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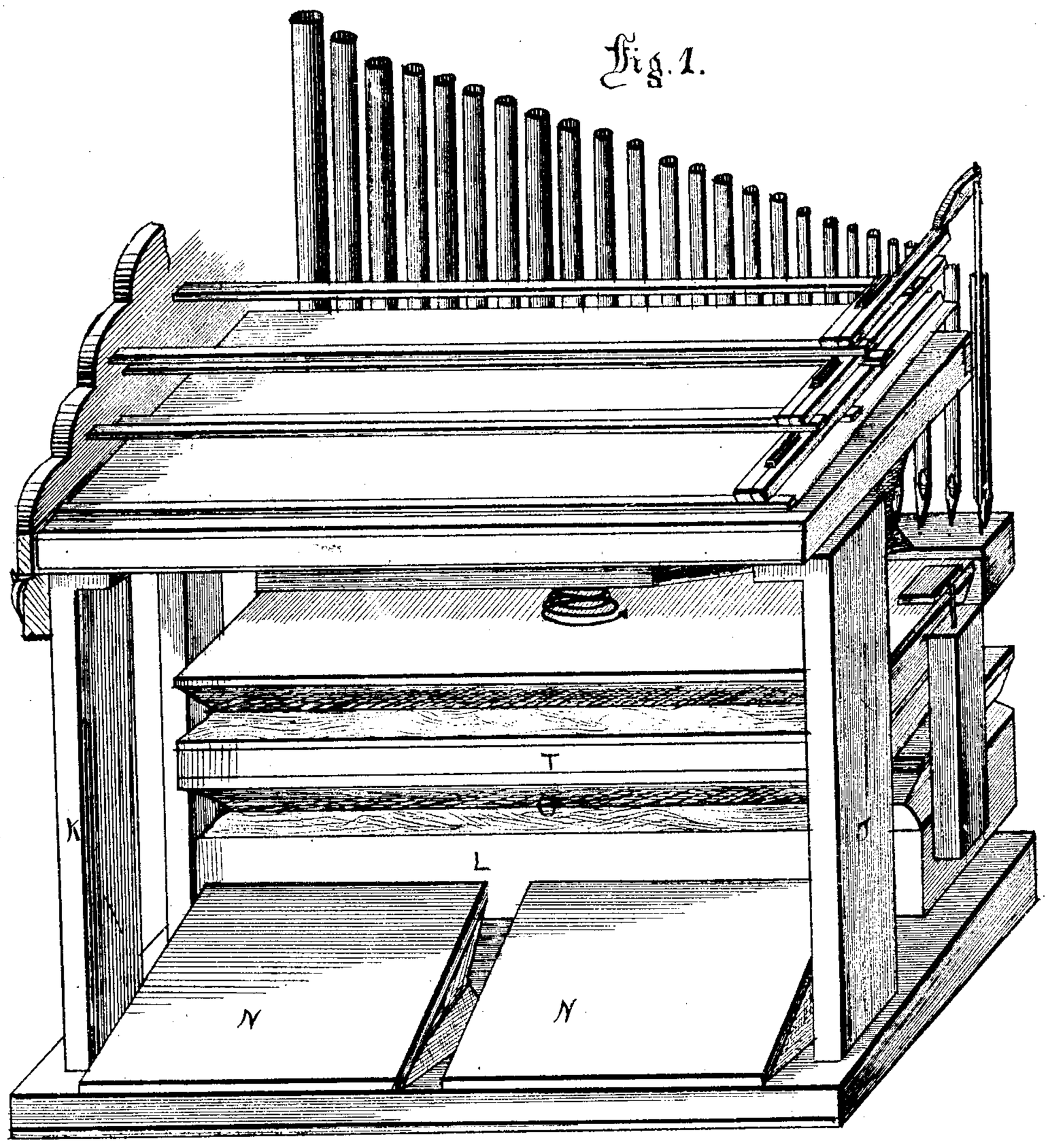
ORGAN.

No. 103,723. Patented May 31, 1870.

Fig. 1.



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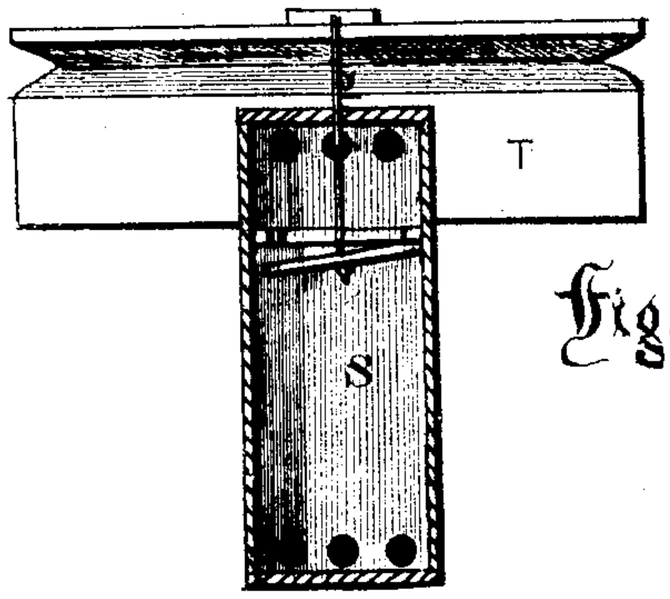

Fig. 3.

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Fig. 2.

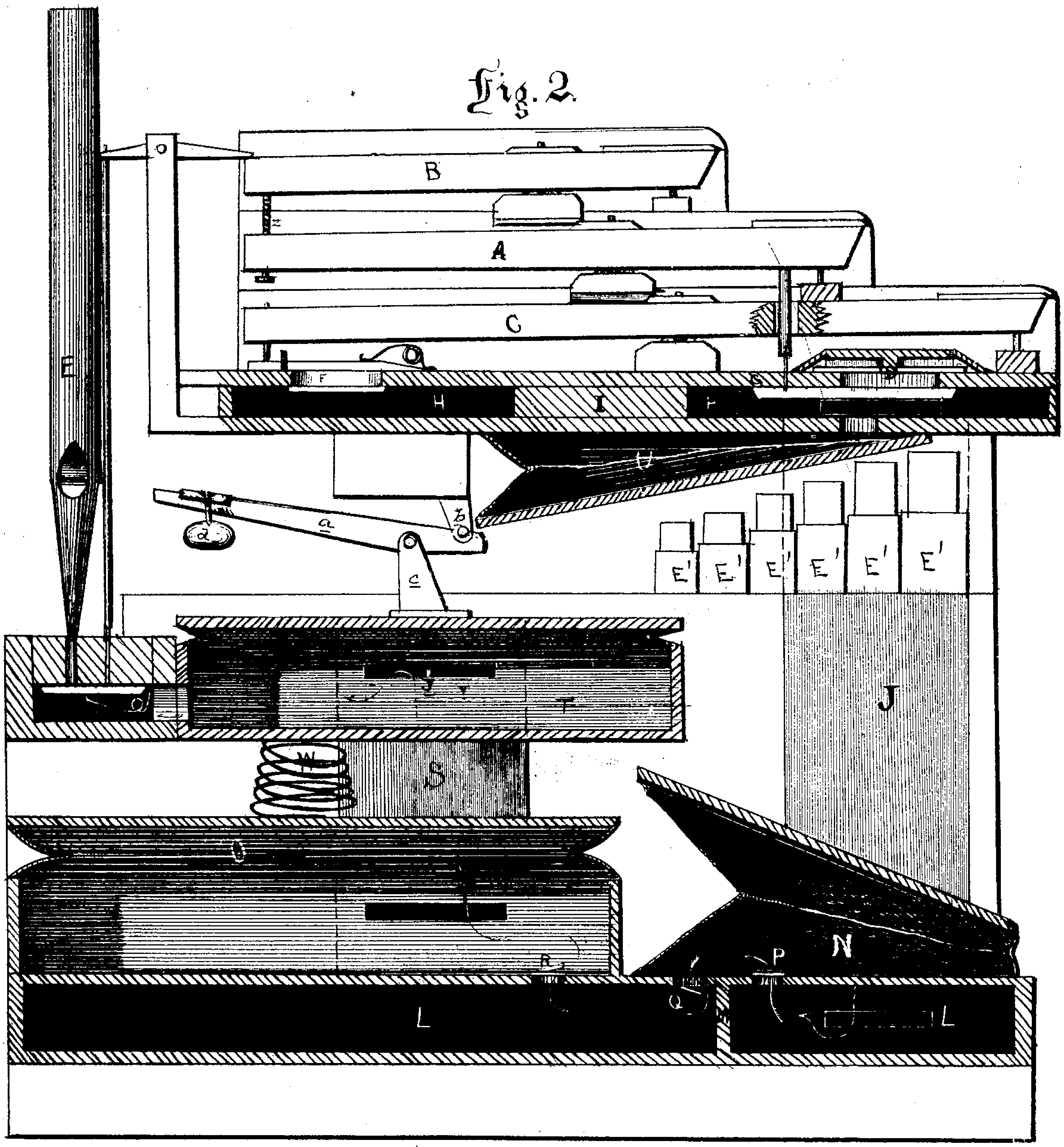
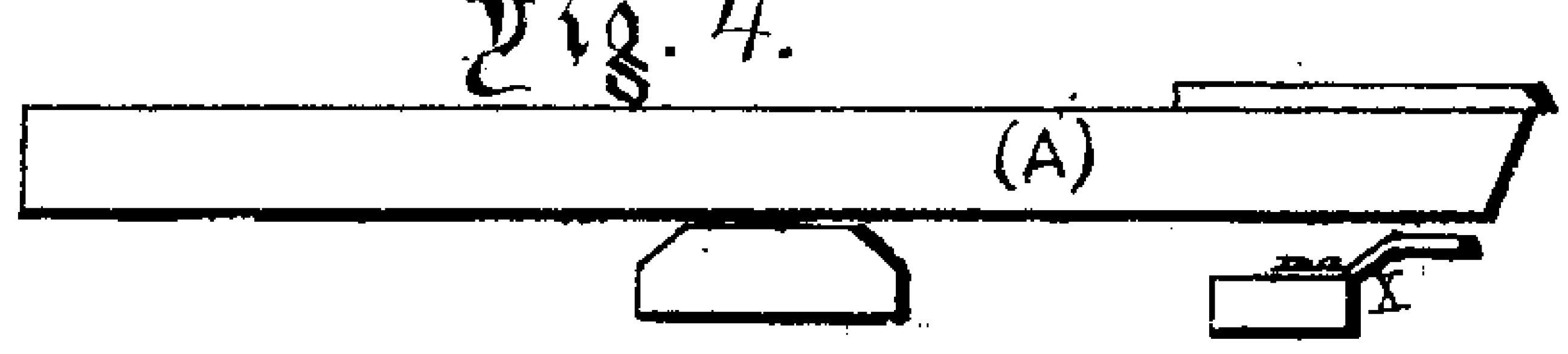


Fig. 4.



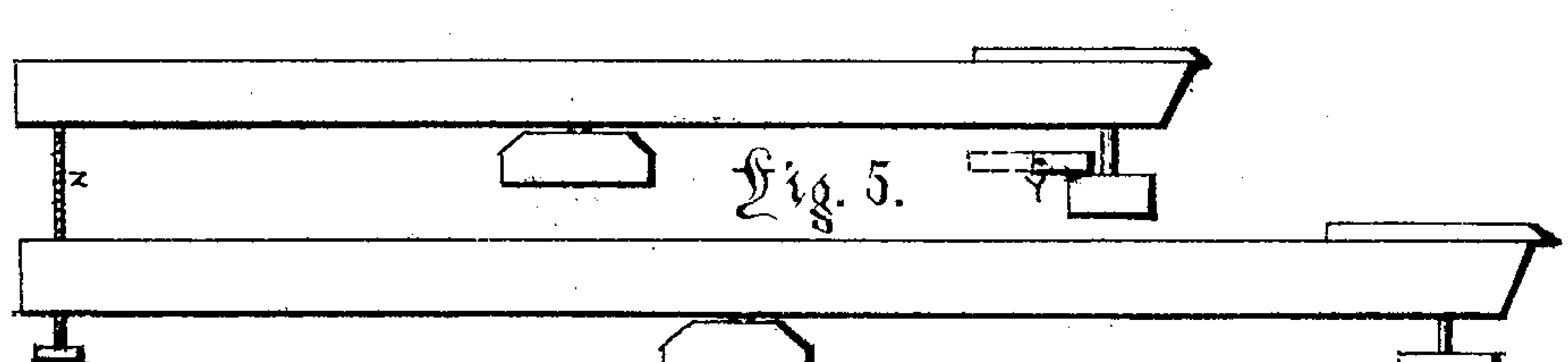


Fig. 5.

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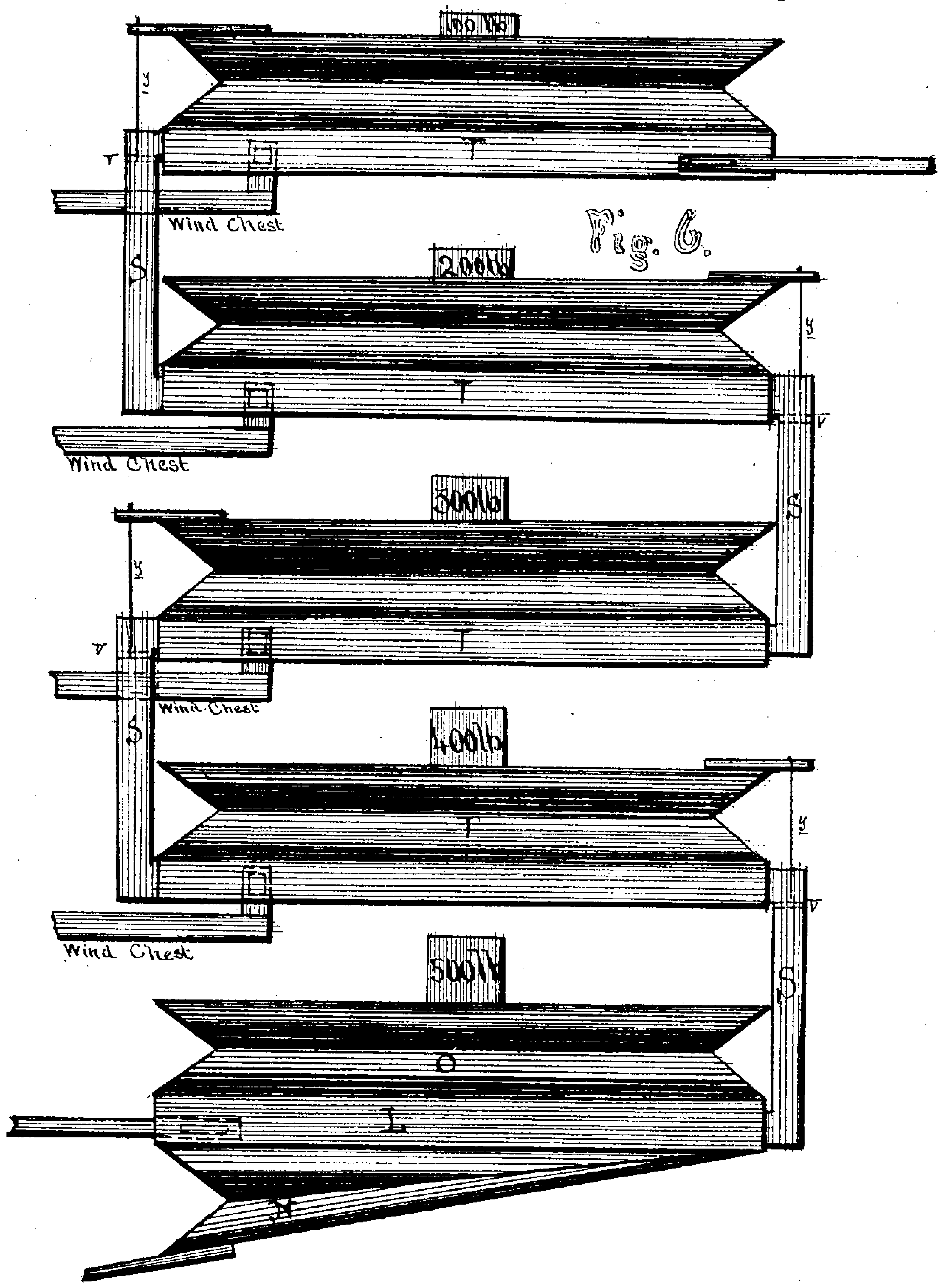

Fig. 6.

ORGAN.

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ORGAN.

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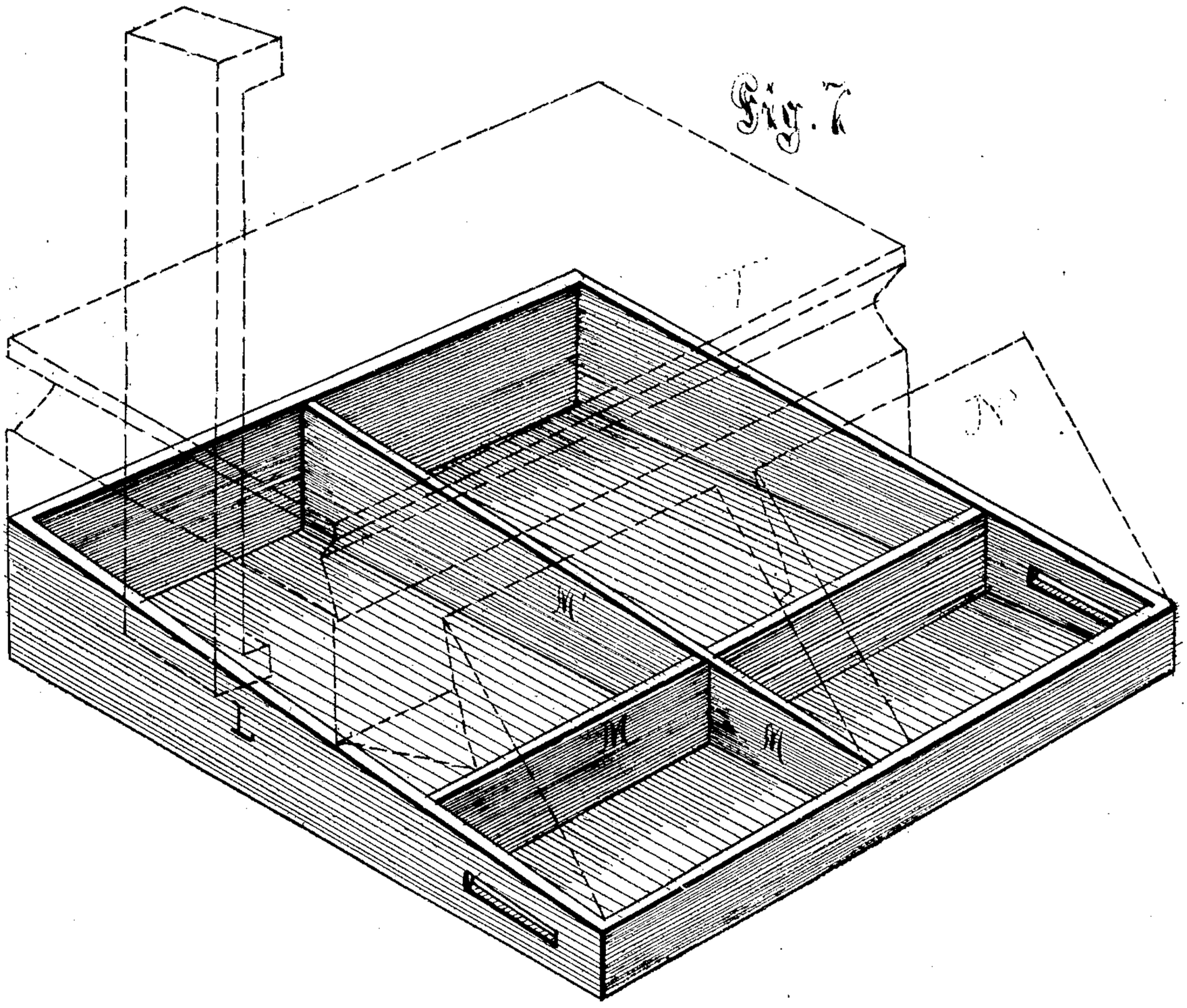
Fig. 7



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United States Patent Office.

CHARLES H. DAVIE AND WILLIAM JACKSON, OF CHICAGO, ILLINOIS.

Letters Patent No. 103,723, *dated May* 31, 1870.

IMPROVEMENT IN ORGANS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that we, CHARLES H. DAVIE and WILLIAM JACKSON, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Organs; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, in which—

Figure 1 is a perspective view of the internal arrangement and mechanism which forms the subject of this invention.

Figure 2 is a sectional elevation of the same.

Figure 3, vertical section of one of the feeding-trunks, showing the regulating check-valve.

Figures 4 and 5 represent different arrangements of the keys.

Figure 6 represents an arrangement of a series of reservoirs under different pressures.

Figure 7 is a perspective view of the wind-chest at the bottom of the instrument.

Our invention relates more particularly to that class of instruments known as reed-organs.

Its object is to enlarge the capacity of said organs, by combining therewith organ-pipes or free reeds, sounded upon the French system, and by enabling the performer to produce at will any particular note or series of notes with increased prominence.

American reed-organs are distinguished by the peculiarity known as the exhaust-bellows, the wind being drawn through the reeds inward by the bellows, instead of being forced through by the bellows outward, which latter is known as the French plan or system.

Our invention consists, therefore—

First, in a combination of exhaust and pressure-bellows in the same instrument, and conveniently operated by the same power and using the same wind.

Second, in the construction and arrangement of the feeders and the receiving wind-chest.

Third, in the exhaust-regulator, combined with the American reeds.

Fourth, in the arrangement of a regulating-valve, to prevent an undue pressure in the reservoir.

Fifth, in the device by means of which any one note may be coupled with additional reeds or pipes, and thus produce unusual prominence of tone.

That others may fully understand our invention, we shall now particularly describe the construction and operation of an instrument combining the different parts of the same, as above enumerated.

In the drawing three banks of keys are represented, though that particular number is not necessary to the accomplishment of the results attained in our invention. Said banks are designated by the letters A B C. The keys of the bank A operate primarily the reeds D, which are sounded on the American plan, by an exhaust-bellows. The keys of the bank B operate primarily the valves of the organ-pipes E, which are necessarily sounded by pressure, and the keys of the bank C operate primarily the valves of the French reeds F, which are also sounded by pressure.

This arrangement of keys in separate banks is preferred, because it posseses advantages which are familiar to musicians, though it is evident that the various combinations of American and French reeds and organ-pipes might be produced with a less number of keys and a proper arrangement of couplers or stops.

In the drawing we represent a series of couplers, by means of which the several banks may be joined as desired; but the use of coupling devices is so well understood that it is not necessary to describe them particularly.

G is the reed-board, in which the American reeds D and the French reeds F are set.

Below the reed-board G is a wind-chest, H, divided longitudinally by the partition I, forming two chambers, communicating, respectively, with the exhaust and pressure-bellows.

At the bottom of the instrument is another wind-chest, L, divided by the partitions M and M', and the exhaust and pressure-feeders N are located thereon.

The trunks J K open into their respective compartments of said chest, and connect it with the upper wind-chest H.

The exhaust and pressure-feeders N are separate bellows, placed beneath the treadles, so as to be operated by the feet, though this arrangement is more for convenience than necessity, except, perhaps, in very small instruments, as it appears evident that they may be operated by any other power.

The pressure-bellows O is located upon the rear portion of the wind-chest L, and receives its wind from the exhaust and pressure-feeders N, which inflates the pressure-bellows O with wind drawn or exhausted from the exhaust-bellows U, and through the American reeds D.

Suitable valves P Q R are provided, to prevent any return of the wind thus transmitted by the feeders N.

From the pressure-bellows O wind passes through trunks S to the reservoirs T provided for the various stops. As before stated, the best results require different pressures of wind for organ-pipes of different classes or for French reeds, and we, therefore, employ as many reservoirs as may be required in the particular instrument, and weight each reservoir according to the pressure required. Each reservoir may be fed by a separate trunk, S, from the principal pressure-bellows O, or the various reservoirs may be connected with each other in the order of their pressures, as shown in fig. 6.

Without some regulating or governing device the reservoir T might become full, and, if air continued to be forced in, the pressure would thereby be increased. To prevent this condition, valves have been arranged to permit surplus air to escape, but we prefer to control the amount of air to be admitted by a check-valve, which shall close the inlet before the reservoir is entirely full, and thus save wind and power. To this end the valve V is placed within the trunk S. Said valve is fully open when the reservoir is collapsed, and begins to close as soon as the reservoir begins to expand. As the reservoir is more and more inflated the valve closes, and cuts off the inflow of wind before the reservoir is full. This is accomplished in a simple and efficient manner, by connecting the valve V and cap of the reservoir, by means of a wire, *y*, as shown in fig. 3. When the reservoirs are connected as in fig. 6, then each connecting-trunk is provided with a similar valve, and the equilibrium will be perfectly maintained in all of the reservoirs.

In order to enable the performer to give unusual prominence to any particular note, the keys A are provided with springs X, placed beneath the touch, which will resist the downward motion of the keys past a certain point. This limit will be that of the key as ordinarily struck, when, however, the key is pressed so as to flex the spring X, then the increased movement of the key causes another valve to open, and an additional reed or pipe is sounded.

In fig. 5 is shown a modification of the above-described method. The sliding jack Y is interposed between the key and its bearer, and the motion of the key is thereby limited; but, when said jack is withdrawn, the key may be still further depressed, and the coupling-wire *z* will then cause the corresponding key of the next bank to be depressed.

The advantages secured by the improvements above described are very great. The variety of effects not hitherto attainable is important and beautiful, and among the principal advantages not hitherto mentioned is the perfect steadiness of the wind in the reservoirs, even when the feeders are worked with great irregularity or violence.

Suitable escape-valves are provided to the principal pressure-bellows O, to relieve it from over pressure.

Proper feeding-valves are also provided, to admit air to the feeders N, when the American reeds are not being sounded.

It is manifest that it is not necessary that the exhaust-bellows or feeders should be operated by the feet. That is merely a convenient arrangement for small instruments. Said feeders may be located in any convenient part of the instrument, and may be operated by any suitable power.

The number and variety of the changes and musical combinations which may be produced by the application of our system is very great, and the effects new and beautiful.

E′ E′ represent a series or stop of pipes arranged along the side of the instrument.

Having now described our invention, its principles, and application,

What we claim as new is—

1. The combination and use of exhaust and pressure-bellows with suction and pressure-reeds, whereby American free reeds may be combined with organ-pipes and French reeds, by the appliances and means set forth.

2. Exhaust and pressure-bellows arranged and combined as described, to be operated by the same power and use the same wind.

3. The exhaust and pressure-feeders N, of which the ordinary foot-board forms the top, in combination with the chamber L, divided both longitudinally and transversely into four compartments, for the purpose set forth.

4. The supplemental bellows or reservoir T, to receive wind from the exhaust and pressure-feeders through the pressure-bellows, for the purpose set forth, in combination with the compensating and regulating-valve Y.

5. The exhaust-bellows U, in combination with the pressure and exhaust-feeders N, to supply the American reeds D and equalize the pressure thereon.

6. The yielding stop-spring *x*, for the purpose of enabling the performer to sound additional notes by an extra depression of the key, in the manner set forth.

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WILLIAM JACKSON.

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EDWD. CASHIN.