

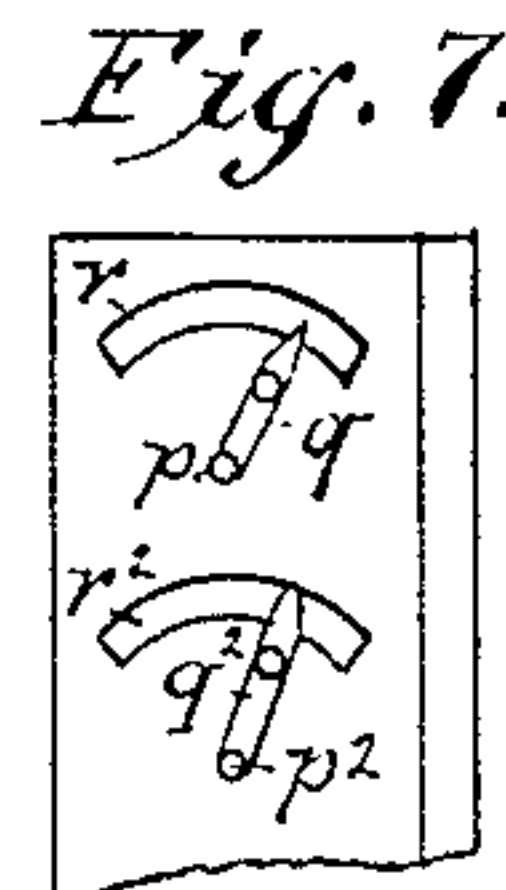
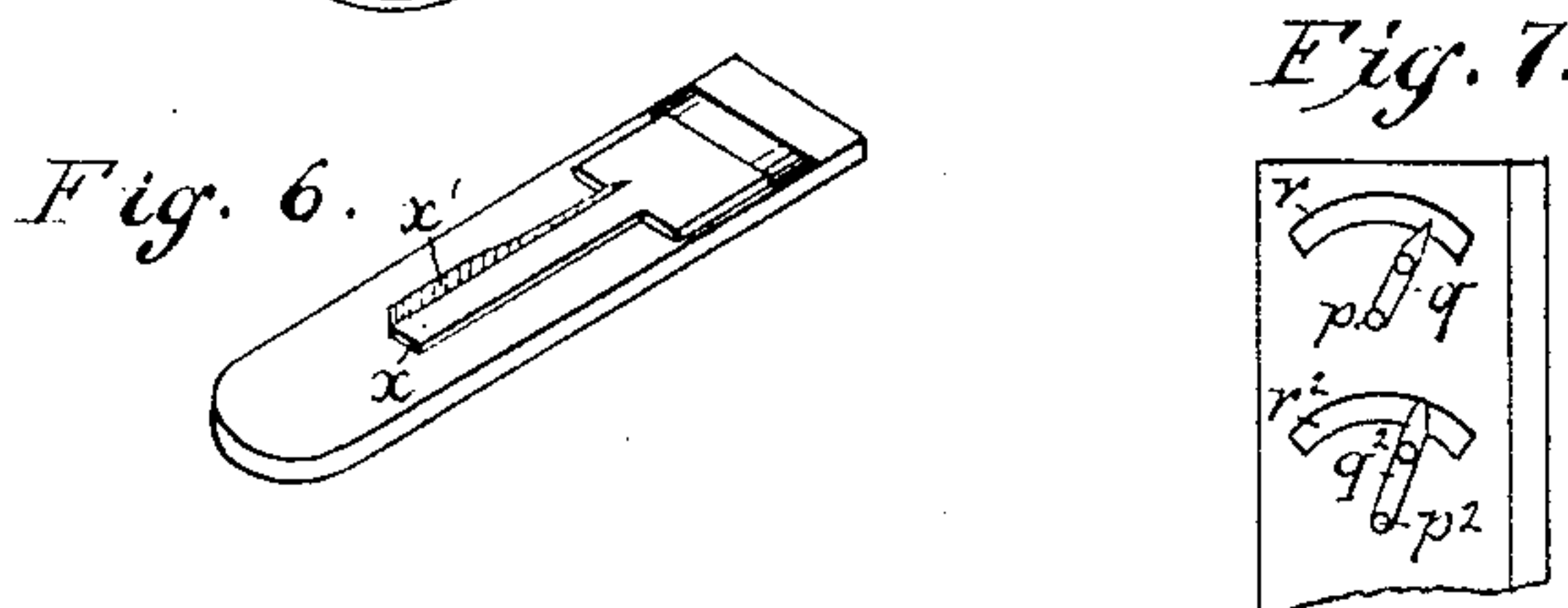
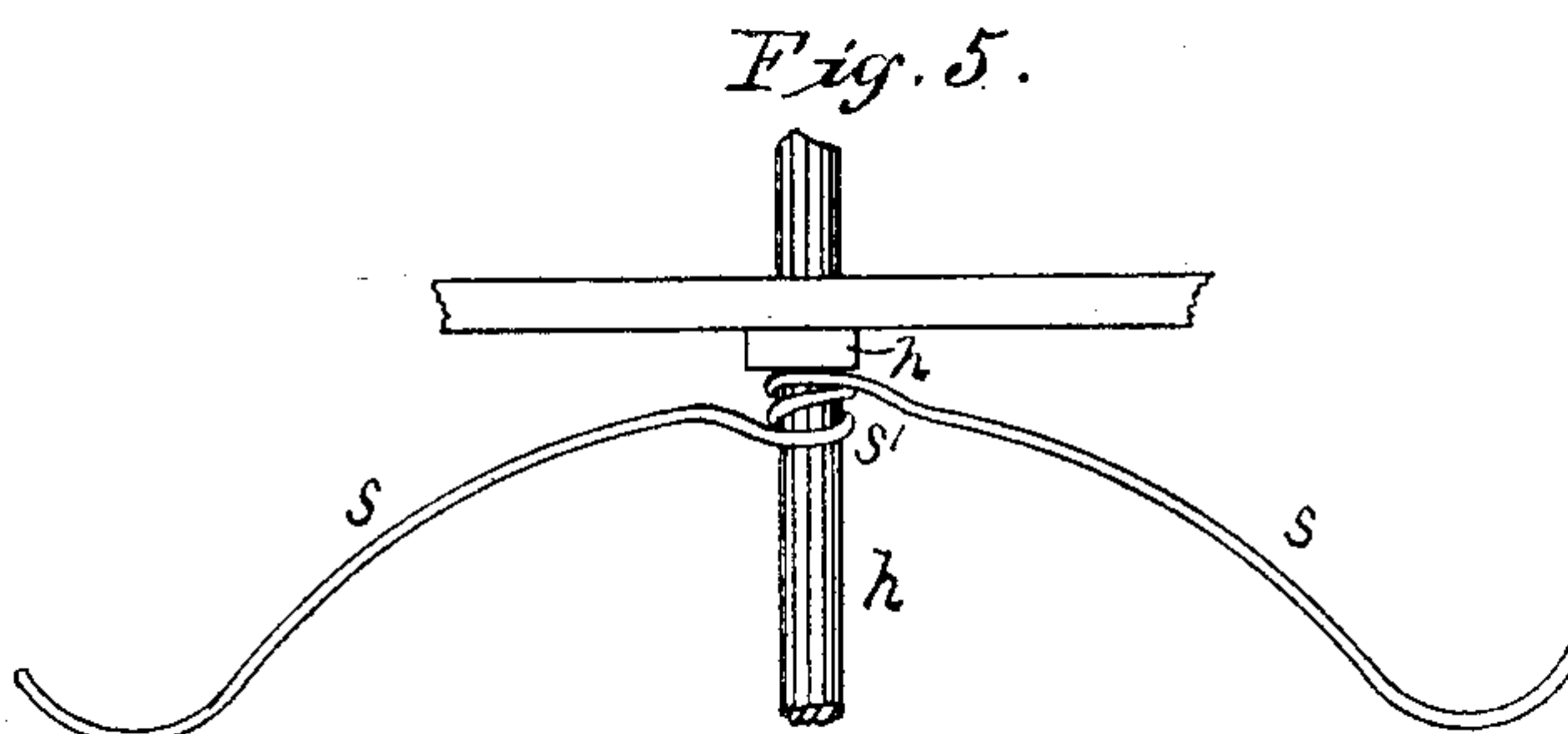
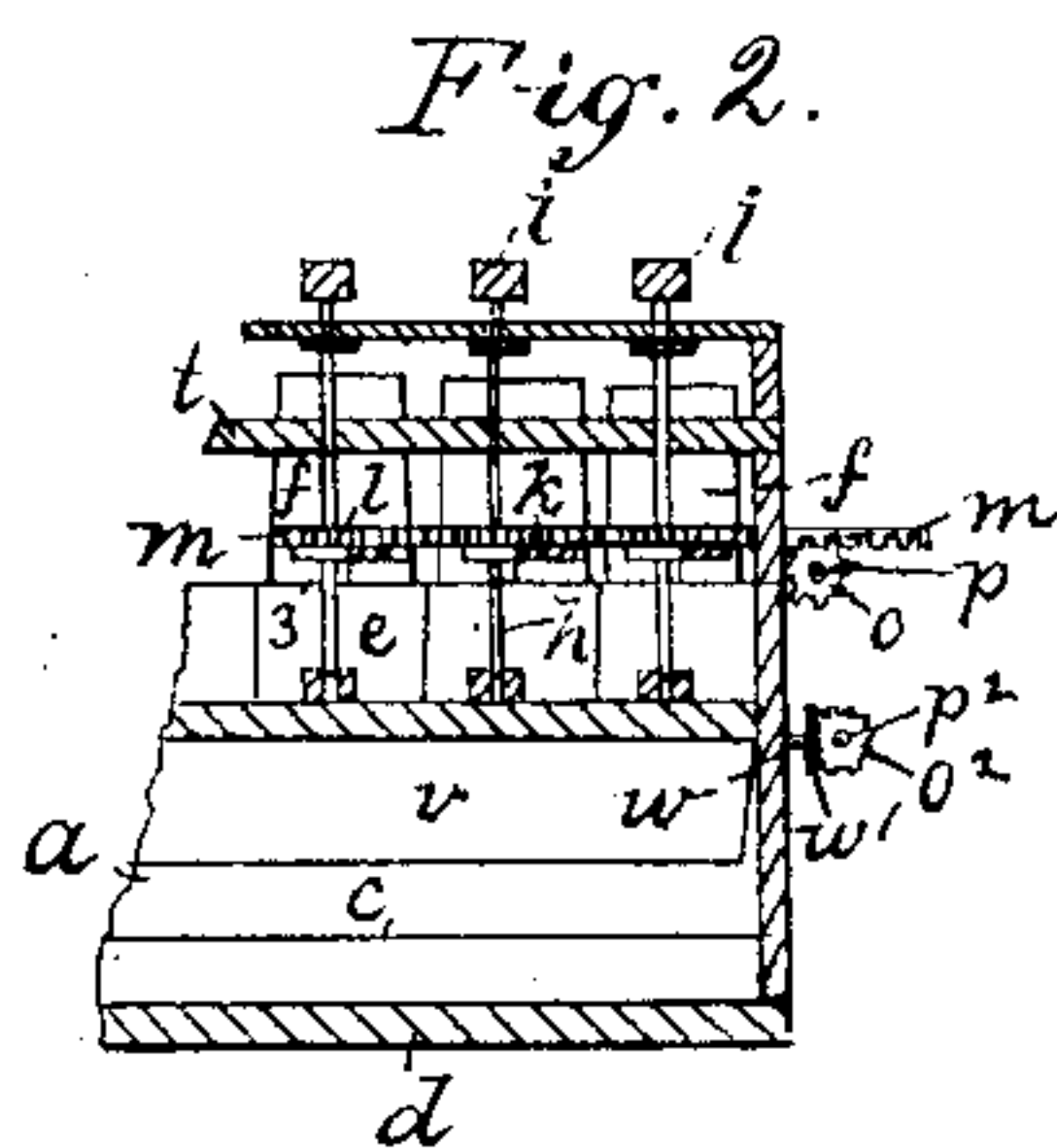
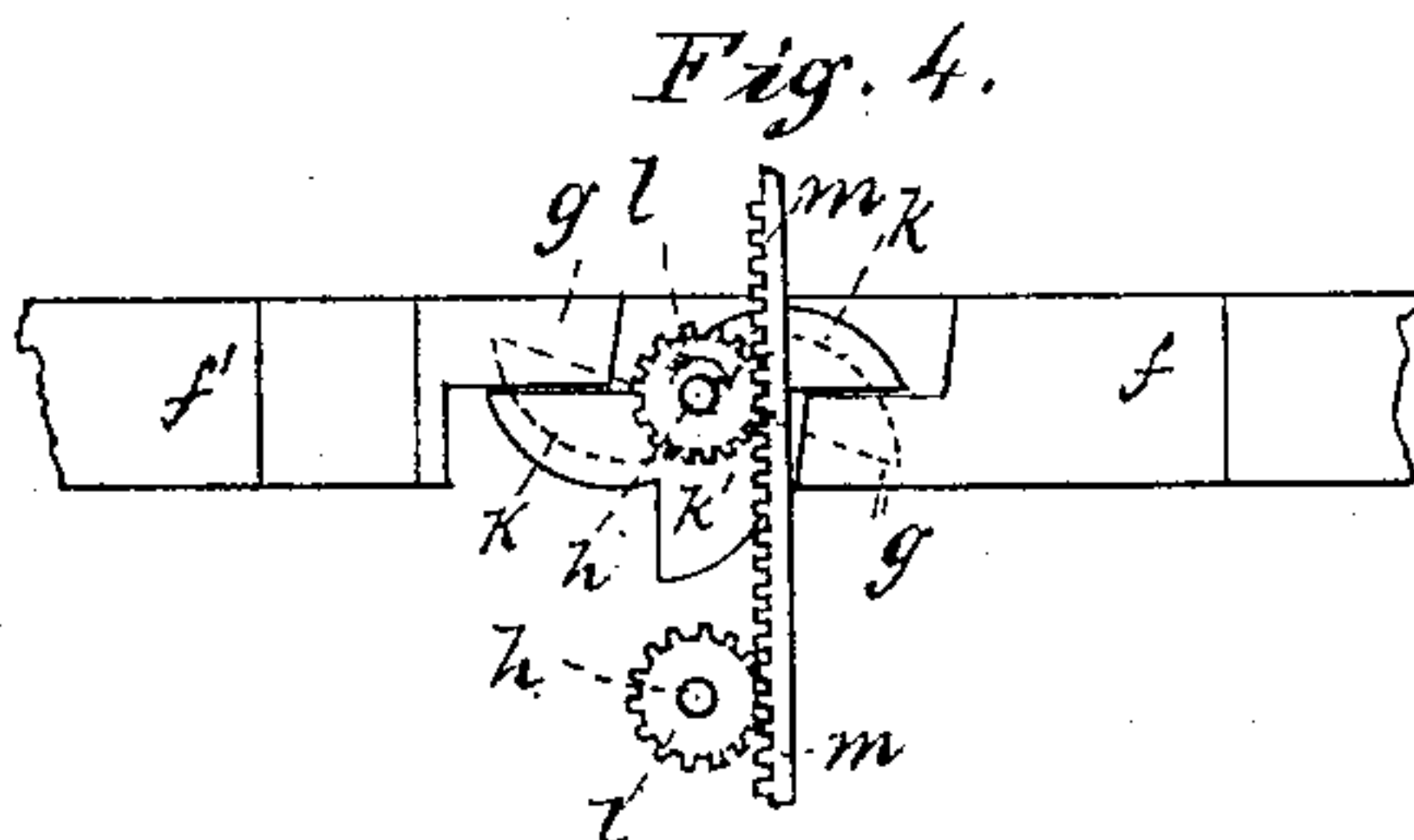
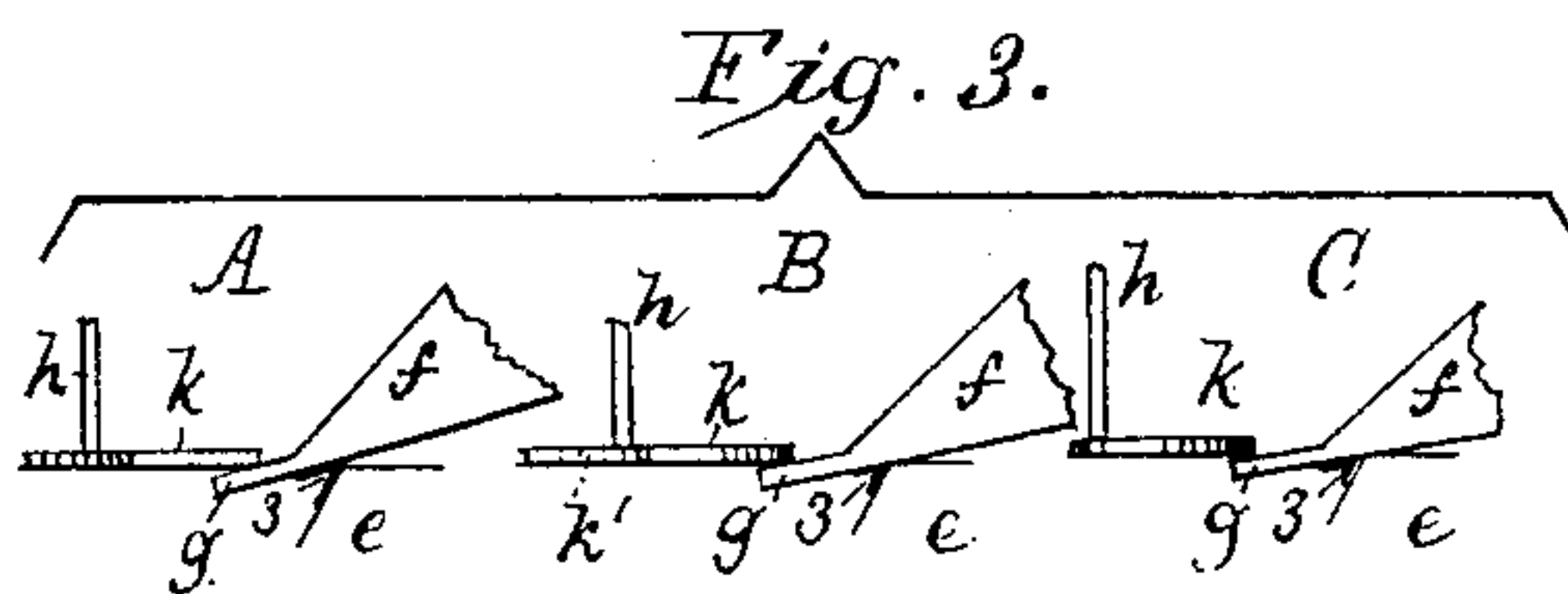
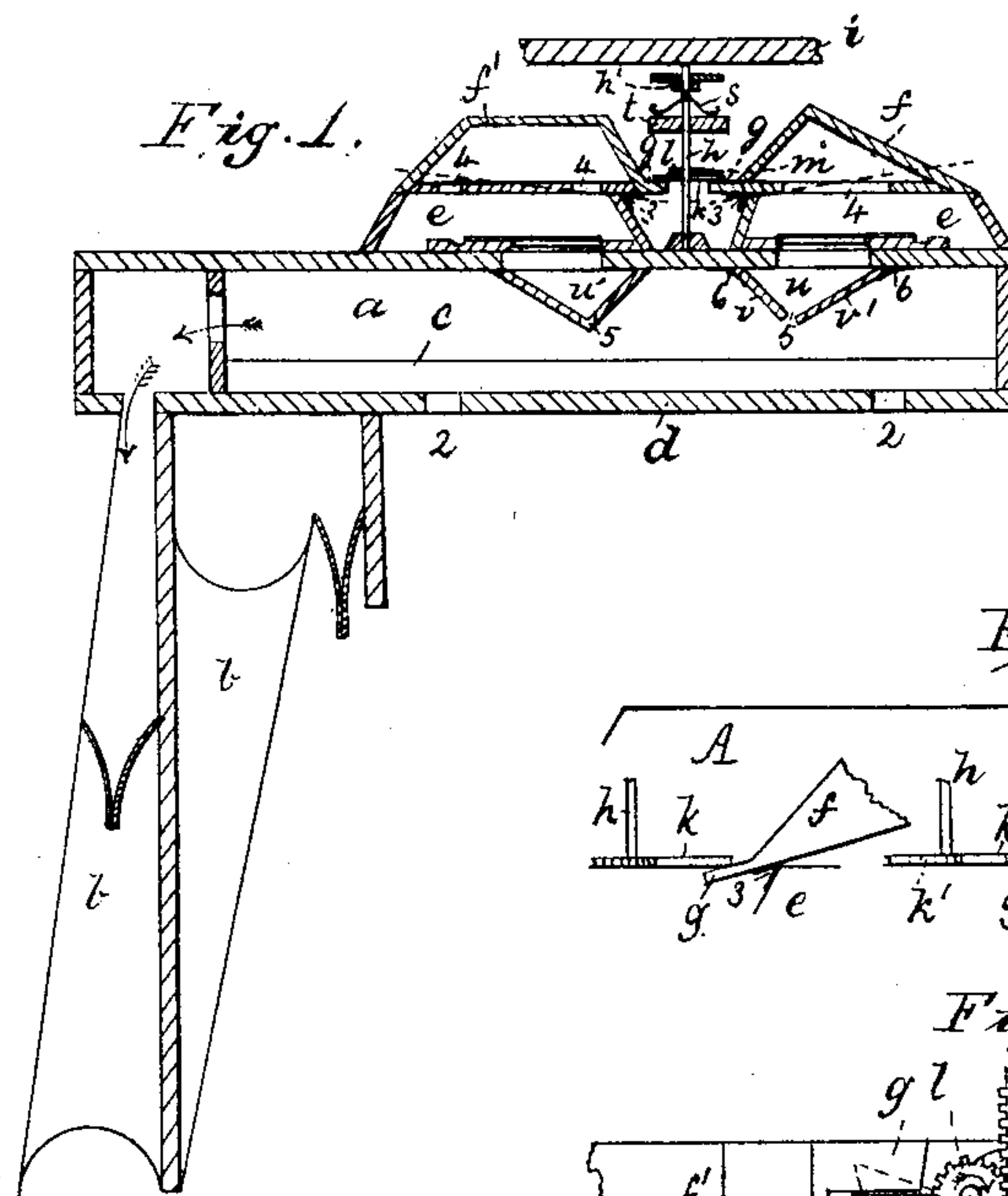
(No Model.)

W. L. MERRIN.

ORGAN.

No. 255,650.

Patented Mar. 28, 1882.



Witnesses.
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UNITED STATES PATENT OFFICE.

WILLIAM L. MERRIN, OF FREDERICKTOWN, OHIO.

ORGAN.

SPECIFICATION forming part of Letters Patent No. 255,650, dated March 28, 1882.

Application filed April 19, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. MERRIN, of Fredericktown, county of Knox, and State of Ohio, have invented a new and useful Improvement in Organs, of which the following description, in connection with the accompanying drawings, is a specification.

My invention relating to organs is shown embodied in a reed-organ, and has for its object to improve the quality and volume of tone. The rods that transmit the movement from the keys to the valves to open them are provided with controlling mechanism whereby the said valves are opened to a greater or less amount, thereby controlling their action as resonators, and enabling prominence to be given to the different harmonics or overtones, as desired, in order to vary the quality of the tone of the reed as desired. The reed-cells open below the reed-tongues into an auxiliary chamber, which is shown in one instance as common to several reeds and made of two strips or partitions converging together from the under side of the reed-supporting board, and one or both of the said partitions is preferably hinged upon the said board, so that the space between the converging edges may be enlarged or decreased to thereby qualify the sound issuing from the reeds. Beneath this auxiliary chamber and the reeds is placed a sound-re-enforcing device consisting preferably of a thin steel or iron diaphragm, or it may consist of an animal membrane or a sounding-board or series of rather loosely stretched strings by which the tones are amplified, and the effect of the instrument greatly improved. The reed-tongues are flanged or provided with ribs at one side, as hereinafter described, whereby peculiar and novel vibratory movement is imparted to them and novel sound results produced, this construction preserving the proper stiffness of the reed with a much smaller weight of metal than is needed in the common construction.

The invention further consists in details of construction of the keys and stop devices, as will be hereinafter described.

Figure 1 is a longitudinal section of a sufficient portion of an organ to illustrate my invention; Fig. 2, a vertical transverse section thereof; Fig. 3, a side view of the valve-oper-

ating device in three different positions, producing different amounts of opening for the same depression of the key; Fig. 4, a top view of one of the valve-operating devices in detail; Fig. 5, a detail of the novel form of spring employed with the valve-operating rod; Fig. 6, a perspective view of a reed embodying my invention, and Fig. 7 a detail illustrating the stop motion.

The wind-chest *a*, connected with the bellows *b*, of any usual construction, is provided with a sound-re-enforcing device, *c*, shown in this instance as a thin diaphragm, of steel or iron or animal membrane, forming the bottom of the closed air-space in the wind-chest, while the bottom proper, *d*, of the chest serves to protect the said membrane from injury, and is provided with openings 2, which give the air below the diaphragm *c* free communication with the external air to allow the diaphragm to vibrate properly. Instead of a membrane or diaphragm, loosely-stretched strings may be employed, as they will vibrate in unison with sounds of different pitch, and in this case the bottom *d* of the chest *a* will be air-tight.

The top of the wind-chest is provided with the usual series of reed-cells, *e*, which are in this instance closed on all sides and covered at the top with the valves *f f'*, pivoted at 3, and each provided with a projection, *g*, to be actuated by the valve-operating rod *h* when depressed by the key *i*, of usual construction. The said rod *h* is provided with feet *k k'* (see Fig. 4) to engage the projections *g* of the valves, two of the said feet (marked *k*) being opposite one another and adapted to open both sets of valves *f f'* simultaneously, while the third foot, *k'*, when brought into the proper position, as hereinafter described, will engage one or the other of the valves *f* or *f'* and open it independently of the other.

The rods *h* are provided with pinions *l*, which mesh with the teeth of a rack-bar, *m*, common to an entire series of the said rods, so that by a longitudinal movement of the said rack-bar the said rods are all turned simultaneously, and in this movement the feet *k k'* are brought into position to engage or not the projections *g* of the valves. These feet are so shaped that as they are turned with the rods they engage the projections *g* at points more or less remote

from the hinges or pivotal points 3 of the valves $f f'$, so that an equal amount of depression of the said rods by the keys i will raise the valves to different heights from the reed-cells, thus controlling the amount of air admitted to operate the said reeds. This operation is best illustrated in Figs. 3 and 4, in the latter of which the feet are shown in full lines in such position that they do not engage either of the projections g , and the valves will accordingly not be opened when the keys are depressed, so that placing the feet in this position serves to stop all the reeds operated by the valves and keys controlled by the same rack-bar, m . When turned a short distance in the direction of the arrow, Fig. 4, the feet k are brought in position, as shown in dotted lines, to engage the projections g near the fulcrum 3, so that the valves $f f'$ are elevated the greatest distance, as shown at A in Fig. 3. As the rods h are turned still farther in the direction of the arrow the feet k will engage the projections g at greater distance from the pivot 3, and open the valve less and less, as shown at B and C, Fig. 3, and will finally pass wholly beyond the projections g , after which the foot k' will be in position to engage the valve f' , which will alone be operated, the valves f and corresponding reeds being then stopped or inoperative. By turning a short distance in the reverse direction to the arrow from the position shown in full lines, Fig. 4, the foot k' will engage and operate the valve f , while the one f' remains inoperative. The valves $f f'$ are made as hollow chambers, the air-space within them being connected with that in the reed-cells by one or more holes, 4, so that the air in the said space is set in vibration by the reed, and by varying the position of the valve when opened different harmonics or overtones of the reed may be strengthened and the quality of the tone thus varied.

The rack-bar m is actuated to turn the rods h and their feet k , in order to control the operation of the valves, as just described, by any suitable mechanism within the reach of the performer on the instrument. As herein shown, the said bar is provided at its end (see Fig. 2) with teeth on its under side meshing with a pinion, o , fixed on a shaft, p , extended forward to the side of the key-board, where it is provided with a handled crank or pointer, q , (see Fig. 7,) to enable the operator to turn it.

An arc, r , is employed, properly marked to indicate the point at which the handle is to be stopped in order to produce the desired quality of tone.

The springs, by which the rods h are pressed up against the keys i and raised when the keys are no longer depressed, are of peculiar construction illustrated in Fig. 5, they each consisting of two flexible or elastic arms the extremities of which bear upon a suitable fixed portion of the frame-work t , (shown in Figs. 1 and 2,) the said arms being connected together by a spiral portion, s' , encircling the rod h and

pressing upward on a shoulder, h' , on the said rod. The coils of this spiral portion yield as the rod h is depressed and the angle of the spring-arms is changed, making a much more delicate and evenly-acting spring than would be produced if the action either of the arms or of a spiral spring alone were depended on.

Beneath the reeds and within the wind-chest a are placed auxiliary chambers $u u'$, having an opening, 5, above the re-enforcing device or diaphragm c , the impulses of the air in the chamber u , produced by the vibrations of the reed, having a much more marked effect upon and in connection with the said diaphragm than if the reeds vibrated in direct connection with the wind-chest a in the usual manner.

The quality of the tone or sound produced will depend to a large extent upon the size and shape of the chambers $u u'$ and upon the size and position of the aperture 5. The chamber u' is shown as of fixed dimensions, and an independent chamber is used for each reed, while the chamber u is shown as common to a series of the reeds, and is separated from the wind-chest by the long partitions $v v'$, one or both of which are preferably pivoted as at 6, (see Figs. 1 and 2,) being mounted upon a shaft, w , Fig. 2, provided with a bevel-pinion, w' , meshing with a bevel-pinion, o^2 , mounted on a shaft, p^2 , operated by a pointer, q^2 , (see Fig. 7,) similar in function and operation to the one 9 by which the valves are controlled, as hereinbefore described. In this manner the partitions $v v'$ may be turned on their pivots 6 to vary their inclination and the consequent size and shape of the chamber u , formed by them, and the form and position of the aperture 5 between them, thus producing various qualities of sound, the effect of which is much improved by the diaphragm c .

One of the partitions, as v' , may be made to move up to the reed-sustaining board to close the aperture therein beneath the reeds, and thus act as a stop-valve for the said reeds.

The reeds are preferably of the kind shown in Fig. 6, the tongues x , mounted in any usual frames, being provided with a flange, x' , extending along one edge only, the object being to give great stiffness to the reed-tongue in proportion to its weight, whereby the pitch of a thick heavy reed is produced; but owing to its lightness the tongue is much more promptly or quickly set in vibration than a thicker one.

Placing the flange at one side only of the reed-tongue or making the struck-up or stiffening portion unsymmetrical, imparts a richness and peculiar quality to the sound produced; and reeds of this construction may be voiced or their tones otherwise varied in the same manner as reeds of ordinary construction.

I am aware that a reed-frame has been provided with a chamber beneath the reed and formed as a part of the reed-frame, and I do not broadly claim such a chamber.

I am also aware that a reed-tongue has been provided with wings at its edges and near its

tip, they being constructed with a view to controlling the flow of air through the tongue-opening in the reed-frame, and not performing the function of my stiffening flanges or corrugations, as they add to the weight of the reed-tongue without materially increasing its stiffness.

I am also aware that valves made as hollow chambers have been employed, they having been located in the wind-chest below the reed-cells and not upon the outside of the reed-cell, as herein shown.

I claim—

1. In an organ, the pivoted valves and valve-operating rods provided with feet to engage the said valves, combined with mechanism, substantially as described, under control of the operator, to change the position of the said feet and vary their action upon the valves, as and for the purpose set forth.

2. The valve and valve-operating rods provided with feet to engage the said valves and having pinions connected therewith, combined with a rack-bar meshing with the said pinion and means to move it longitudinally, whereby the operator is enabled to rotate all the said rods simultaneously to control their operation on the valves, substantially as described.

3. In an organ, two series of reeds and valves therefor, combined with a series of valve-operating rods, each provided with feet arranged and adapted to engage and operate a valve of each series simultaneously or to engage a valve of either series, as desired, independently of the other series, substantially as described.

4. The wind-chest and reeds mounted thereon, combined with the sound-re-enforcing device in the said wind-chest and the independent chamber below the reeds in the wind-chest, provided with an orifice or aperture above the said re-enforcing device, substantially as and for the purpose set forth.

5. The wind-chest and reeds, combined with the chamber common to a series of the said reeds, and having one or more of its sides mounted on hinges or pivoted and provided with means to move it thereon, whereby the form and size of the said chamber may be varied to modify the quality of the sound produced, substantially as described.

6. The combination, with the key and rod operated thereby, of the spring to maintain the rod in engagement with the said key, it consisting of the elastic arms and the spiral portion connecting them, substantially as and for the purpose described.

7. The reed-tongue consisting of a plane portion of usual form, provided with a stiffening-flange at one edge only, whereby a peculiar vibrational movement and novel quality of sound are produced, substantially as described.

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

WILLIAM L. MERRIN.

Witnesses:

JOS. P. LIVERMORE,
BERNICE J. NOYES.