(No Model.) 3 Sheets—Sheet 1.

# J. W. TRAINER.

## STOP ACTION FOR ORGANS.

No. 474,881. Patented May 17, 1892.

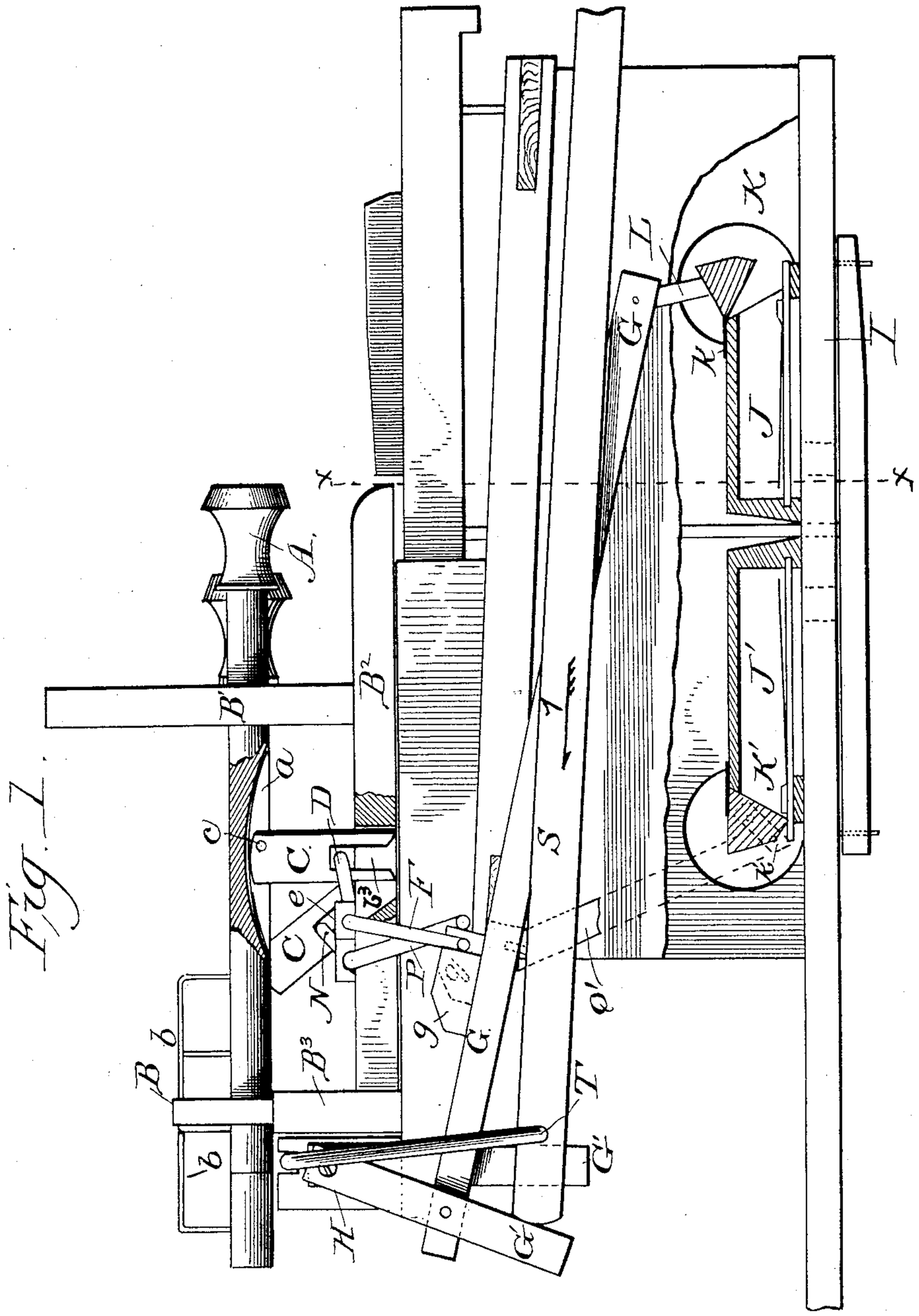


Fig. 1.

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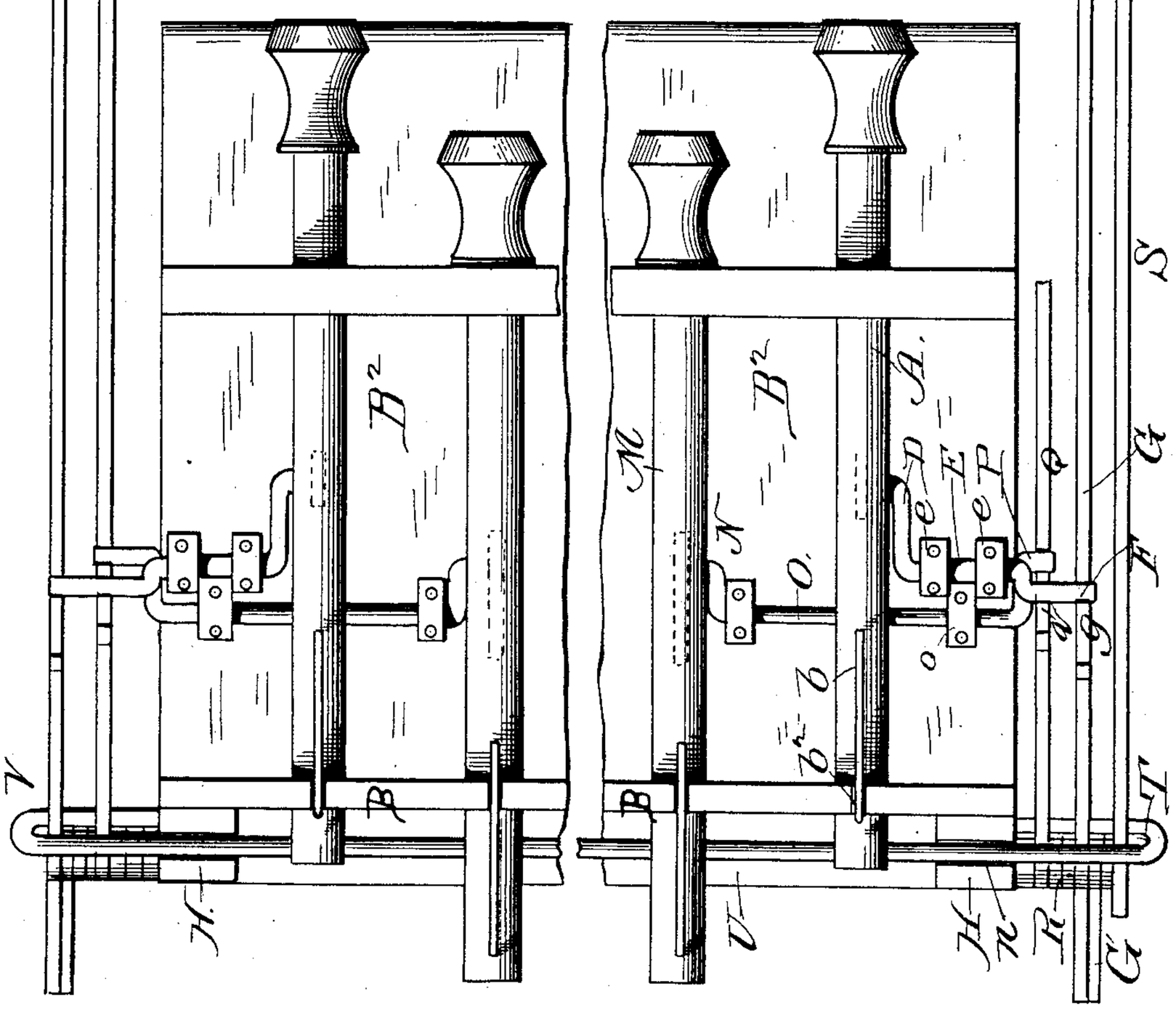
Fig. 2.

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## STOP ACTION FOR ORGANS.

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Fig. 3.

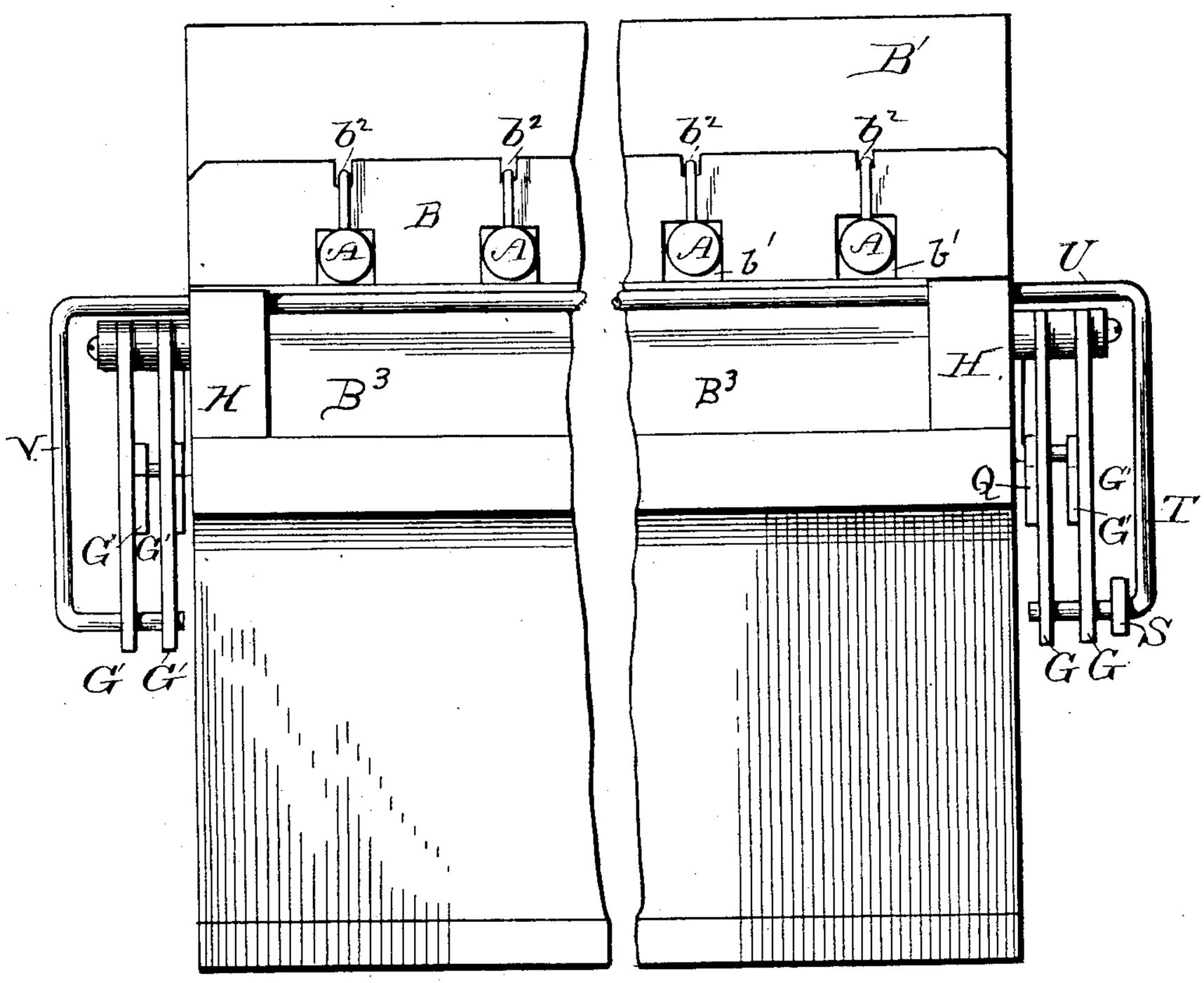



Fig. 4.

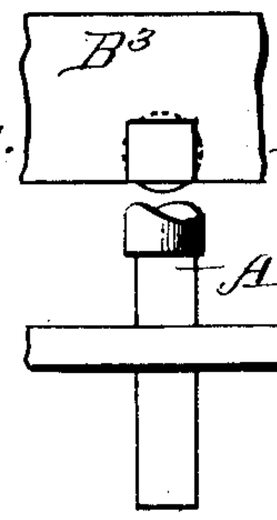
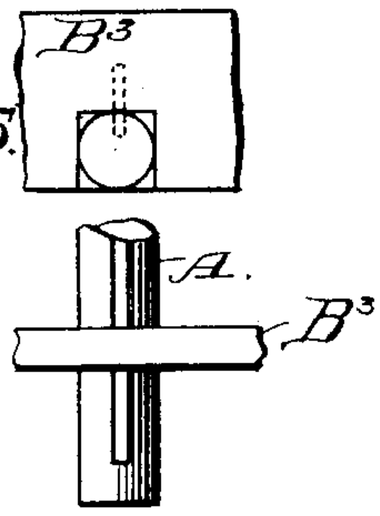



Fig. 5.

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# UNITED STATES PATENT OFFICE.

JOHN W. TRAINER, OF FORT WAYNE, INDIANA, ASSIGNOR TO THE FORT WAYNE ORGAN COMPANY, OF SAME PLACE.

## STOP-ACTION FOR ORGANS.

SPECIFICATION forming part of Letters Patent No. 474,881, dated May 17, 1892.

Application filed October 28, 1891. Serial No. 410,063. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN W. TRAINER, a citizen of the United States, residing at Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Stop-Actions for Organs, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a side elevation of so much of an organ as is necessary to illustrate my invention, parts of the casing and wall of the exhaust-chamber or air-chamber being removed. Fig. 2 is a top or plan view of that part of Fig. 1 which lies at the left of the dotted line *x x*, the central part of the organ being broken out. Fig. 3 is a rear elevation of Fig. 2. Figs. 4 and 5 are details.

This invention relates to a new construction and combination of parts constituting the coupler movements, whereby simplicity and economy of construction, together with convenience in putting together the parts, are attained and ease and certainty of operation are secured.

Like reference-letters refer to like parts in all the figures.

A is a stop-pull of substantially the ordinary construction, except that it is slotted upon its under side, as at *a*. This stop, together with others to be hereinafter referred to, is mounted in upright ribs or narrow boards B B′, which rise from a base $B^2$, the rib B being, however, preferably attached to an intermediate rib or bar $B^3$, which in turn is secured to the base $B^2$. The rib B is provided at its lower edge with a series of seats *b′* for the reception of the inner ends of the pulls, said seats being preferably rectangular in cross-section to facilitate putting the rib into position after the pulls have been inserted into the places which they occupy in the drawings.

C is a tumbler pivoted near one corner, as at *c*, in the slot *a*, so that while the slotted lower end of the link can swing to the right of the position occupied by it in Fig. 1 it cannot swing in an opposite direction because of the engagement of its upper left-hand corner with the bottom wall of the slot.

D E F is a rock-shaft mounted in bearings *e e* upon the base $B^2$, so as to oscillate within certain limits. The crank D is seated in the forked end of the tumbler C, while the crank F at the opposite end of the rock-shaft engages with a lug or other projection *g* upon a link G. The rear end of this last-named link is pivoted to a carrier G′, preferably a lever or pendulum-link, the upper end of which is pivoted to some suitable support. As a support I prefer to use a block or standard H, mounted upon the base $B^2$; but any suitably-shaped bracket or post of wood or metal may be used for this purpose.

I is the upper wall of the air-chamber or exhaust-chamber.

J is a reed-board of any usual or approved construction.

K is a mute hinged at *k*, so as to close the open ends of the reed-cells or to admit air thereto, operating in the customary manner.

L is an arm connecting the mute with the link G.

In the drawings the pull A is shown drawn out with all the rest of the devices in the position which they ordinarily occupy when the mute is wide open. When the parts are in such position, the engagement of the upper left-hand corner of the forked tumbler C with the bottom of the slot *a*, restraining the backward swing of that link, would prevent the pull from being drawn out any farther, these parts being thus adapted to operate as a stop to limit the forward movement of the pull; but to relieve the pivot *c* from the strain which would be thus put upon it I propose to employ a supplemental stop with each pull and have at *b* indicated a simple and useful one in the form of a metal loop, which straddles the rib or bar B, one leg of each loop being inserted in the stop upon either side of the bar.

By an examination of Figs. 2 and 3 it will be seen that the horizontal bar *b* of the loop is seated in a notch $b^2$ in the upper edge of the bar and slides therein, so that the engagement of these parts will prevent the pull from being rotated. Thus the tumbler C is always maintained in a vertical position to properly straddle the crank D without any lateral strain upon the upper end of the link, where it enters the recess *a*. I do not wish to be limited to the use of this loop for restricting

the axial rotation of the pull, because the same end might be accomplished in different ways—as, for instance, by flattening one or more sides of the inner end of the pull where it passes through the rib B, (see Fig. 4,) or by cutting a longitudinal groove in the pull with a pin projecting from the rib into the groove, (see Fig. 5,) in which latter case the wood at the inner end of the groove might be made to engage with the pin and serve as a stop to limit the endwise movement of the pull. The pull M is thrust in and the forked tumbler C connected therewith, having swung into the inclined position, (see Fig. 1,) permitted the crank N to rise, the crank P at the opposite end of its rock-shaft O to swing forward, together with the link Q Q′, the lower end of the arm Q′ of which link is connected to a mute K′ by a link $k'$, which closes the ends of the reed-cells in the reed-board J′. By preference I make this link Q Q′ angular in form, as shown in the drawings, but do not wish to be limited to that form.

By referring to the upper part of Fig. 2 it will be seen that there is a corresponding set of pulls, rock-shafts, and connecting devices at the opposite end of the keyboard, but which need not be described in detail.

It will of course be understood that the mechanism thus far explained is adapted more particularly for the bringing into operation of single sets of reeds by the opening of a single mute with each pull; but under some conditions it is desirable to open a number of mutes simultaneously, particularly when the reeds thus brought into action constitute or belong to the "great organ," commonly so called.

The devices heretofore described are of such construction that part of them are utilized for the purpose of bringing the great organ into action, while part of those devices are left free to move or remain stationary, as the case may be, but without performing any function during such operation, so, also, while part of the devices which are essential to the throwing on of the great organ, and move when the single mutes are being opened or closed, perform no function during that operation.

S is the pull, connected at one end to a crank T of a rock-shaft, the horizontal part U of which is mounted, preferably, in the upper ends of the standards H. The cranks T V of this rock-shaft are in a common plane with their lower ends in front of extensions of the carriers or levers G′, so that when the pull S is thrust in the direction of the arrow 1, Fig. 1, the cranks engage with all of the links G and simultaneously open all of the mutes which are connected therewith. Of course, when the pull S is moved in the opposite direction the cranks T V are withdrawn from contact with the carriers, thus permitting the mutes to be closed by springs, which are not shown, but are commonly used for that purpose in reed-organs, and may be applied in any of the usual or approved plans or styles. It will be understood that when the mutes are being thus simultaneously opened the stops or projections $g$ $q$ are moved rearward, so that the cranks F P may remain in the positions which they respectively occupy when their actuating-pulls and forked links are thrust inward, and under ordinary circumstances the rock-shafts of which cranks F P form part will remain stationary because of their frictional contact with their bearings; but as the lower ends of the tumblers C are forked the rock-shafts can oscillate freely and follow up the movements of the lugs or projections if the relative weight and angular position of the cranks D N are such as to thus move them.

While I prefer to make the cranks T V of about the relative length shown and form the levers G′ with downward extensions, so that the last-mentioned cranks will engage with the levers below the links G Q Q′, yet it is apparent that the relative proportions might be varied without interfering with the principle upon which my invention operates. It will be seen that in placing these devices in working position, the pulls and the forked tumbler carried thereby may be applied after all the other mechanism is in place, and that while the putting in of the pulls and taking them out is facilitated by forming those links with open slots, the same end can be attained, although less conveniently, by making holes in the tumbler in the proper places and then slipping the links over the ends of the cranks. One of the advantages, however, which is incident to the use of the open forked tumblers is the facility with which their slotted ends can be inserted in slots or open spaces $b^3$, (see Fig. 1,) in the base $B^2$, whereby the engagement of the lower ends of the links with the walls of those slots may serve to support said tumblers against undue lateral movement, thus relieving the upper ends of the links and their pivots from strain or cramping.

When the loops $b$ are used, they may be firmly driven into the pulls, and after the other parts are in place the ribs B can be thrust endwise through the entire series of loops, the ribs lying down flat upon the pulls, after which they can be turned up edgewise, as in the drawings, and screwed fast to the intermediate rib or bar $B^3$.

I am aware that similar forked tumblers have been pivoted at their upper ends in the pulls with their lower ends engaging crank-arms, and that loops, similar to those marked $b$, have been employed upon pulls which did not have vibrating links connecting them with the crank-arms; but my construction and arrangement of these devices possesses marked advantages as regards economy of manufacture and convenience over the prior ones. For instance, by making the rib B separable from the bar $B^3$ and forming therein open-bottomed seats I am able to drive all of the loops into the pulls before the parts are put together, which greatly facilitates placing

the stops in proper position, with the forked ends of the tumblers straddling the crank-arms and thrust down into the slots $b^3$. So, also, this enables me to use forked tumblers, which, by straddling the crank-arms, ride thereon, swinging freely in slots $b^3$ without contact with the walls of those slots, thus avoiding the danger of wear or squeaking which would be incident to such engagement. By suspending the links at their rear ends upon the pivoted hangers, which are arranged, each series of two or more, in a common plane, I am enabled to actuate all of the links in a series by means of a single straight horizontal arm of the rock-shaft independently of either of the pulls, and by arranging a similar series at the opposite end of the organ from that shown in Fig. 1 I am enabled to use a rock-shaft having its cranks depending in parallel planes, so that they will engage simultaneously with both series of hangers.

I prefer to designate that part of each hanger which is between its pivoted upper end and the pivot which connects it to the link as the "hanger" when referring to the fact that the distance between those two pivots is about the same as is the length of the crank-arm F, which is actuated by one of the pulls.

While the pivoted carrier G′ is of such length that it projects beyond the link to engage with the crank of the great-organ rock-shaft, it is evident that the mere fact that it is in one and the same piece with the carrier in no manner modifies its function in moving the link, except that its swinging about a pivot, which is nearly coincident with the axis of the crank, insures that there shall be very little rubbing action or friction at the point where the crank engages with the projecting part of the carrier, as will be plainly seen by an examination of Fig. 1, and the same thing is true in great measure of the relationship between the pivotal and working points of the cranks F P. Consequently there is but little wear, friction, or liability to squeak at these engaging points.

What I claim is—

1. A mute, a link pivoted at its front end to the mute, a pivoted hanger at the opposite end of the link, a rock-shaft having a crank engaging at its lower end with the link, a pull, a tumbler connecting the pull with the link, a second rock-shaft having a crank engaging with the pivoted hanger, and means for actuating the second rock-shaft independently of the pull, substantially as described.

2. A series of mutes, a series of links, each pivoted at one end to a mute and at its opposite end to a pivoted hanger, the hanger being in a common plane, and a swinging arm engaging with the series of hangers, substantially as set forth.

3. A series of mutes, a series of links, each pivoted at one end to a mute and at its opposite end to a pivoted hanger, the hanger being in a common plane, a series of rock-shafts arranged side by side and each having a crank engaging at its lower end with one of the links, a rock-shaft having a crank engaging with the series of pivoted hangers, and means for actuating the last-named rock-shaft, substantially as described.

4. A series of mutes at one end of an organ, a series of mutes at the opposite end of the organ, two series of links, each pivoted at one end to a mute, two series of pivoted hangers, each connected to one of the links, pulls for actuating the links each independently of the other, a rock-shaft having a crank engaging with one series of pivoted hangers and a crank engaging with the other series of pivoted hangers, and means for actuating said rock-shaft independently of the pulls which move the mutes separately, substantially as described.

5. The combination, with the rock-shafts, the pulls, and the tumblers pivoted to the pulls and engaging with the rock-shafts, of the loops on the pulls and rib B, provided with the open-bottomed seats for the pulls, substantially as described.

6. The combination, with the rock-shafts, the pulls, and the tumblers pivoted to the pulls and engaging with the rock-shafts, of the loops on the pulls and a removable notched rib adapted to be thrust endwise through the loops into its notched face at a right angle to the plane of the pulls and to be afterward turned upward to receive the horizontal bars of the loops, whereby the loops and the rib serve to prevent rotation of the pulls and to limit their endwise movement, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN W. TRAINER.

Witnesses:

H. H. DOUBLEDAY,

PAUL F. KUHNE.