—SHEET 2.



Witnesses:  
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William Schuch

Inventor:  
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Hauke & Brier



# UNITED STATES PATENT OFFICE.

ALFRED P. ROTH, OF NEW YORK, N. Y., ASSIGNOR TO THE FIRM OF ROTH & ENGELHARDT, OF NEW YORK, N. Y.

## MUSIC-SHEET FEED MECHANISM.

SPECIFICATION forming part of Letters Patent No. 741,072, dated October 13, 1903.

Application filed March 13, 1903. Serial No. 147,579. (No model.)

*To all whom it may concern:*

Be it known that I, ALFRED P. ROTH, a citizen of the United States, and a resident of New York city, (Manhattan,) county and State of New York, have invented certain new and useful Improvements in Music-Sheet Feed Mechanism, of which the following is a specification.

This invention relates to a music-sheet feed mechanism for autopneumatic piano-players which is so constructed that the music-sheet will be automatically returned to its normal position at right angles to the duct-bridge whenever it swerves to the right or left. In this way a true engagement between the openings of the duct-bridge and the corresponding perforations of the music-sheet will always be effected, and any defect in the rendering of the music owing to an untrue feed of the music-sheet will be entirely obviated.

In the accompanying drawings, Figure 1 is a front view of my improved music-sheet feed mechanism; Fig. 2, a right-hand end view of Fig. 1, partly in section; Fig. 3, a left-hand end view of Fig. 1; Fig. 4, a detail of the duct-bridge and part of the music-sheet; Fig. 5, a diagram illustrating the run of the music-sheet; Fig. 6, a bottom view of the resilient feed-roller and the adjoining parts, and Fig. 7 a plan thereof; Fig. 8, a cross-section on line 8 8, Fig. 6; and Fig. 9 a detail of the vacuum-chest and bellows.

The letter *a* represents the perforated duct-bridge of an autopneumatic piano-player, from which the air is exhausted in the usual manner. This duct-bridge is provided with the usual perforations or ducts *a'*, adapted to register with corresponding perforations in the music-sheet *b* whenever a note is to be sounded. In addition to the ducts *a'* the bridge *a* is provided near each end with a perforation or duct *a<sup>2</sup>*, which remains constantly covered by the music-sheet as long as the feed of the latter remains true. Each of the ducts *a<sup>2</sup>* communicates by a pipe *c* with bellows *c<sup>2</sup>*, arranged in a chamber *c<sup>3</sup>* of a vacuum-chest, the other chamber *c<sup>4</sup>* of which contains a valve *c<sup>5</sup>*, that has a pin *c<sup>6</sup>*, adapted to bear upon bellows *c<sup>2</sup>*. The chamber *c<sup>4</sup>* communicates with bellows *c'* by a pipe *c<sup>7</sup>*. Thus when air is admitted to duct *a<sup>2</sup>* it will expand bellows *c<sup>2</sup>*,

open valve *c<sup>5</sup>*, and close a vent *c<sup>8</sup>* of chamber *c<sup>4</sup>*. From the vacuum-chamber *c<sup>3</sup>* air is constantly withdrawn by a pump, and thus the opening of the valve *c<sup>5</sup>* will cause a suction in pipe *c<sup>7</sup>*, which will collapse bellows *c'*. When the air is cut off from duct *a<sup>2</sup>* by the music-sheet, the bellows *c<sup>2</sup>* will collapse, the valve *c<sup>5</sup>* will close, and the vent *c<sup>8</sup>* will open to admit air to bellows *c'* and expand the same. This construction of vacuum-chest is well known and does not form part of the present invention.

The bellows *c'* carries a screw-rod *d*, which is connected by an adjustable coupling *d'* with a hook *d<sup>2</sup>*, that influences the music-sheet feed-roller in manner hereinafter described. The coupling *d'* permits the combined lengths of the parts *d d<sup>2</sup>* to be readily adjusted.

The music-sheet *b*, Fig. 5, passes over idler *e*, under duct-bridge *a*, over idler *e'*, and thence between the feed-rollers *f g*, which are rotated in opposite directions to draw the sheet across the duct-bridge. The roller *f* is flexible, it being shown in Figs. 5 and 8 to be covered by a rubber or other resilient jacket *f'*.

The shafts of rollers *e e'* and *g* are hung in fixed bearings of frames *h*, while the shaft *f<sup>4</sup>* of roller *f* is hung in the swinging arms of bearings *i*, turning on a fixed rod *i'* and connected with each other by a yielding plate *i<sup>2</sup>*, Figs. 7 and 8. Each arm *i* is engaged by a toe *j'*, depending from a lever *j*, fulcrumed at *j<sup>2</sup>*. The lever *j* is engaged at one end by the hook *d<sup>2</sup>*, hereinbefore described, while its other end is connected to a spring *k*, which tends to force the toe *j'* against arm *i* and to thus press the feed-roller *f* toward the feed-roller *g*.

The rollers *f* and *g* are positively driven in opposite directions in suitable manner. The drawing Fig. 3 illustrates a cord *l* running over pulley *l'* to rotate shaft *g'* of roller *g* by pinions *l<sup>2</sup> g<sup>2</sup>*, while the pinion *g<sup>2</sup>* engages a pinion *f<sup>2</sup>* fast on shaft *f<sup>4</sup>* of roller *f*.

The operation is as follows: Normally, both ducts *a<sup>2</sup>* being closed by the music-sheet, the roller *f* is pressed uniformly at both ends toward roller *g* by toes *j'*. Whenever the sheet swerves to one side—say to the left—it will open the right duct *a<sup>2</sup>* to collapse right bellows *c'*, and thus draw up the right hook *d<sup>2</sup>*. This hook will tilt the right lever *j*, and



thereby cause the right toe  $j'$  to exert an additional pressure upon the right arm  $i$ . Consequently the right end of the flexible roller  $f$  will be forced toward roller  $g$  and against the intervening music-sheet with a pressure greater than that to which it is subjected at its left end. This excess of pressure will slightly flatten the right end of the roller, and thereby cause the music-sheet to creep toward its right end, and consequently toward the right end of the duct-bridge  $a$ , until the normal rectilinear position of the music-sheet with relation to the duct-bridge has been reestablished. As soon as this readjustment has taken place the right duct  $a^2$  will be closed to expand right bellows  $c'$ , lower the right hook  $d^2$ , and return the right lever  $j$  and toe  $j'$  to their original position. In this way the excess of pressure is removed from the right end of roller  $f$ , and both ends of said roller are again pressed with equal force toward roller  $g$  by the spring-influenced toes  $j'$  until the sheet should again run untrue, when the above-described operation will be repeated.

What I claim is—

1. In a music-sheet feed mechanism, the combination of a duct-bridge having normally closed ducts, with bellows operatively con-

nected therewith, levers operatively connected to the bellows, a feed-roller, a swinging supporting-bearing and means on the levers for exerting a pressure against said bearing, substantially as specified.

2. In a music-sheet feed mechanism, the combination of a duct-bridge having normally closed ducts, with bellows operatively connected therewith, levers operatively connected to the bellows, an oscillating bearing, a feed-roller hung in said bearing, and toes on the levers that engage the bearing at either end of the feed-roller, substantially as specified.

3. In a music-sheet feed mechanism, the combination of a duct-bridge having normally closed ducts, with bellows operatively connected therewith, spring-influenced levers operatively connected with the bellows, an oscillating bearing, a resilient feed-roller hung in said bearing, and toes on the levers that engage the bearing at either end of the feed-roller, substantially as specified.

Signed by me at New York city, (Manhattan,) New York, this 7th day of March, 1903.

ALFRED P. ROTH.

Witnesses:

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F. V. BRIESEN.