No. 867,113. PATENTED SEPT. 24, 1907.

J. W. DARLEY, JR.

SELF PLAYING PIANO.

APPLICATION FILED MAY 23, 1906.

5 SHEETS—SHEET 1.

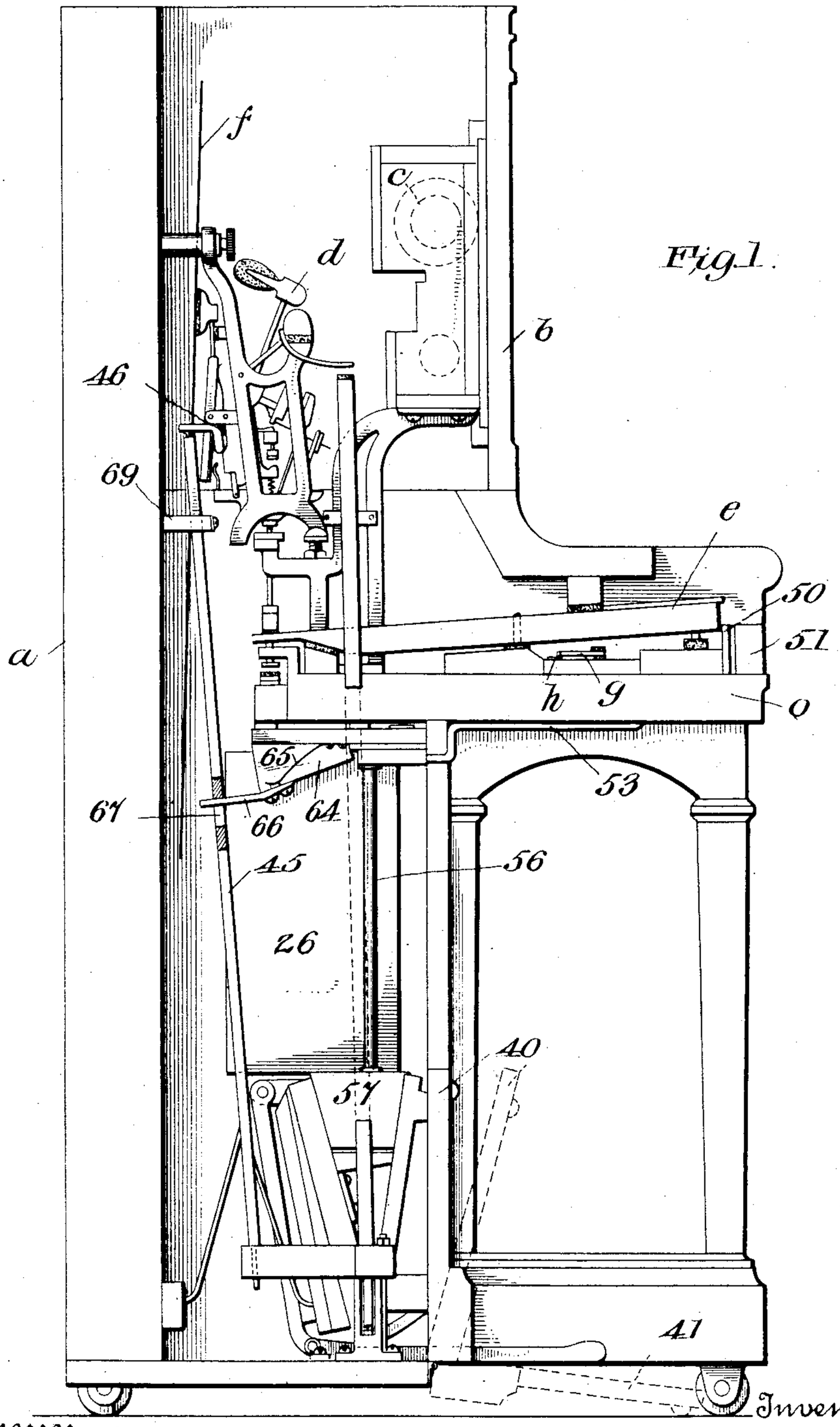

Fig. 1.

Witnesses
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5 SHEETS—SHEET 2.

Fig. 2.

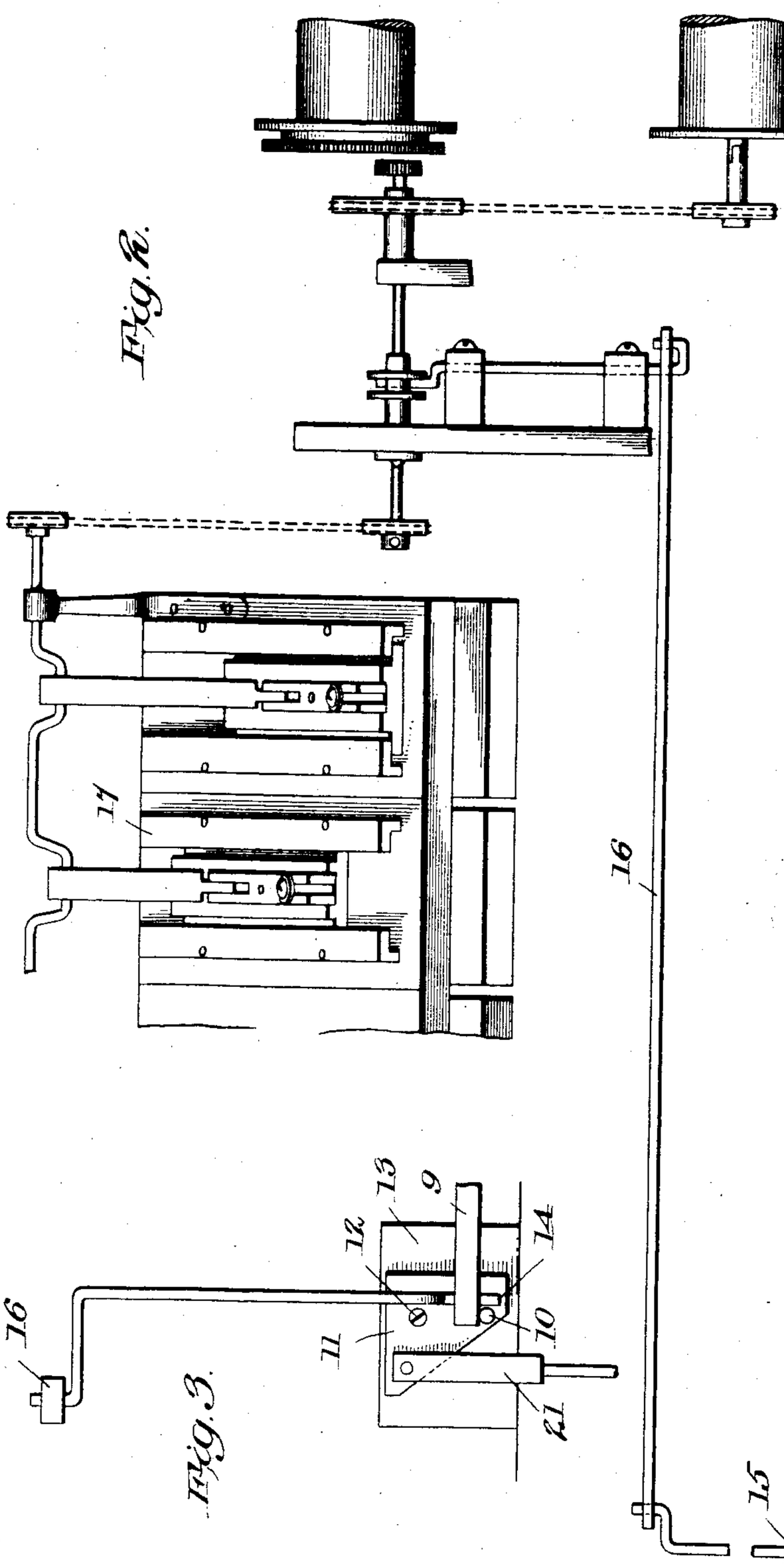
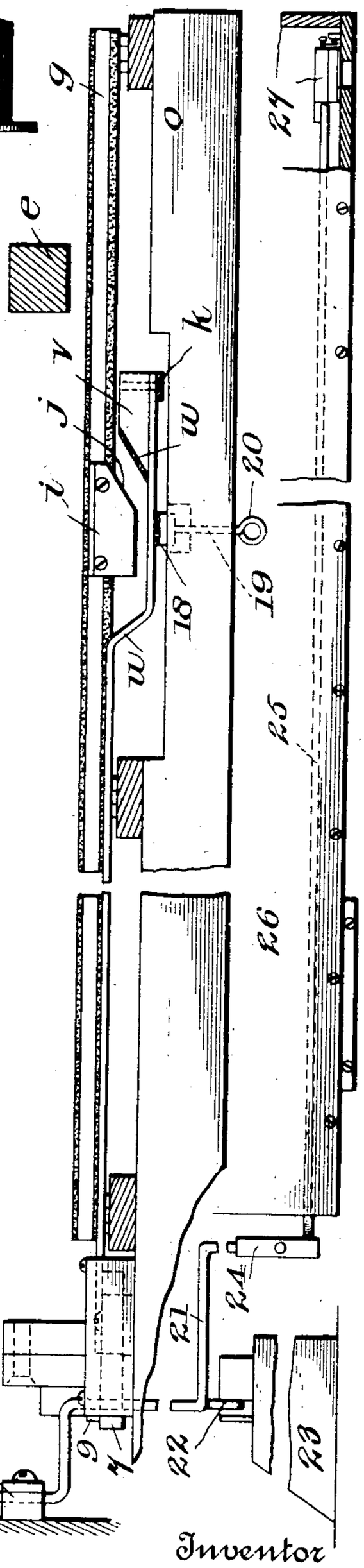


Fig. 3.



Witnesses
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5 SHEETS—SHEET 3.

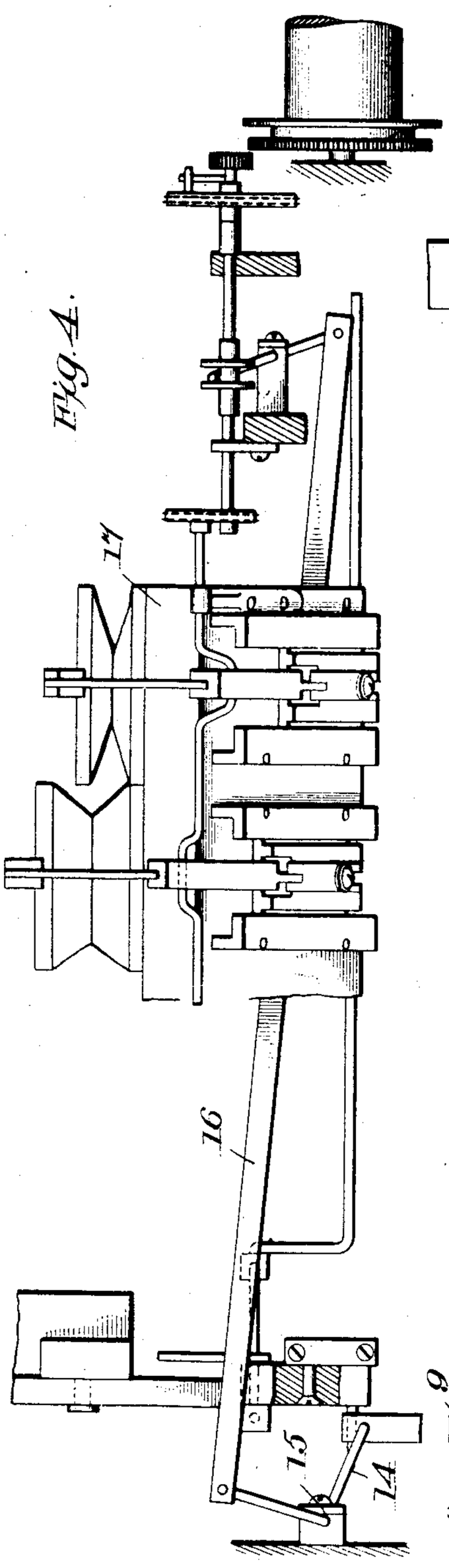

Fig. 4.

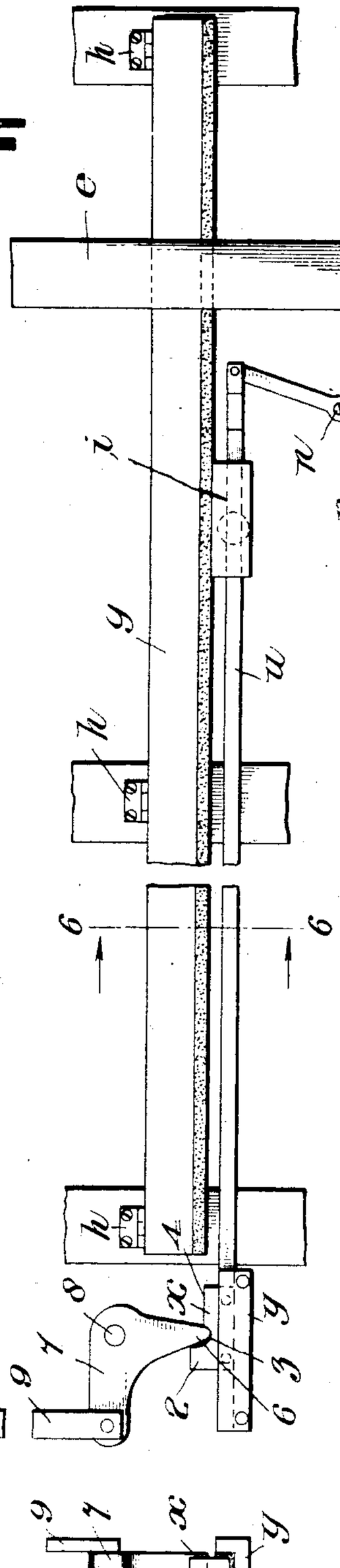

Fig. 4a.

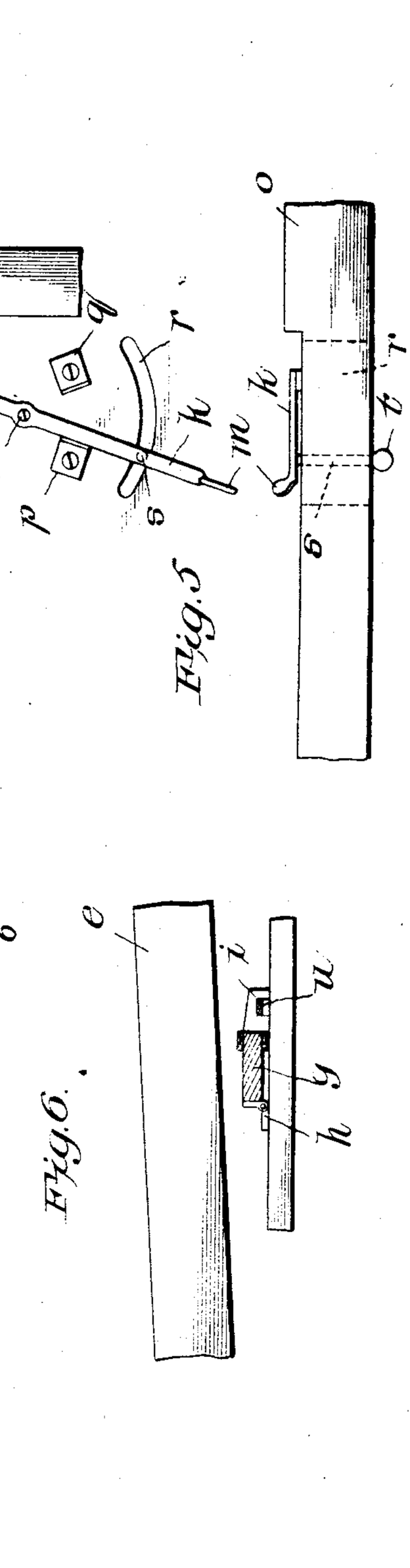

Fig. 5

Fig. 6.

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5 SHEETS—SHEET 4.

Fig. 7.

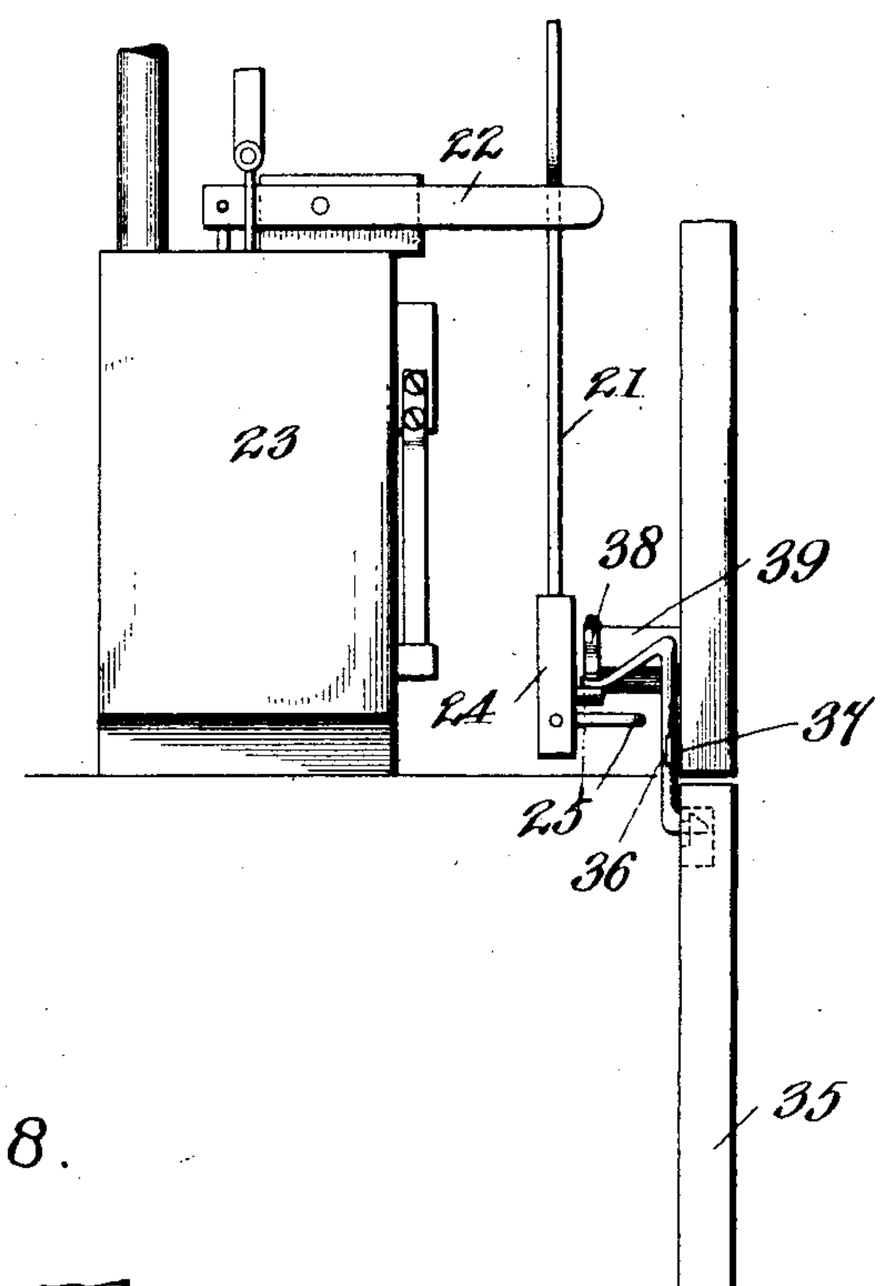
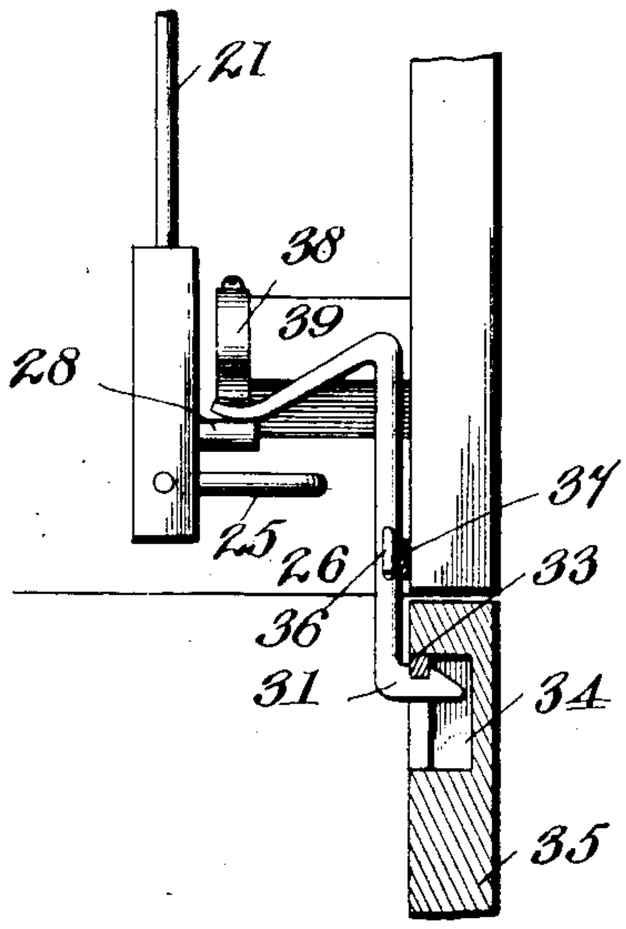


Fig. 8.



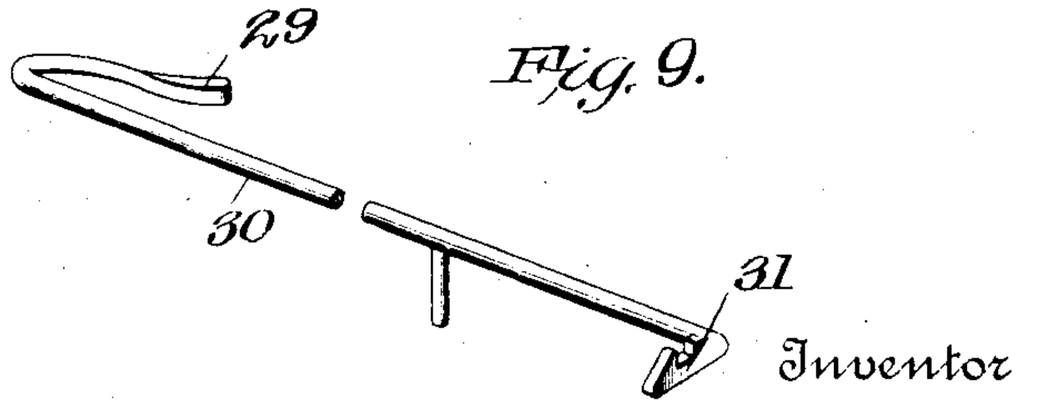


Fig. 9.

Witnesses
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Fig. 10.

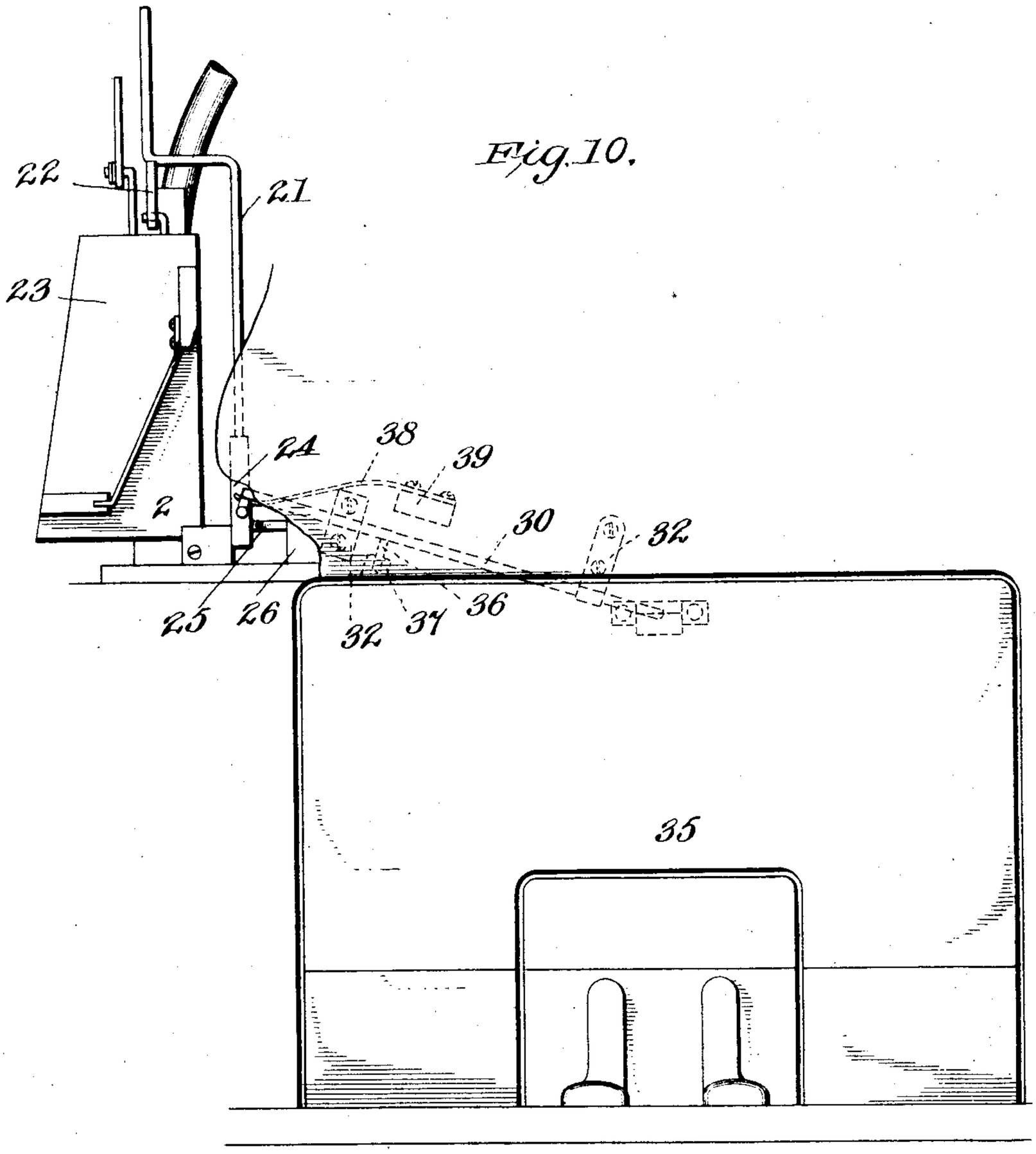
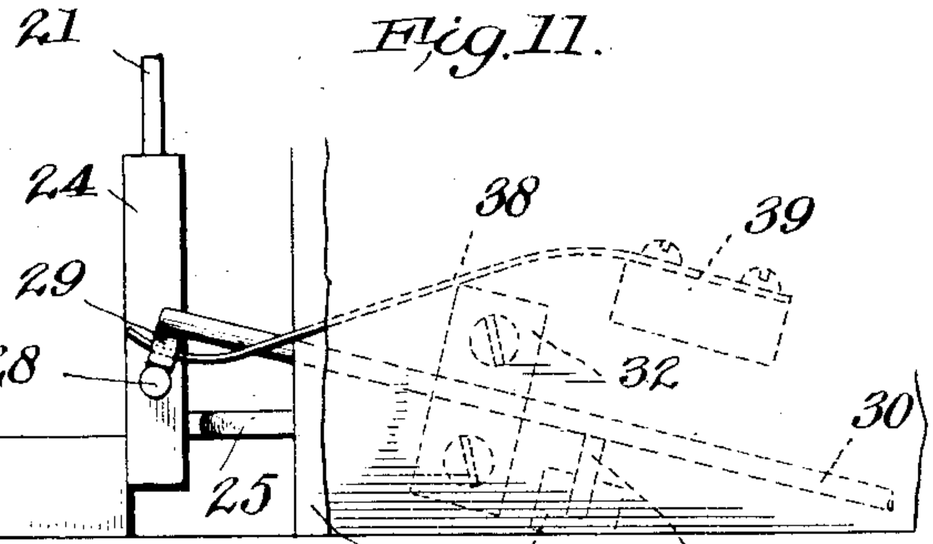


Fig. 11.



Witnesses

Geo. T. Byrne.

Geo. D. Dary

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UNITED STATES PATENT OFFICE.

JOHN W. DARLEY, JR., OF BALTIMORE, MARYLAND.

SELF-PLAYING PIANO.

No. 867,113. Specification of Letters Patent. Patented Sept. 24, 1907.

Application filed May 23, 1906. Serial No. 318,364.

To all whom it may concern:

Be it known that I, JOHN W. DARLEY, Jr., a citizen of the United States, residing at Baltimore city, in the State of Maryland, have invented certain new and useful Improvements in Self-Playing Pianos; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in self-playing pianos, and the object of my invention is to provide an instrument of this class, in which the keys will always be unlocked while the rerolling is taking place, so that the operator may manually play while the rerolling operation is going on, and in which the keys may be either unlocked or locked at will while playing the music by the roll so that the operator may leave the keys unlocked and play manually while the piano is being played mechanically, or so that a single operator may play a four handed piece.

Further objects of the invention are to unlock the pedal board by the action of the rerolling lever when it is moved to the playing position.

With these objects in view my invention consists in the construction and combinations of parts as hereinafter described and claimed.

In the accompanying drawings; Figure 1 is a side view of a complete piano involving my invention with the left hand side thereof removed. Fig. 2 is a fragmentary front view showing one of the keys in section, and the rerolling connections, and the parts in operative connection therewith. Fig. 3 is a detail side view showing the triangular bell crank lever and its connections. Fig. 4 is a fragmentary top plan view showing the operating lever for the rerolling mechanism, and its connections with said mechanism. Fig. 4ª is a view looking in the same direction as in Fig. 1, and showing the guide for the link attached to the rerolling lever. Figs. 5 and 6 represent details of some of the parts shown in Fig. 4. Fig. 7 is a side view of the motor governor and parts connected therewith, also showing means for locking the pedal board. Fig. 8 is an enlarged view of some of the parts in Fig. 7. Fig. 9 is a perspective view of the locking bar for the pedal board. Fig. 10 is a face view of a part of the lower front panel of the piano showing the motor governor, the pedal board, and connections for unlocking the pedal board, and Fig. 11 is a similar view, on an enlarged scale, of parts shown in Fig. 10.

a represents the back of a piano, *b* the front upper panel, *c* the spool frame, *d* the piano action, *e* the key for operating the same, and *f* the string, all these parts being of the usual construction. These parts and other various connections will not, therefore, be further described.

Lying underneath the keys *e* is the rail *g* having strips of felt above and below on its front edge, and hinged at *h* to the batons of the key frame, so that the felted edge may be moved up or down at will. This rail is shown in front elevation in Fig. 2. Attached to the rail *g* is a downwardly projecting block *i*, Fig. 2, one side of which is beveled off, as shown at *j*.

k represents the rerolling lever provided with a handle *m* projecting out in front of the key slip, but not shown in Fig. 1. This lever is pivoted at *n* on a pin in the key bottom *o*. The movement of the lever *k* is limited by the blocks *p* and *q* secured to the key bottom. A curved slot *r* is provided in the key bottom, and a pin *s* is attached to said lever *k* projecting down through said key bottom and terminating in a rounded head or handle *t*. The purpose of this projecting pin is that the lever *k* may be operated without opening the piano, in case the rerolling lever should have inadvertently been left in such a position as to lock the keys when last playing the instrument.

To the inner end of the rerolling lever *k* is attached a link *u* adapted to be slid back and forth by the movement of said rerolling lever. This link is provided near one end thereof with a block *v* having an inclined face *w* adapted to engage the inclined face *j* of the block *i* on the rail *g*. It is evident that a movement of the link *u*, which is bent, as shown in Fig. 2, in order to provide clearance around the block *i*, to the left will lift the block *i* and bring the rail *g* into contact with the under side of the keys *e*. To the opposite end of the link *u* is attached a slider *x*, which runs in a guide *y* carried by the key bottom. This guide *y* is provided with a lining of felt or similar material, so as to diminish noise and enable the slider to move easily, and for the same reason the top of the key bottom is provided with a layer of felt 1 underneath said slider. This slider is provided with an enlarged end 2, a groove 3, and a face 4. In the groove 5 is located the pointed end 6 of a cam 7, which is pivoted on a pin 8 on the key bottom. It is evident that a movement of the link *u* to the left, from the position shown in Fig. 4, will move the point 6 of the cam to the left until said point rides up upon the face 4, after which the further movement of the link *u* to the left will have no effect upon the cam 7, the point 6 thereon simply sliding along the face 4. To the other end of the cam 7 is pivoted a link 9, the rear end of which rests upon a pin 10 in a triangular bell crank lever 11, which is pivoted on a screw 12 to a block 13 screwed to the key bottom *o*. Through a hole in the rear end of the link 9 passes the lower end of a bent rod 14, which is supported in two brackets 15, only one of which is shown, attached to the piano frame. The lever or rod 14 is bent, as shown in Fig. 4, making it a bell crank lever, and to its other end is attached a long link 16 for operating the shifting mechanism to bring the rerolling mechanism, or the playing mechanism, of the paper spools into operation, as desired. All of this construction is shown

in my former patent, No. 838,501, dated December 11, 1906, and need not be further described here, as it is not made the subject of a specific claim. The roll playing and rerolling mechanism are driven by the motor 17 in the usual way.

After the parts are assembled, it is sometimes desirable to adjust the height of the block *v* on the link *u*, after the latter has been placed in position, and for this purpose I provide a button 18 faced with felt or similar material, which may be adjusted up and down by means of a screw 19 provided with a head 20, by which it may be turned. This adjustment may be made from the outside by passing the hand under the key bottom.

In the position of the rerolling lever *k*, as shown in Fig. 4, the keys are unlocked, inasmuch as the blocks *i* and *v* are out of contact with each other, and the various parts for operating the piano pneumatically are in the rerolling position. If the lever *k* be shifted from the position shown in Fig. 4 until it is half way between the stops *p* and *q*, the inclined faces of the blocks *i* and *v* are just touching each other, but the rail *g* will not be lifted, and the keys *e* will still be unlocked. This movement while leaving the keys unlocked will, by the actions described, adjust the pneumatic devices so that the piano can be played pneumatically and by hand at the same time. A still further movement of the lever *k* to the right, until it strikes the stop *q*, will lock the keys by reason of the inclined face *w* of the block *v* coming in contact with the inclined face *j* of the block *i* and lifting the rail *g*, which movement continues until the horizontal parts of the blocks *i* and *v* come in contact with each other, when the rail *g* will be locked in its upper position.

In the position of the lever *k*, as shown in the drawings, the keys are unlocked, the pneumatic mechanism and mechanical connections are set for rerolling, and the pedal board is locked, as shown in Figs. 7 and 10. When the lever *k* is shifted to its mid position, the pneumatic devices and mechanical connections are shifted from the rerolling position to the playing position, the keys still being left unlocked. This shifting movement also unlocks the pedal board, as will now be described.

The movement of the link *u* to the left carries with it the slider *x*, moving the point 6 of the cam 7 to the left and forcing the link 9 backwards. This backward movement of the link 9 carries with it one part of the rod 14 engaging therewith, and the lower part of the rod 14 being in contact with the pin 10 moves the triangular bell crank lever 11 on its pivot 12, and lifts the link 21, which is bent, the bent portion engaging the end of a lever 22, which runs into the governor 23 regulating the pneumatic action thereof. The lower part of the link 21 terminates in a block 24, and in this block is journaled one end of a cranked rod 25, which runs along the bottom of the pneumatic box 26, being secured therein by suitable bearings or clips, not shown. The other end of the rod 25 is bent and engages the valve 27, so that the upward movement of the link 21 will lift said valve 27, thus placing the pneumatic box in communication with the pumpers through the air trunk 57 and allowing a partial vacuum to be created in the pneumatic box by the pumpers. The link 21 moves upwardly when the lever *k* is moved to the playing position; when the lever *k* is moved to the re-rolling position, the link 21 moves downwardly and a spring (not shown) causes the valve 27 to seat itself, thus terminating the flow of air from the pneumatic box to the pumpers, and preventing the operation of the mechanism contained in the pneumatic box during the operation of re-rolling.

The means for unlocking the pedal board will next be described. To the block 24 is attached a projecting pin 28, which is adapted to engage the projecting end 29 of the unlocking rod 30. This rod terminates in a hooked end 31, the whole rod being shown in perspective in Fig. 9. This rod is shown in dotted lines in Fig. 10, being carried in bearings 32 on the lower front panel of the piano. The hooked end 31 of the rod 30 is adapted to engage a slotted plate 33, which plate is inserted in a cut-away portion 34 of the pedal board 35, which is hinged, as shown at 36[a], to the lower part of the piano.

To limit the rotary movement of the rod 30, a pin 36 is attached thereto, said pin being driven into a hole drilled in said rod, which pin is adapted, as the rod rotates, to strike against a cushion 37, thus limiting the rotary movement of said rod 30 in one direction. To force the end 29 of the rod 30 down into proximity with the pin 28, the spring 38 is provided fastened to a block 39 on the lower front panel of the piano.

It is obvious from the connections described that a rotary movement of the rod 30 will disengage its hooked end 31 from the plate 33, allowing the pedal board 35 to be rapidly forced outwards for a short distance, as shown by the dotted lines 40 in Fig. 1, and then allowed to slowly drop into the position shown by the dotted lines 41 in Fig. 1, by the means described in my Patent, No. 839,557, dated December 25, 1906.

While I have thus described my invention, I wish it to be distinctly understood that I do not limit myself to the exact details shown and described, as these might be varied greatly without departing from the spirit of my invention, the principal objects of which are set forth in the beginning of this specification.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is;—

1. In a self-playing piano, the combination of keys, key locking means, winding means, means for setting said winding means either to unroll or to reroll a sheet of music said key-locking means being connected to the setting means, and actuating means adapted to operate or not to operate said locking means during the unrolling operation at the will of the operator, substantially as described.

2. In a self-playing piano, the combination of keys, means for locking said keys, means for unrolling and rerolling a sheet of music, devices for setting said means either to unroll or to reroll said sheet, and connections whereby the movement of said setting devices will either lock said keys or leave them unlocked at the will of the operator, substantially as described.

3. In a self-playing piano, the combination of keys, a locking rail for said keys, means for unrolling and rerolling a sheet of music, devices for setting said means so as to unroll or reroll said sheet, and movable connections so arranged that the locking rail may be operated or not, to lock the keys at the will of the operator during the operation of unrolling, substantially as described.

4. In a self-playing piano, the combination of keys, a locking rail for said keys, means for unrolling and rerolling a sheet of music, and means for shifting said means from the unrolling to the rerolling position and back again, and devices whereby the shifting of said means will hold the keys unlocked during the rerolling

operation and will hold them either locked or unlocked at the will of the operator during the unrolling operation, substantially as described.

5. In a self-playing piano, the combination of keys, a folding pedal board, means for unrolling and rerolling a sheet of music, devices for shifting said means from the one position to the other, and means whereby the operation of said shifting devices unlocks said pedal board, substantially as described.

6. In a self-playing piano, the combination of keys, a shifting lever locking means for said keys and means for unrolling and rerolling a piece of music, controlled by said shifting lever, a pedal board, means for unlocking the same, and connections whereby the movement of said shifting lever unlocks said pedal board, substantially as described.

7. In a self-playing piano, the combination of keys, locking means therefor, means for unrolling and rerolling a sheet of music, a shifting lever for changing said means from one position into the other, a pedal board, means for locking said pedal board, and means whereby the operation of said lever will unlock said pedal board, and the reverse operation will bring said locking means in position to lock said pedal board when it is swung up, substantially as described.

In testimony whereof, I affix my signature, in presence of two witnesses.

JOHN W. DARLEY, JR.

Witnesses:
HENRY J. SANDLAS,
CHARLES R. BOETTGER.