

J. C. BRIGGS.
Reed Organ.

No. 229,369.

Patented June 29, 1880.

Fig. 1.

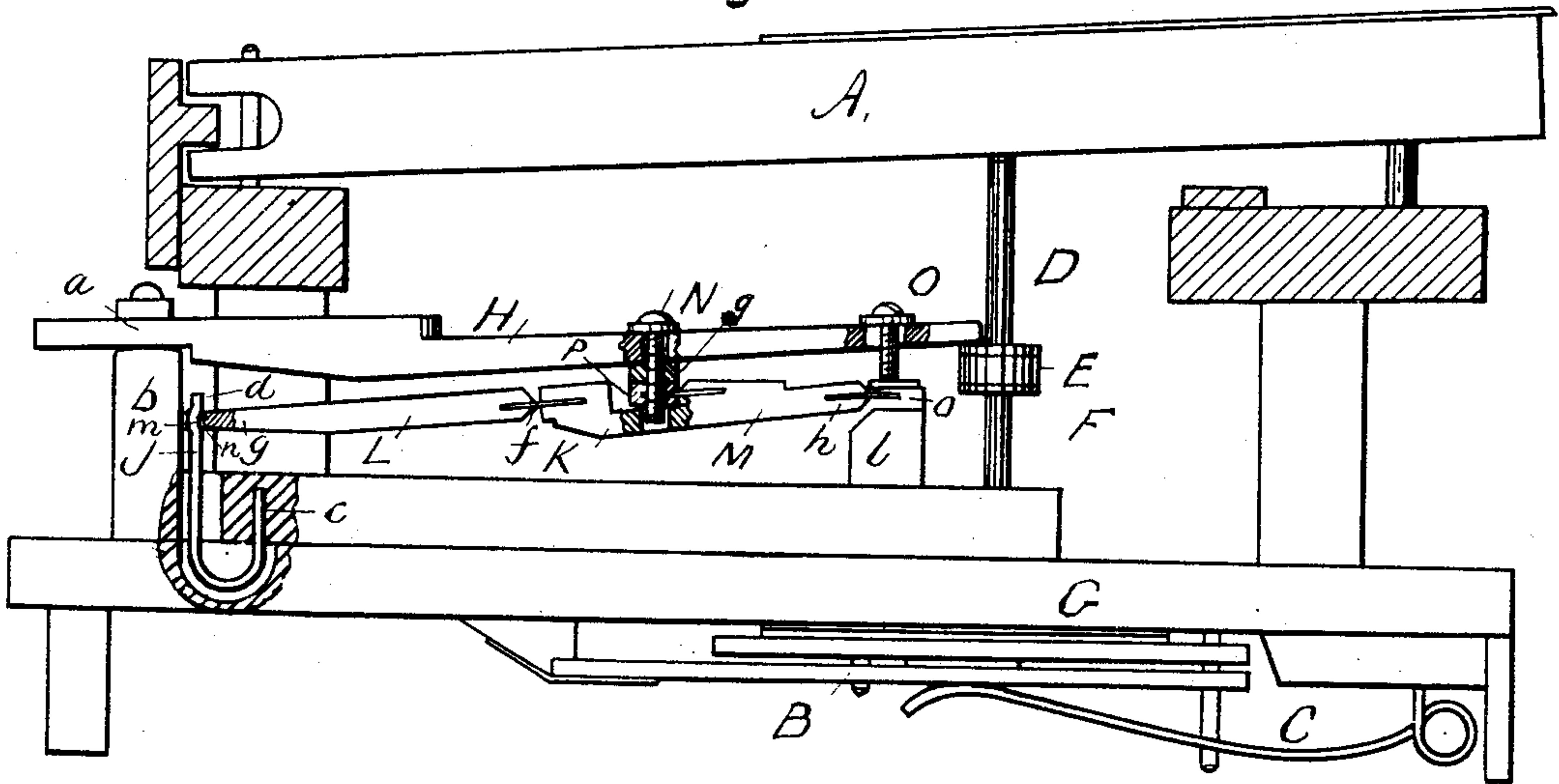
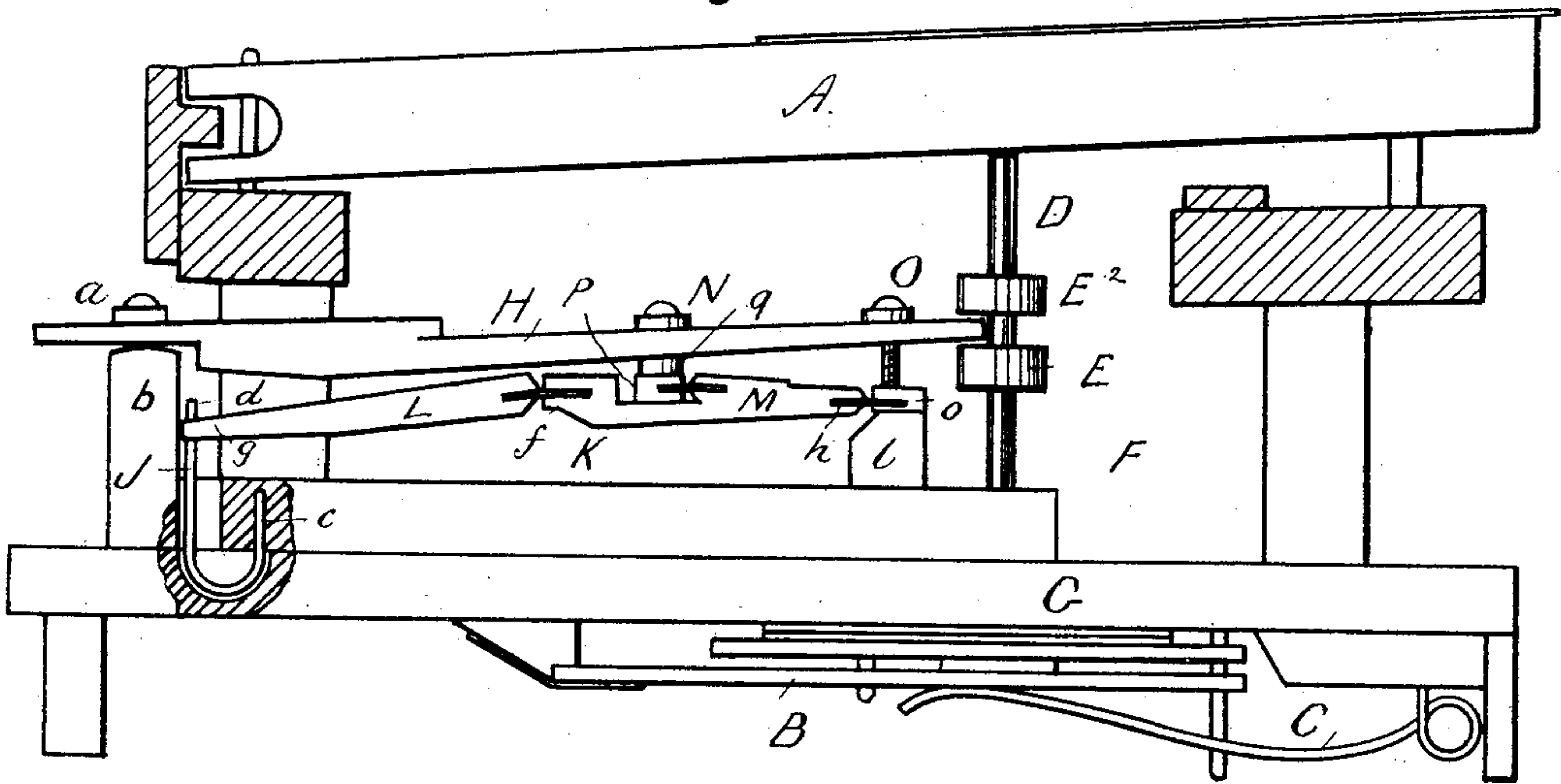


Fig. 4.



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Fig. 2.

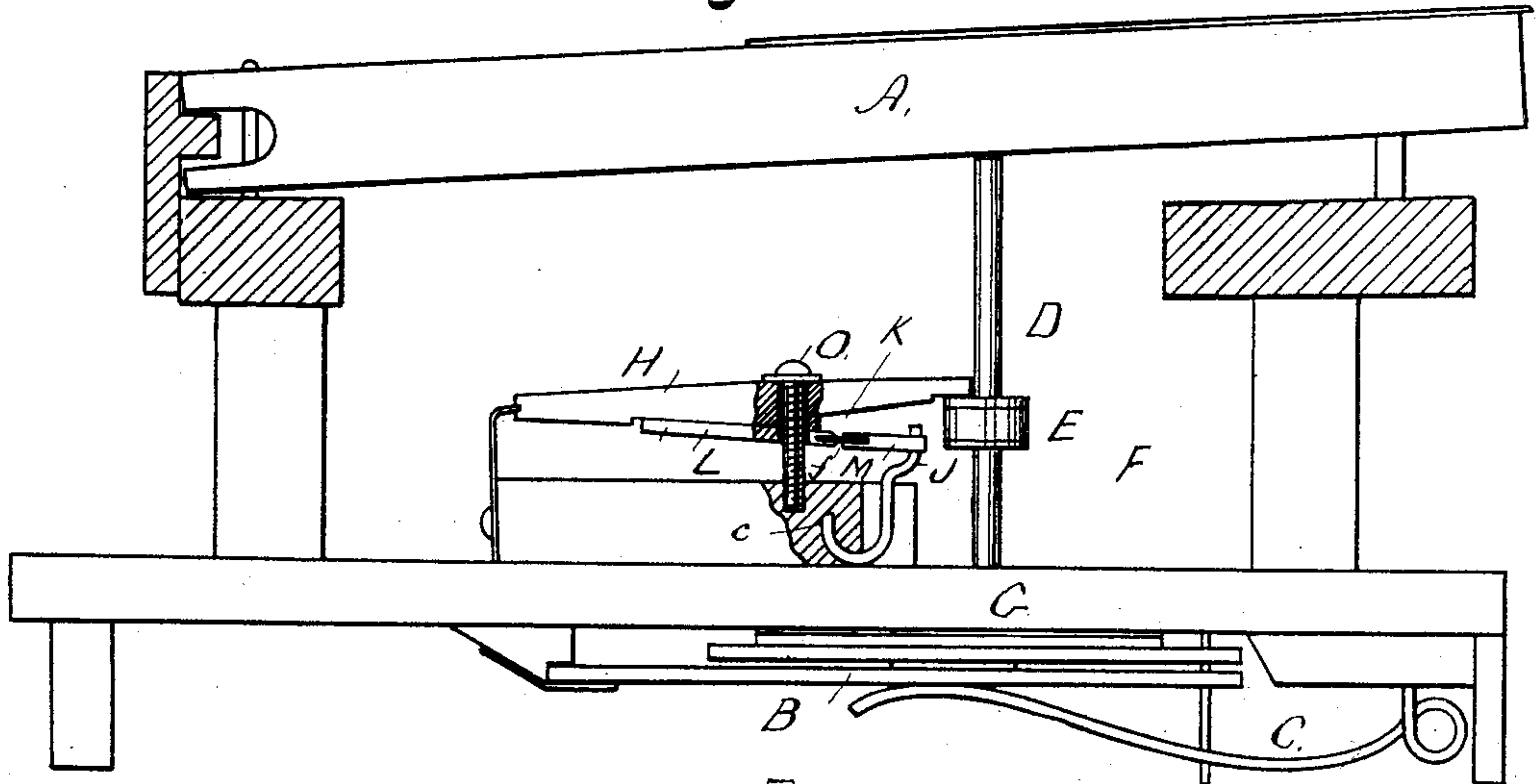
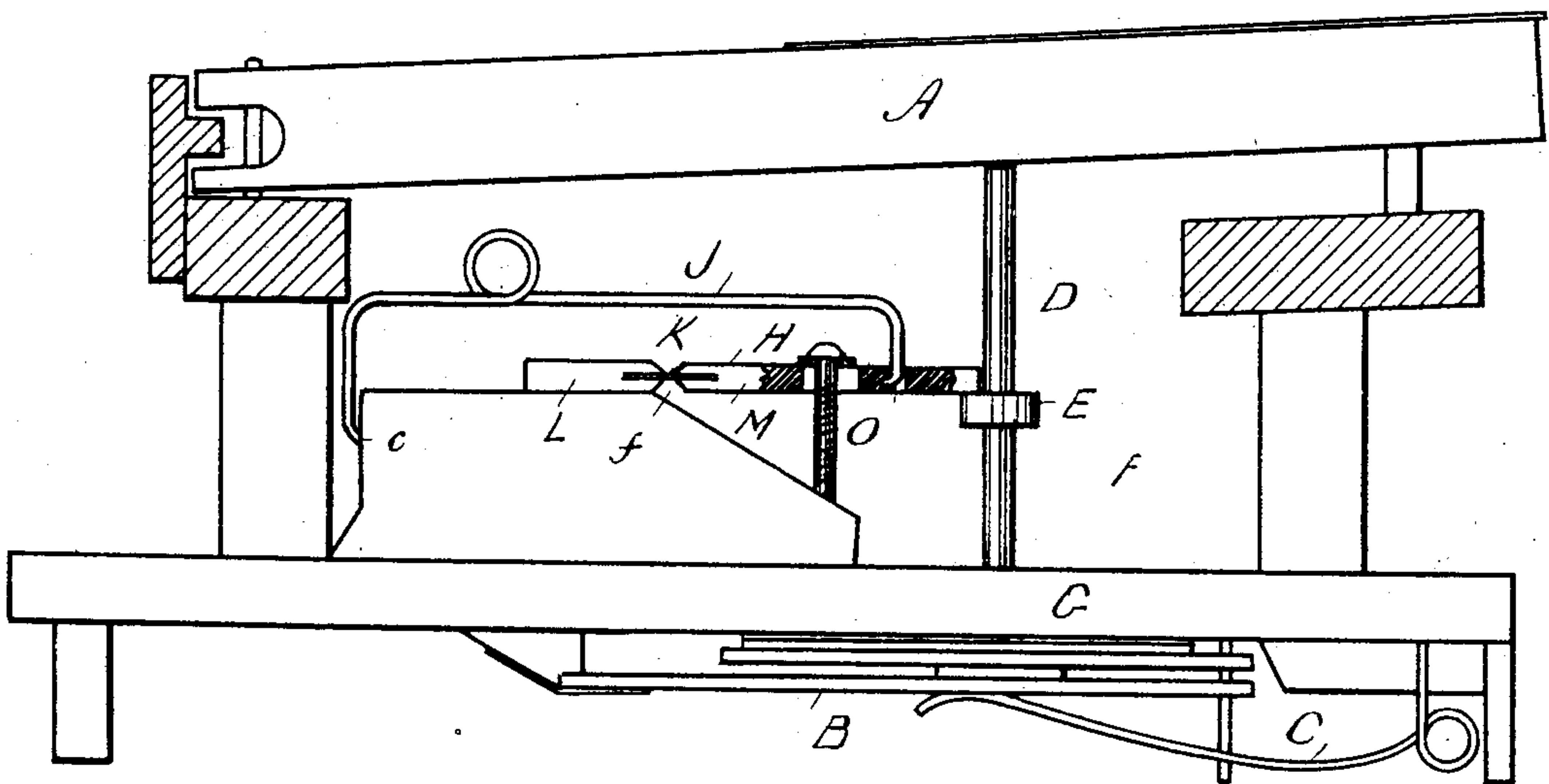


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN C. BRIGGS, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE MASON
& HAMLIN ORGAN COMPANY, OF SAME PLACE.

REED-ORGAN.

SPECIFICATION forming part of Letters Patent No. 229,369, dated June 29, 1880.

Application filed December 16, 1879.

To all whom it may concern:

Be it known that I, JOHN C. BRIGGS, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and
5 useful Improvements in Reed-Organs, of which the following is a full, clear, and exact description.

As well known, in reed-organs each valve is closed and kept closed by a spring, and is
10 opened and kept opened against such spring by pressing downward upon the finger end of its key.

The object of my invention is to assist the fingers of the player to depress the keys of an
15 organ, and at the same time to leave said keys normally under full control of their closing-springs; and it consists in a spring which is arranged and adapted for adjustment in relation to the valve to exert a continuous pressure thereon against its spring, but a pressure
20 less than that of such spring while the key is out of its normal position of rest, but when so at rest and the valve is closed to leave the valve practically subject to the full pressure
25 of its own closing-spring.

In the accompanying two plates of drawings, the several figures, 1, 2, and 3, are views, in side elevation, with parts broken out in vertical section, of a key and valve arranged and
30 connected together as ordinarily, and of a spring capable of acting substantially alike as to assisting the opening of the valve against its spring, in the manner described, and as will hereinafter appear.

In the drawings, A represents an organ-key; B, the valve; C, the spring to the valve, and D the pusher-stem, through which the key opens the valve when the finger end of the key is depressed, and through which the key is
40 raised by the spring of the valve when the pressure on the finger end of the key is removed, all as ordinarily; E, a button on the pusher-stem in the chamber F, below the key and above the reed-board or chamber G; H,
45 a horizontal lever under and in line with the key A. This lever at one end is in contact with the upper side of the push-stem button E, and at its other end, toward the rear end of the key, it turns on a fulcrum, *a*, of a sta-

tionary rail, *b*, so as to swing in a vertical
50 plane.

J is a spring-arm below the key, and fixed at one end, *c*, and adapted at its other end, *d*, and in itself, as will hereinafter appear, to act on the lever H, and through it on the pusher-
55 stem button E, and in so acting to exert a downward pressure through the lever H on the valve B against its spring (but at any and all times to exert a pressure less than the pressure of the valve-spring) when the key is in
60 motion in either direction, downward or upward, or in any other position except its normal position of rest, which is when the valve is closed, and when the key is in its said normal position of rest to be practically and substan-
65 tially free of pressure in a downward direction through the lever H on the pusher-stem button, leaving the valve then free to substantially the full force of its spring, to be by the pressure of such spring kept in a closed posi-
70 tion until such force or pressure is overcome.

Figure 1 shows the above described adaptation of the spring-arm J and lever H, with mechanism as follows:

K is a toggle-lever composed of two arms, 75 L and M, jointed, end to end, at *f*, and disposed below and along the length of lever H, where at one end, *g*, it is jointed to the spring-arm J, which is vertical, horizontally crossing it, and at the other end, *h*, to a stationary
80 block, *l*, located near the valve pusher stem D. This spring J is arranged to press on the toggle-lever in a line substantially coincident with a straight line drawn through the said three points of articulation of the toggle-lever, and
85 to follow up such pressure as the toggle-lever bends or moves either upwardly or downwardly.

The joint between the toggle-lever K and spring-arm consists of a notch, *m*, in the spring-
90 arm and a notch, *n*, in the lever, the two notches interlocking, as it were, with each other; and this construction serves to keep the lever always at one point of articulation with the spring-arm J, while at the same time
95 the parts can move or roll on each other.

The joint between the toggle-lever K and stationary block *l* is simply a parchment hinge

in a supplementary block, *o*, screwed to the said stationary block.

N is a headed pin passing from upper side of and loosely through lever *H*, and screwing into a block, *p*, hinged by parchment to the upper side of toggle-lever *K*, near its central articulation, *f*, and between the same and its end articulation at the stationary block *l*.

g is a felted washer between lever *H* and hinged block *p*, covering the length of such portion of said pin *N*.

O is a headed pin passing from the upper side of and loosely through the lever *H* and screwing into the stationary block *l*, having the toggle-lever *K* jointed to it. This pin, by its head, arrests the upward swing, and the stationary block *l* limits the downward swing of the lever *H*, and obviously, by simply screwing said pin into or out of the block *l*, the height of upward swing of the lever *H* may be regulated as desired, consistent with the length of the pin, and as to the downward swing of the lever *H*, that may be regulated in many obvious ways.

With a toggle-lever, *K*, and lever *H* applied to a pusher-stem, *D*, and connected and arranged together as described, and a spring-arm, *J*, adapted to press on the toggle-lever directly in a straight line through its three points of articulation, it is obvious that if the three points of articulation be in a straight line no movement of the toggle-lever will occur, and that if either of them be placed out of such line in either direction, then the toggle-lever, under the pressure of said spring-arm, will be moved or bent in that direction, whichever it may be; and as it is now arranged and connected, if such movement be in an upward direction, the lever *H* will be simply pressed against the head of screw-pin *O*, as it is stationary, which thus holds it from movement, and if such movement be in a downward direction the lever *H* will be pressed against the button on the pusher-stem to valve, forcing said push-stem downward, if such pressure be sufficient of itself to overcome the force of the spring on the valve *B*, but, if not sufficient of itself, acting to assist the key in such depression of the valve when the key at its finger end is pressed upon by the finger for such purpose.

Such being the principle of operation of the spring-arm *J*, toggle-lever *K*, and lever *H*, applied together and to the pusher-stem *D* of a valve, *B*, as above described, in order to accomplish with them the object of this invention, as has been hereinbefore stated, the spring-arm, even with all its opportunities for leverage on the pusher-stem, as above stated, is regulated or adapted to exert a lesser degree of pressure, even when exerting its greatest pressure, than the degree of pressure exerted by the spring *C* on the valve to keep the valve closed, and the several points of articulation of the toggle-lever *K*, through either one or both of the screw-pins, together with the spring-action of spring-arm, are adjusted

so that when the valve is closed and the key is at rest the lever *H* will be in contact with the button *E* of the pusher-stem, and in such contact have no practical or substantial downward pressure upon it from the pressure of the spring-arm on the toggle-lever *K*, while the instant such button begins to leave its said contact with the lever *H* from pressing on the finger end of the key it will immediately exert the pressure which is in the spring-arm, acting through the toggle-lever thereon, and follow with such pressure the continued downward movement of the said push-stem button as the finger end of the key continues to be depressed, thereby obviously automatically assisting to that extent in the opening of the valve against its spring, and giving to the key a lighter touch and otherwise improving it in feeling and sensitiveness of operation and movement, to the advantage of the player.

In the removal of the pressure applied to the finger end of the key to depress it, and through it the valve against its spring, the valve-spring then acts as ordinarily, to close the valve, forcing by its pressure the key back to its normal position of rest, and through the button on the pusher-stem the lever *H*, toggle-lever *K*, and spring-arm *J* also back to their normal position of rest, as hereinbefore described.

Figs. 2 and 3 each show mechanism, in connection with a key, *A*, and valve *B*, for the purposes of this invention.

In the mechanism of Fig. 2 the lever *H* is in one piece, or rigidly attached to one arm, *L*, of the toggle-lever. The end articulation or joint of such toggle-arm *L* is made yielding or elastic, and the spring-arm *J* is located at the end of the toggle-lever toward the pusher-stem *D* for the valve *B*. In these respects the mechanism of Fig. 2 differs from that of Fig. 1; but even with such differences, which obviously are of detail and not of essential elements, the mechanism of Fig. 2 is, to all intents and purposes, practically and substantially identical in construction, arrangement, and operation, and therefore needs no more particular description herein.

In the mechanism of Fig. 3 the spring-arm *J* is arranged to act directly on the lever *H*, instead of through an interposed toggle-lever, as in the mechanisms of Figs. 1 and 2, and in this respect differs from both of the same; but while it is preferable to employ the principle of action of the toggle-lever between the spring-arm *J* and the lever *H*, which directly presses on the button of the push-stem to assist in the opening of the valve, as described, it is plain that if the spring-arm be adapted and applied directly to the lever *H*, so as to press substantially and practically in a direction along its length toward its fulcrum when the lever is in a horizontal or level position, and also that if it be capable of exerting a downward pressure on the lever, if, as the lever swings below such horizontal position, such arrangement of spring-arm with a lever,

H, by being properly adjusted and regulated, substantially as in the other mechanisms, accomplishes the object aimed at, and in a manner and under conditions substantially and
 5 practically similar to those in the mechanisms previously described, and shown in Figs. 1 and 2, as is apparent without further explanation.

In the two plates of drawings there are several views, in detail, of the mechanism which
 10 has been herein described, and as their character is obvious from inspection and the letters of reference attached to them, it is not deemed necessary to herein more particularly refer to them.

15 In one plate, Fig. 4 shows the lever H as between two buttons on the pusher-stem, the one E below, and another, E², above, the lever, and this latter or upper one, E², should the center articulation of the toggle-lever K
 20 be above a line running through the two end articulations, carries the toggle-lever below such line as the pusher-stem is pressed down by the key, and thereby puts the toggle-lever into proper position for it to assist, as has been
 25 described, in the opening of the valve. This connection between the pusher-stem D and lever H interlocks the one with the other, and this may be secured, obviously, in many other ways.

30 Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with a key and its spring-closed valve of a reed-organ, of a spring
 35 which is arranged and adapted for adjustment to exert a continuous pressure upon the valve against its closing-spring, but a pressure less

than that of said closing-spring, while the key is out of its normal position, and when at rest and the valve closed to leave said valve prac- 40
 tically subject to the full pressure of its closing-spring, substantially as described.

2. The combination, with a key and valve of a reed-organ, of a lever H, resting at one end on a projection of the pusher-rod D, a toggle- 45
 lever, K, connected to the lever H, and a spring, J, pressing lengthwise of the toggle-lever, all combined and arranged to operate substantially as described.

3. A spring-band secured at its two ends, a 50
 lever hung upon a fulcrum at one end and at its other end at rest upon the upper side of a shoulder on the valve-stem, and a link pin or connection for the band and lever, in combination with the valve-key, substantially as de- 55
 scribed.

4. A link pin or connection for a lever and a spring-band, combined and arranged to operate upon a valve-stem of an organ, provided with an elastic cushion and screw-nut, sub- 60
 stantially as described.

5. In an organ-action, the combination, with the key and the vertical stem for actuating the valve, of a spring-actuated toggle-lever and a rigid horizontal lever connected there- 65
 with and having one end interlocked with the valve-stem, substantially as described, whereby said lever is positively moved both downward and upward, as and for the purposes set forth.

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Witnesses:

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