

No. 628,535.

Patented July 11, 1899.

F. W. HEDGELAND.  
SELF PLAYING DEVICE FOR ORGANS.

(Application filed Dec. 20, 1897.)

(No Model.)

2 Sheets—Sheet 1.

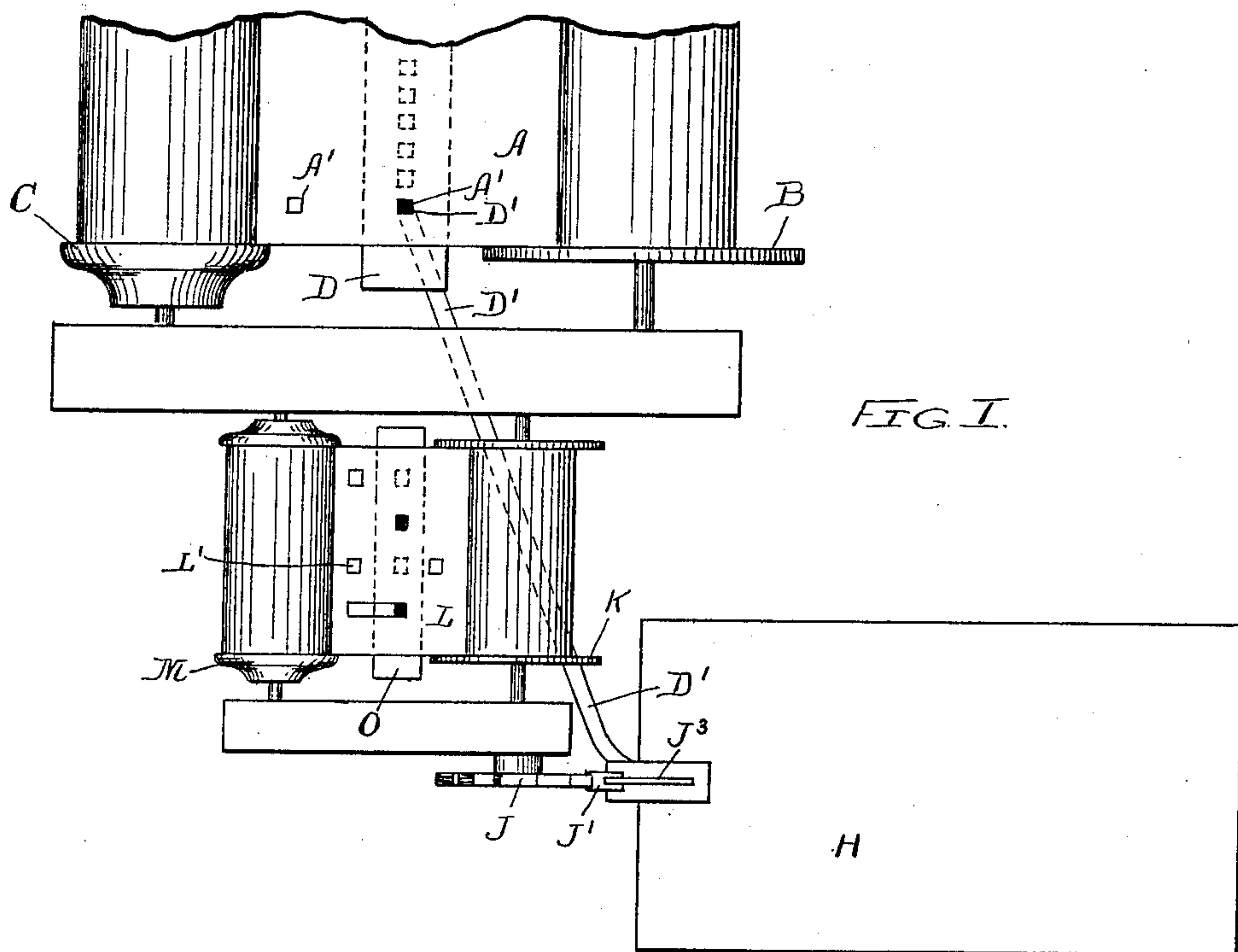


FIG. I.

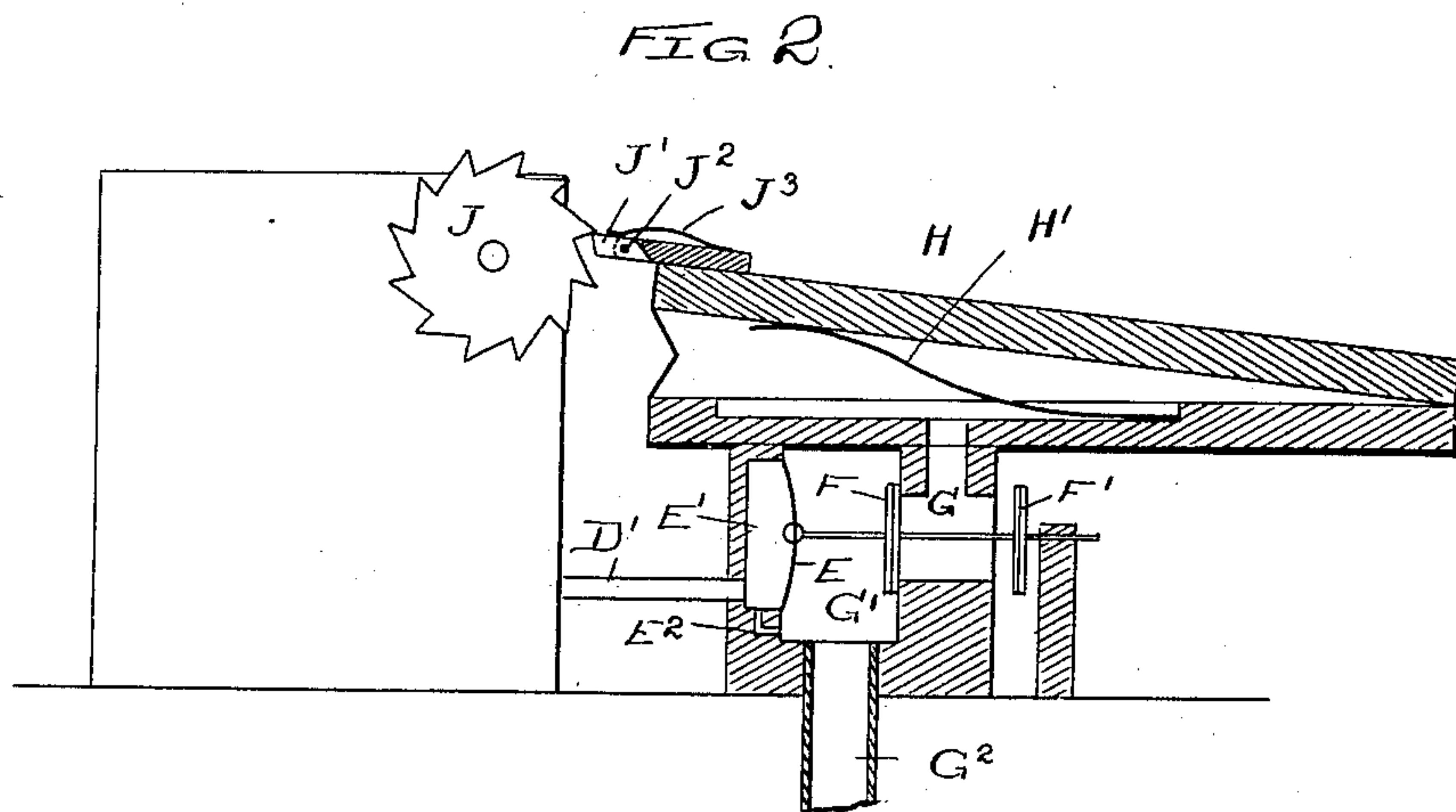


FIG. 2.

WITNESSES:

*Sew. C. Curtis*  
*H. W. Munday*

INVENTOR:  
FREDERICK W. HEDGELAND.

*By Munday, Everts & Adcock,*  
HIS ATTORNEYS.



No. 628,535.

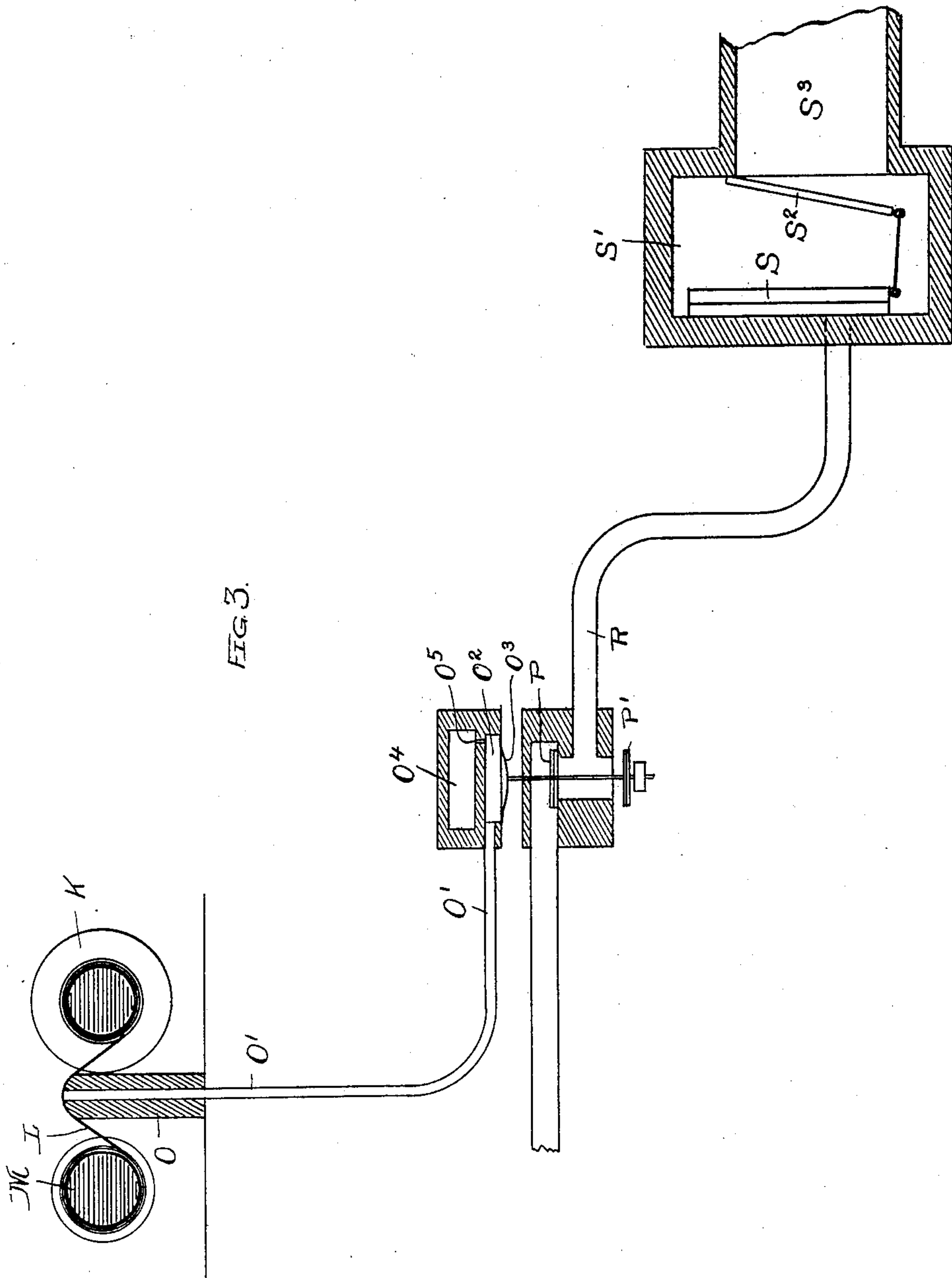
Patented July 11, 1899.

F. W. HEDGELAND.  
SELF PLAYING DEVICE FOR ORGANS.

(Application filed Dec. 20, 1897.)

(No Model.)

2 Sheets—Sheet 2.



WITNESSES:

*Geo. C. Curtis*  
*A. W. Munday*

INVENTOR:  
FREDERICK W. HEDGELAND

BY *Munday, Curtis & Adcock,*

HIS ATTORNEYS.



# UNITED STATES PATENT OFFICE.

FREDERICK W. HEDGELAND, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE  
W. W. KIMBALL COMPANY, OF SAME PLACE.

## SELF-PLAYING DEVICE FOR ORGANS.

SPECIFICATION forming part of Letters Patent No. 628,535, dated July 11, 1899.

Application filed December 20, 1897. Serial No. 662,551. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK W. HEDGELAND, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Self-Playing Devices for Organs, of which the following is a specification.

This invention is intended to provide self-playing instruments with practical means whereby the various stops of the instrument may be operated through the medium of the traveling music-sheet ordinarily employed.

In carrying out my invention I provide the ordinary music-sheet with a line of perforations additional to those customarily embodied therein and the tracker-range with an additional air-passage. The additional perforations are placed longitudinally in the music-sheet at the points where any changes in the registration are desired, and the air-passage is connected to a chamber at one side of a membrane-motor which shifts the controlling-valve of a power-pneumatic and by inflating said membrane causes the pneumatic to act and impart an intermittent movement to a supplemental perforated sheet similar to the main music-sheet, though it may be much reduced therefrom in size, this supplemental sheet being also a valve-sheet and combined with another tracker-range, the openings of which are connected to and control the various stop-actions embodied in the instrument. The supplemental sheet has a separate line of perforations for each stop or combination in the organ and is adapted to throw the stops into and out of action whenever required.

In the accompanying drawings I show at Figure 1 a plan of my invention, and at Fig. 2 a side elevation thereof. Fig. 3 is a section of the connections between the tracker-range and the stop-actions.

In said drawings, A represents the ordinary music-sheet, operated by the rolls B and C in the usual manner and controlling the air-passages in the tracker-range D. The sheet is provided with a line of perforations A' in addition to those usually cut in it, and these perforations pass over the duct D' in the

tracker-range, which is an additional duct to those usually provided in the range. The perforations A' are located on the sheet wherever any change in the registration is desired, and it accomplishes those changes by the aid of the devices now to be described.

Duct D' extends to the chamber E' behind a membrane-motor E, so that when one of the perforations A' passes over the duct air will be admitted to said chamber and inflate said membrane. This operation of the membrane shifts the valves F and F', controlling the passage G, leading from the exhaust-chamber G' to a power-pneumatic H. The chamber G' is connected to the exhaust-bellows of the instrument by pipe G<sup>2</sup>, and is also connected to membrane-chamber E' by the constantly-open small passage E<sup>2</sup>. The pneumatic H is expanded by the incoming air and one or more springs H' and contracted by the exhaust through passage G. When the membrane is inflated by the opening of duct D', it forces said valves to the position indicated at Fig. 2, thereby closing valve F and shutting off the exhaust from the pneumatic, and at the same time it opens valve F', the port of which is open to the outer air and admits air to the pneumatic.

The expanding movement of the pneumatic H acts, through the medium of a pawl J', carried by its moving side, to operate a ratchet-wheel J, which is fast upon the end of take-up roll K, and thereby causes a limited portion of the supplemental valve-sheet L to be wound up on said roll. The supplemental sheet L is normally wound on the supply-roll M. It is perforated with a number of rows of perforations, one row for each stop or combination of stops embodied in the instrument, and the perforations in the several rows are so located as to cause the operating of their respective stop-actions at proper times by admitting air to a supplemental tracker-range O, over which the sheet L is drawn by roll K, and the ducts of which correspond to the rows of perforations in said sheet and lead to and control the various stop-actions, preferably in the manner shown particularly at Fig. 3.

Referring to said Fig. 3, O' is one of the ducts leading from the tracker-range O and



is a type of all the ducts from said range in the manner in which they connect with the stop-actions. Said duct opens into the chamber  $O^2$  of the membrane-motor  $O^3$ , which is joined to and shifts the valves  $P$  and  $P'$ , controlling the compressed-air passage  $R$ , leading from the source of supply of compressed air to the power-pneumatic  $S$ , located in the compressed-air box  $S'$  and having its movable side attached to a valve  $S^2$ , controlling the entrance  $S^3$ , leading to the wind-box of the action. The passage  $R$  serves to inflate that pneumatic when the valve  $P$  is opened and valve  $P'$  closed. The chamber  $O^2$  of the membrane-motor is connected with an exhaust-chamber  $O^4$  by the restricted opening  $O^5$ , adapted to render said membrane neutral when the duct  $O'$  is closed by the valve-sheet  $L$ . The parts are shown in this figure as in the position occupied by them when the stop-action is in service, the duct  $O'$  being in register with an opening in the valve-sheet, so that membrane  $O^3$  is inflated and shuts off the compressed air from the valve-operating pneumatic  $S$ , at the same time allowing said pneumatic to exhaust to the outer air through the port  $P'$ . The collapsing of the pneumatic  $S$  opens the valve  $S^2$  and allows the air from box  $S'$  to escape into the wind-chest of the stop through the port  $S^3$ . When valve  $P$  closes and valve  $P'$  opens, it will be understood that the pneumatic  $S$  collapses under the pressure upon the movable side of the air in box  $S'$ .

The movements of the sheet  $L$  are short and intermittent, and it remains in the position in which it is left at the conclusion of each impulse until another impulse is given it, as the only function devolving upon it is to set the stop-actions in motion and to cut off the air from the tracker-range  $O$ , and thus cause the return of the stop-actions to their normal and non-acting positions, and consequently the sheet needs to be only just long enough to contain the number of perforations required and to secure its proper attachment to rolls  $K$  and  $M$ . Its width will be determined by the number of stops. The ratchet should move it at each impulse just far enough to carry one transverse line of its perforations  $L'$  from the tracker-range and bring another line thereof into register with the range. In cases where a stop already in action is required to be held in action pending changes in other stops then the opening by which it was put in action is elongated as much as necessary to avoid any premature closure of its tracker-duct. It will be understood that when the sheet  $L$  closes the tracker-duct of any stop the action of that stop returns to its normal position of rest.

The power-pneumatic  $H$  of my invention collapses as soon as the main sheet closes the corresponding tracker-duct  $D'$ , the membrane-motor being then rendered neutral by the exhaust-passage  $E^2$ , so that the valves  $F$  and  $F'$  may then shift under the power of the ex-

haust and open the passage  $G$  to the exhaust-chamber. During the collapsing movement the pawl  $J'$  moves into position to engage the succeeding tooth of ratchet  $J$  at the next inflation of pneumatic  $H$ . The pawl, which is pivoted at  $J^2$ , can only yield in one direction and is retained in position by spring  $J^3$ .

I do not herein claim the particular construction of the devices whereby the tracker-range  $O$  is enabled to control the stop-action, nor do I wish to be limited in my claims to the construction shown of those devices, and I furthermore do not wish to be understood as waiving any claim to which I may be entitled to make as the inventor of the means for coupling an exhaust-passage to a compressed-air passage, such as is shown in Fig. 3, as I have since the filing hereof made the same the subject of another application, to wit: Serial No. 663,450, filed December 27, 1897.

I claim—

1. The combination in a self-playing instrument with the main music-sheet and tracker-range, of an intermittently-moving supplemental sheet and tracker-range for controlling the stop-actions of the instrument, substantially as specified.

2. The combination in a self-playing instrument with the main music-sheet and tracker-range, of a supplemental sheet and tracker-range for controlling the stop-actions of the instrument, such supplemental sheet being controlled by the main sheet, substantially as specified.

3. The combination in a self-playing instrument with the main music-sheet and tracker-range, of an intermittently-moving supplemental sheet, and tracker-range for controlling the stop-actions of the instrument, said supplemental sheet being controlled by the main sheet, substantially as specified.

4. The combination in a self-playing instrument, of the main music-sheet, the main tracker-range, an intermittently-moving supplemental sheet, a tracker-range for said supplemental sheet connected to the stop-actions, and means whereby the main sheet controls said supplemental sheet, substantially as specified.

5. The combination in a self-playing instrument, of the main music-sheet, the main tracker-range, an intermittently-moving supplemental sheet, a tracker-range for said supplemental sheet connected to the stop-actions, means for actuating said supplemental sheet, and means whereby the main sheet may control said actuating means, substantially as specified.

6. The combination in a self-playing instrument, of the main music-sheet, a supplemental sheet for governing the registration, and means whereby the main sheet may control the supplemental sheet, substantially as specified.

7. The combination in a self-playing instrument, of the main music-sheet, a supplemental sheet for governing the registration, a



motor for actuating the supplemental sheet, and means whereby the main sheet controls said motor, substantially as specified.

5 8. The combination with the stop-actions of the main music-sheet and a supplemental sheet controlled by the main sheet and acting to control the stop-actions, substantially as specified.

10 9. The combination with the stop-actions of the main music-sheet, the supplemental music-sheet, and the means whereby said supplemental music-sheet controls the stop-actions, substantially as specified.

15 10. The combination with the stop-actions of the main music-sheet, the supplemental

music-sheet, the motor for actuating the supplemental sheet, and devices whereby the supplemental sheet controls the stop-actions, substantially as specified.

11. The combination with the supplemen- 20 tal music-sheet controlling the stop-actions and the main music-sheet of the ratchet, the pawl, the power-pneumatic H, the valves of said pneumatic, and a motor for shifting said valves controlled by the main music-sheet, 25 substantially as specified.

FREDERICK W. HEDGELAND.

Witnesses:

EDW. S. EVARTS,

H. M. MUNDAY.