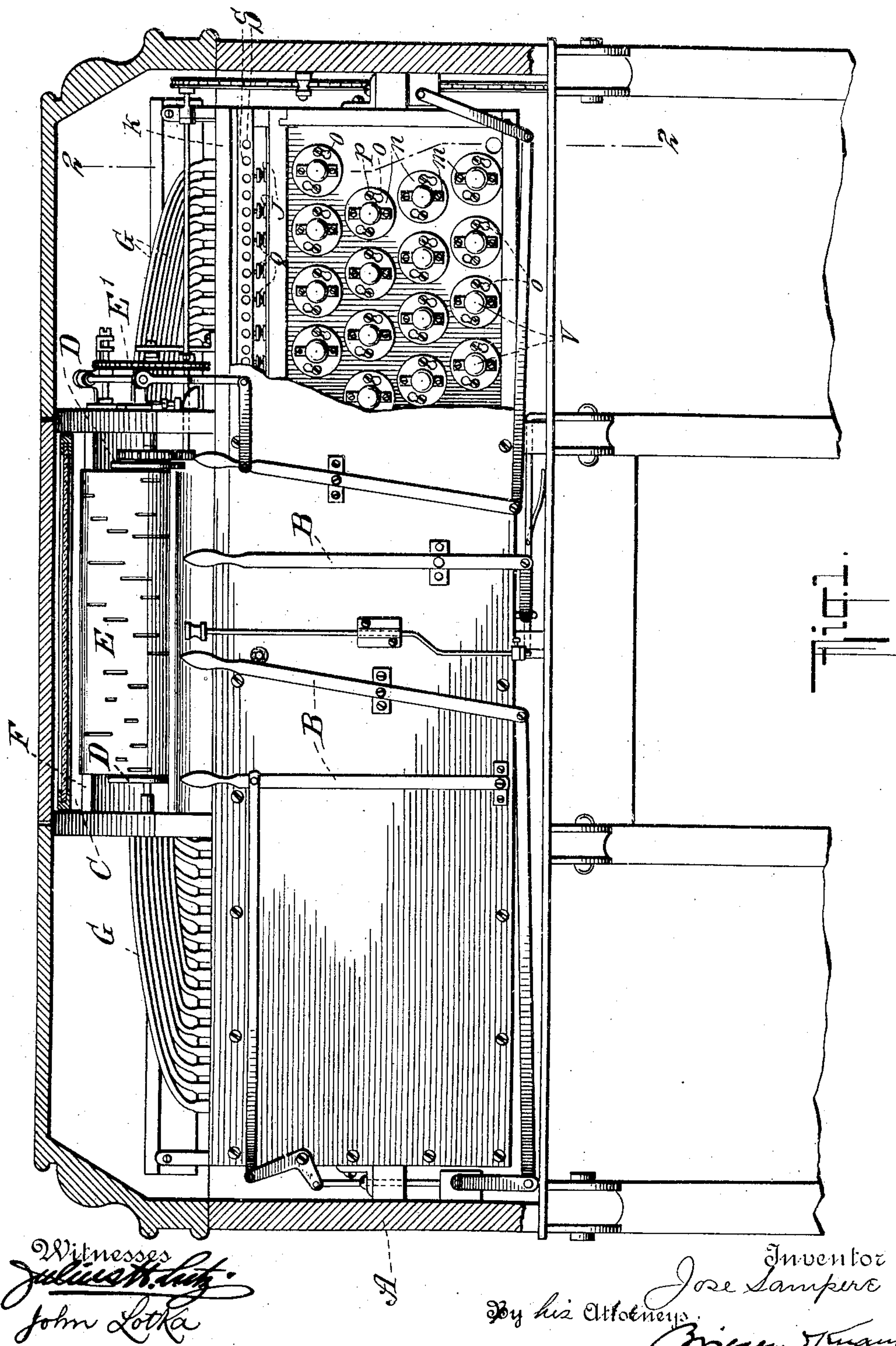


No. 816,605.

PATENTED APR. 3, 1906.

J. SAMPERE.
AUTOMATIC PIANO PLAYER.
APPLICATION FILED MAR. 13, 1905.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

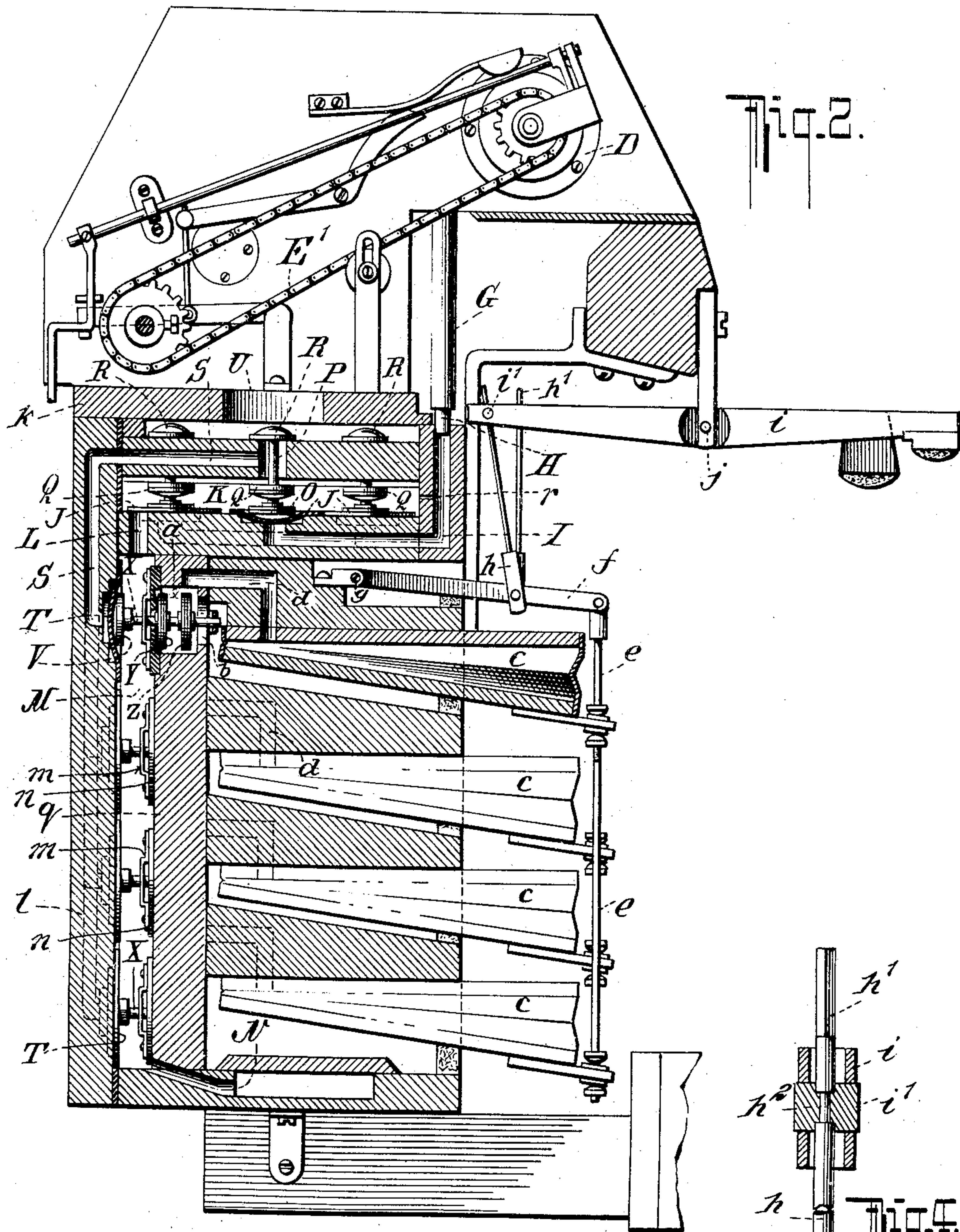


Fig. 2.

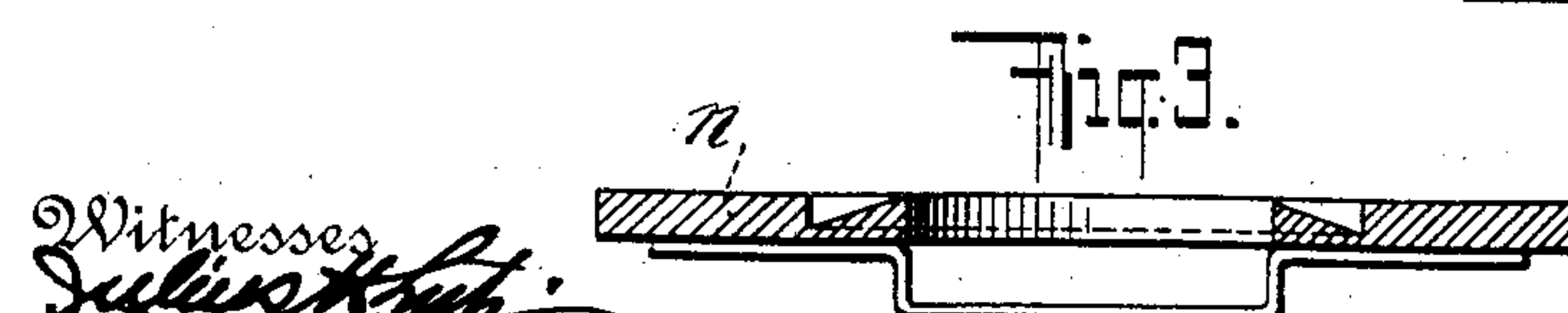


Fig. 3.

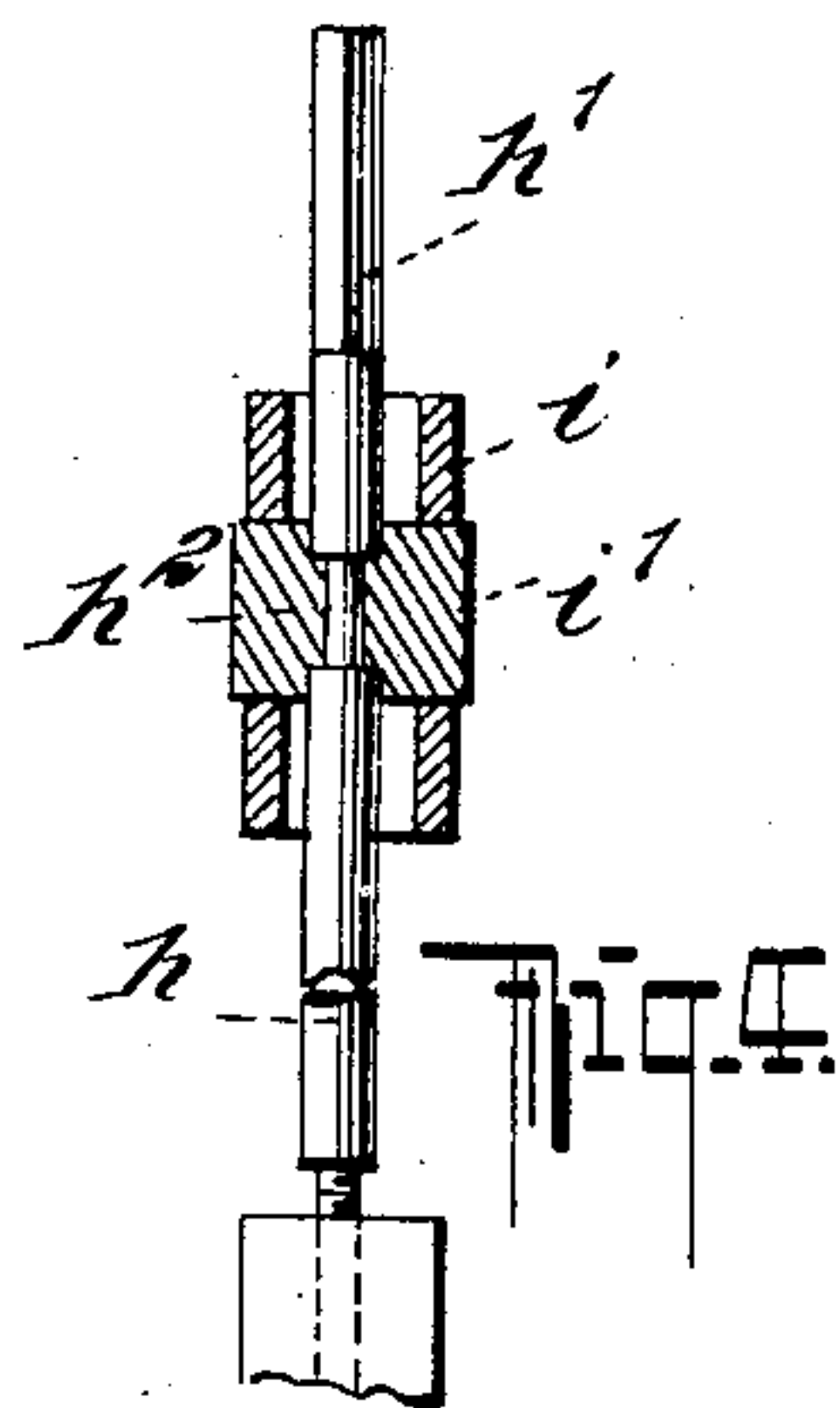


Fig. 4.

Witnesses
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UNITED STATES PATENT OFFICE.

JOSE SAMPERE, OF RAHWAY, NEW JERSEY, ASSIGNOR TO THE REGINA COMPANY, OF RAHWAY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

AUTOMATIC PIANO-PLAYER.

No. 816,605.

Specification of Letters Patent.

Patented April 3, 1906.

Application filed March 13, 1905. Serial No. 249,700.

To all whom it may concern:

Be it known that I, JOSE SAMPERE, a subject of the King of Spain, and a resident of Rahway, Union county, State of New Jersey, have invented certain new and useful Improvements in Automatic Piano-Players, of which the following is a specification.

My invention relates to devices for automatically operating pianos and other musical instruments, and has for its object to provide an improved arrangement of valves in a pneumatic action for the purpose indicated above and also to improve the means for actuating and adjusting the strikers employed in apparatus of this character.

The invention will be fully described hereinafter and the features of novelty pointed out in the appended claims.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is a front elevation of a portion of a piano-player embodying my improvements with parts in section. Fig. 2 is a sectional elevation on line 2 2 of Fig. 1. Fig. 3 is an enlarged detailed view of one of the valve-seats in section, and Fig. 4 is a sectional detail of the striker-adjusting device.

My invention is applicable to a pneumatic action, whether the same be located within a piano or like instrument or in a separate attachment commonly called a "piano-player."

A indicates the frame, at the front of which are arranged various levers and controllers B, which I shall not describe in detail, inasmuch as they perform the usual functions of governing the expression, the speed, and other features or operations. At the upper portion of the frame is located a suitable compartment C, adapted to contain the rolls D for the traveling music-sheet E, which is driven by means of a suitable motor, of which the chain F (shown in Fig. 2) forms a member. Motors for this purpose being well-known in the art, I have not deemed it necessary to illustrate or describe the details thereof. The music-sheet E having the customary perforations passes over a tracker-board F, provided with as many perforations as there are keys to be struck. From each of these perforations a suitable air-channel—formed, for instance, by a tube G—leads to one of a series of nipples H, located at the upper end of channels I. Each of these chan-

nels leads to one side of a diaphragm J, the other side of which is exposed to the suction or reduced pressure existing within a first primary valve-chest K. This valve-chest communicates by a passage L with a second primary valve-chest M, from which a channel N leads to the main wind-chest of the instrument, (not shown,) so that the suction produced by the bellows or equivalent devices commonly employed in instruments of this kind will tend to draw the diaphragm J into the chamber K. Each of the diaphragms J is engaged by a head O, which is connected by a stem P with an inner valve Q and an outer valve R. The inner valve Q, which is normally open, allows the chamber K to communicate with a passage S, leading to the outer side of a diaphragm T, the inner side of which is exposed to the suction within the second primary valve-chest M.

It will be understood that there is a channel S and a diaphragm T for each of the valves Q. As long as a valve Q is open the corresponding diaphragm T will be subject to the same pressure on the inside and outside and will therefore remain in the normal position. (Shown in Fig. 2.) The outer valve R is adapted when open to connect the passage S with the atmosphere through suitable air-inlets, such as U, it being understood that when the valve R opens the valve Q closes. This opening of the valve R is brought about as soon as any one of the apertures of the music-sheet E registers with one of the openings of the tracker-board F. This causes a preponderance of pressure on the outer surface of the diaphragm J where the same faces the channel I and forces the diaphragm inward, so as to close the valve Q and open the valve R. By this operation the channel S is connected with the outside air, and the resulting preponderance of pressure forces the diaphragm T inward. Each diaphragm T engages a head V on a stem X, carrying two valves Y and Z. The valve Y is normally seated by suction, so as to disconnect the second primary wind-chest from a chamber a, which normally communicates with the outside air by means of an aperture b and which permanently communicates with the interior of the corresponding striking-pneumatic c by means of a channel d. The second valve Z is normally open; but upon the inward movement of the diaphragm T the valve Z will

close and the valve Y will open. Thus the interior of the striking-pneumatic *c*, which is normally open to the atmosphere, will be temporarily connected with the second primary wind-chest M, causing the said pneumatic *c* to collapse and operate the corresponding key of the piano or other instrument.

The pneumatic action may be of any desired construction; but I prefer the one shown in Fig. 2, where I employ an abstract *e*, connected with the movable member of the striking-pneumatic and also with a lever *f*, fulcrumed at *g* and connected by a link *h* with a striking-lever *i*, fulcrumed at *j*. The link *h* is connected with the lever *f* between the fulcrum *g* and the point of connection of said lever with the abstract *e*. In order to enable each of the strikers *i* to be adjusted individually, I prefer to make the link *h* in two sections, so as to render it extensible. The two sections, as shown, are connected by screwing one into the other. The upper section has a flat or angular portion *h'*, projecting above the striker *i* and adapted to fit a suitable key used for turning said upper section. The pivot *i'* is formed of leather or similar material to fit a reduced portion *h²* of the link, so that a longitudinal movement of the upper link-section relatively to the pivot is prevented. The links *h* are connected with the strikers *i* by forcing the end *h'* of said links through openings in the pivots *i'*, which openings are smaller in diameter than the links *h*. Thus when the reduced portion *h²* reaches the position shown in Fig. 4 the material of which the pivot *i'* is constructed being elastic will contract and grip said reduced portion *h²* of the links. Other means may be employed for adjusting the length of the links *h*.

It will be understood that by turning the upper link-section this section, together with the corresponding striker, will be adjusted up or down. By providing for the individual adjustment of the strikers I am enabled to secure an absolutely uniform touch for all the keys. The same result might be obtained by making the abstract *e* extensible instead of the link *h*.

In piano-players of the character herein described it is of great practical importance that the valves should be readily accessible for inspection and repairs. For this purpose the top plate *k*, in which the air-inlets *U* are located, is made removable, so that the outer valves R may be readily got at. Furthermore, I employ a removable front wall *l* for the chambers K and M, which wall carries the second primary diaphragms T. Thus the said diaphragms are made readily accessible and at the same time the valves Q and heads O and V. In order to enable the valves Y and Z to be readily taken out, I prefer to guide their stem X in a cross-bar *m*,

secured to a plate *n*, having two keyhole-slots *o*. These slots are adapted to receive screws *p*, secured to the rear wall *q* of the chamber M, it being understood that a slight turning movement of the plate *n* will lock or unlock it, enabling it to be removed with the stem X and the parts carried thereby when desired. I prefer to form this plate *n* with a seat of peculiar formation for the valve Y. As shown in Fig. 3, the inner edge of this seat is practically flush with the rear face of the plate *n*, and the remainder of the valve-seat is beveled, so that the seat is practically part of a conical surface. I have found that with this arrangement the valve will seat much better than if an ordinary flat seat were employed.

In order that the diaphragms J may return to their normal position, (shown in Fig. 2,) as soon as the corresponding hole in the tracker-board is covered, I provide a bleeding-hole *r* in the rear wall of the chamber K, so as to establish a communication between said chamber and each of the channels I. This will restore equal pressures on both sides of the diaphragms J and allow the preponderance of pressure on the outer valve R to close the same. The location of the bleeding-holes *r* in the rear wall of the chamber K is preferred, as it renders the said holes readily accessible after removal of the front wall *l*. A long pin or wire may, for instance, be inserted from the front to clean the said bleeding-holes, if necessary.

Various modifications may be made without departing from the nature of my invention.

I claim as my invention—

1. In a pneumatically-operated musical instrument, a frame having a first primary wind-chest K and a second primary wind-chest M communicating therewith, a removable wall *l* normally closing both of said wind-chests at one side, diaphragms T carried by said wall in the second primary wind-chest and channels S leading from said diaphragms T to the first primary wind-chest, first primary valves R and Q controlling the connection of said channels with the outside air and the first primary wind-chest respectively, pneumatics C and second primary valves Z and Y controlled by said diaphragms to connect the pneumatics either with the outside air or with the second primary wind-chest, diaphragms J in the first primary wind-chest, for controlling the first primary valves, and a tracker-board F having channels G, I, leading to the last-named diaphragms.

2. In a pneumatically-operated musical instrument, pneumatics, a vertically-disposed second primary wind-chest, second primary valves controlling the connection of said pneumatics with either the outside air or the second primary wind-chest, a first pri-

mary wind-chest disposed horizontally above the second primary wind-chest and communicating therewith, channels for controlling the position of the second primary valves from the first primary wind-chest, first primary valves controlling the connection of said channels with either the outside air or the first primary wind-chest and a tracker-board having connections governing the position of the first primary valves.

3. In a pneumatically-operated musical instrument, a wind-chest having a removable wall at one side, primary valves in said wind-chest, a tracker-board having connections for controlling the position of said primary valves, said connections passing along the wall of the wind-chest opposite to the removable wall thereof and being provided with bleeding holes, extending toward said removable wall, a second primary wind-chest below said first-named wind-chest and covered by

said removable wall, and pneumatics, the connection of which with either the outside air or the second wind-chest is controlled primarily by said first primary valves.

4. In a pneumatically-operated musical instrument, a pneumatic, a striker and a mechanical connection between said striker and pneumatic, said connection comprising a link consisting of two sections having a screw connection with each other, one of said sections being rotatably secured in a pivot which is in turn rotatably mounted in the striker.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSE SAMPERE.

Witnesses:

JOHN LOTKA.

JOHN A. KEHLENBECK.