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Fig. 1. Fig. 2. Fig. 3. Fig. 4a. Fig. 4b. Fig. 5. Fig. 6. Fig. 7. Fig. 8. Fig. 9. Fig. 10.

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ORGAN STOP-ACTION.

998,189.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HENRY M. LOVE, a citizen of the United States, residing at Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Organ Stop-Actions, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to an improved organ stop, and I declare that the following is a full, clear, concise and exact description thereof sufficient to enable one skilled in the art to make and use the same, reference being had to the accompanying drawings in which like letters and numerals refer to like parts throughout.

The invention is illustrated and described as applied to that style of construction in which an organ stop is drawn through the agency of a lever. In some instances the stop is withdrawn by the use of another lever. In the present invention I show the device as applied to a single lever which is used both for drawing and withdrawing the stop.

The drawings disclose a variety of applications of the invention, wherein a single lever is used in connection with one or more stop connections to draw or withdraw the stop.

The purpose of the invention is to provide simple and efficient means by which the stop can be manipulated by the use of a single lever or key and by which an indication may be given of the position of the stop, whether on or off, and I show different means for giving such indication.

In the drawings Figure 1 is a side view of the device showing the stop lever and the piston, with other parts, certain portions being cut away. Fig. 2 is a front view, part of the piston being cut away. Fig. 3 is a view of the piston and part of the stop-lever in position when the stop is drawn. Fig. 4 is a detail view of the groove in the piston. Figs. 4^a, 4^b and 4^c are cross section views on lines $x-x$, $y-y$ and $z-z$ respectively of Fig. 4, while Fig. 4^d is a longitudinal sectional view on the line $m-m$ looking in the direction of the arrow, the arrows in Fig. 4 indicating the direction the head of the dog travels in the grooves, the dotted lines indicating the unseen outline of the farther groove. Fig. 5 is a side view of the lever and piston having a different form of groove

in the latter to adapt it also to withdraw the stop. Figs. 6 and 7 show the device as employed with two pistons, to be connected mechanically with levers or other mechanisms to draw and withdraw the stop. Fig. 8 is a side view of the dog which operates in the groove in the piston. Fig. 9 is a partial view showing a form of indicator or method of showing the position of the stop, and Fig. 10 is a detail of the piston and lever at their connecting point.

Referring to the drawings in detail 1 represents the stop-lever, 2 the front board or casing, 3 a piston or spindle operatively connected to well-known parts for admitting the air to or excluding it from the associated pipes, 4 is a spring normally keeping the piston down and 5 a spring means for normally keeping the stop-lever up. When the lever is pressed down it raises the piston, the lever having fulcrum 8 and draws the stop. The piston is notched as at 6 and a latch 7, spring or weight, is provided to engage the shoulder of the notch and hold the piston up and the stop drawn. On the side of the piston is a loop-like groove 9. The bottom of each side of the loop slopes upwardly, as from a to b where there is a step down to c , thence upward to d where there is another step down to a . Pivotaly mounted on the stop-lever is a dog 10, its end being bent at 11 to travel in the grooves in the direction shown by arrows in Fig. 4, the end of the dog being broken away in Fig. 1 to show the groove, but appearing in Fig. 2. It will be understood that this is a spring-dog so that the head 11 will have a slight pressure into the groove, or a spring may be separately provided. Mounted on the piston or at some other convenient point is a lever 12 one end of which bears against the latch 7 the other end being curved somewhat like the outline of the groove and lying slightly within the outer sides of the groove. Normally the head of dog 10 is at point a at the deeper end of the portion of the groove at the right in Fig. 4. When the lever is pressed down it lifts the piston 3 which is caught by the latch 7 and the stop is held drawn, spring 4 being compressed as shown in Fig. 3. When the lever is released it rises again, by force of spring 5, a distance according to the length of the groove 9, but less than the distance the lever is pushed down to draw the stop, head 11 sliding along the groove past point b and into the de-

pression at *c* where it holds the lever from rising farther but is free to be moved up the left hand part of the groove when the lever is depressed. To withdraw the stop the lever
 5 is pressed down but not necessarily as low as before, the dog 10 traveling in the groove from point *c* to point *d*, its head 11 engaging the end of lever 12; this throws the latch 7 out, when spring 4 at once presses the piston
 10 down and closes the stop, then the stop-lever is released and returns to its normal or up position and the dog head rests at *a*. The curvature of lever 12 is such as to clear the head 11 when at the top end of the groove.
 15 The position of the stop, whether on or off, is shown by the position of the lever, when the devices thus far described are used alone. The length of the slot forbids the lever from returning to its uppermost position so that
 20 the performer can readily perceive the condition by the location of the levers to each other or by reference to adjacent fixed parts. The groove may be lengthened to allow the lever to make complete return when the stop
 25 is drawn and then other means for indicating the condition may be used for example.

The casing 2 is apertured at 13 and a disk or plate 14 is provided to slide in groove 15 while a wire 16 mounted in the piston 3 extends to the disk 14 lifting it as the stop is
 30 drawn to indicate that fact by sight of the disk in the face-board adjacent the stop-lever or key. The disk may be hinged to the face-board and swung up by the wire
 35 16. Other such mechanical means may be employed to show an indicator at a given point adjacent the key, or the indicator may be mounted in the key. Or the position of the stop may be easily indicated by a construction which is shown in Fig. 9. In
 40 Fig. 9 is shown the board 2' with a depending portion 2'' which normally is concealed in the transverse groove 1^a in the stop-lever. The down position of the stop-lever is indicated by dotted lines. The face of part 2''
 45 may be distinctly colored so that a glance will tell the position of the stop, no color being visible if the stop is closed. The advantage of such a compact construction
 50 with a single reciprocating stop-lever will be apparent when the device is applied to organs of more than one manual where certain of the levers can be disposed between the manuals, the size shown in Fig. 9 being
 55 even larger than need be.

If desired, the reciprocation of the stop-lever may be employed to draw and also withdraw the stop, without the use of spring 4 or the like. Such action is illustrated in
 60 Fig. 5. The groove is triangular with bottom sloping upward, from 9^a to 9^b where there is a step, from 9^b upward to 9^c where there is a second step and from 9^c upward to 9^a where there is a step. Suitably mounted
 65 ed to engage the stop-lever end of dog 10

when the inner end of the lever is down is a guide 17 adapted by such contact to control the movement of the other end of the dog. Normally the head of the dog 10 is in step at 9^a. Pressing the lever raises the piston 70 which is engaged by the latch 7. The lever returns a distance, the dog-head passing into step or pocket 9^b. A second pressure on the lever sends the dog-head into step at 9^c, the dog pressing lever 12 which unlocks 75 the latch 7. The force of the spring 5 then returns the lever to normal position the dog-head drawing the piston down, the lower end of the dog contacting with guide 17 at nearly the end of the movement which
 80 throws the dog to one side its head going into pocket 9^a so that the rising of the finger-lever for repeated action will draw the dog-head in the groove from 9^a to 9^b and into the depression at the latter point. 85

It may be desirable to use the device in connection with two pistons and in Figs. 6 and 7 I illustrate how this may be done, the figures showing the different positions taken by the pistons in the operation. This form 90 of the device is not shown with a latch or spring but those parts shown in the other forms may be readily adapted to different conditions. As before, the device is provided with the key lever 1, spring 5 and fulcrum 8 as seen in former figures. The piston is made up of parts shown as 3' and 3'', the former being the opening piston and the latter taking the place of spring 4 to withdraw or close the stop. The groove is partly 100 in each piston. In piston 3' is the depression *a'* corresponding to depression *a* above in which the dog-head rests when the piston is pushed up by the dog-head to the position shown in Fig. 7. In piston 3'' is groove 19 105 with bottom inclined toward the surface from its upper end to point *b'* so that the dog-head, on the return of the lever is carried into pocket or step *b'*. Pressure on the lever then pushes the piston 3'' up into position shown in Fig. 6 after which the return of the lever carries the dog-head in groove 21 which slopes toward the surface to pocket or step *a'* where the dog head rests. 115

Obviously the length of the groove in each style of construction determines the position of the stop-lever after the stop has been put on. If it is less than the distance which the lever moves to draw the stop, the position of the stop lever (being but partly returned) will indicate that the stop is drawn. With either of the forms shown, the other parts, such as the indicator or latch, may be used if desired. 125

At 22 is shown a wedge on the lever to counteract the tendency of the piston to slide or scrape on the lever when the latter is moved.

Having described my invention, what I 130

claim as new and desire to secure by Letters Patent, is:

1. An organ-stop mechanism comprising, in combination, a stop-lever, a piston mounted in connection therewith, the same being grooved, a dog mounted on the lever adapted to travel in the groove, a latch to engage the piston, a lever operated by the dog to disengage the latch, substantially as shown.

2. In an organ-stop mechanism, the combination with a stop-lever and means returning the same after pressure thereon, of a piston, a spring mounted thereon, a latch to engage the piston and a dog mounted on the stop-lever, the said piston being grooved to receive the head of the dog and hold the stop-lever from full return after the drawing of the stop, substantially as shown.

3. In an organ-stop action, the combination with a stop-actuating lever, of a vertically moving grooved piston, a dog mounted on the lever, its other end traveling in the groove, the groove being of less vertical length than the upward travel of the piston, a latch retaining the piston in raised position and means for releasing the latch, substantially as shown.

4. An organ-stop mechanism comprising a spring-pressed stop-lever, a spring-depressed grooved stop-drawing piston bearing on the lever and adapted to be put in stop-drawing position by pressure on the lever, a latch engaging the piston when in drawn position, a dog mounted on the lever having its end adapted to travel in the grooves provided in the piston and a lever releasing the latch by contact of the dog with the lever when the stop-lever is depressed, the said several members being operative to place the stop in drawn position by pressure on the stop-lever, to return the stop-lever toward normal position to the limit fixed by the length of the grooves in the piston, and to release the stop-holding latch upon second pressure upon the stop-lever, substantially as described.

5. An organ-stop mechanism comprising a lever, a reciprocating piston operated by the lever and adapted to draw and withdraw a stop, means limiting the full return of the lever after the drawing of the stop and means to effect the return of the piston and

the full return of the lever upon the second operation of the lever, substantially as shown.

6. An organ-stop mechanism comprising a lever, means connected therewith to draw and withdraw a stop, means preventing the full return of the lever after drawing the stop and withdrawing the stop by a second pressure on the lever, substantially as shown.

7. In an organ-stop action, the combination of a stop-actuating-lever, piston means operatively mounted therewith, a dog mounted on the lever its free end bearing on the piston means, the said means having grooves for the dog with abutments therein whereby the reciprocating of the lever is operative to draw or withdraw a stop by engagement of said dog against such abutments in the groove, substantially as described.

8. An organ-stop mechanism comprising, in combination, a stop-lever, a piston mounted in connection therewith, the same being grooved, a dog mounted on the lever adapted to travel in the groove, a latch to engage the piston, a lever operated by the dog to disengage the latch, and an indicator connected to the piston and projected into view in the drawn condition of the stop, substantially as shown.

9. An organ-stop-mechanism comprising a lever, means operative thereby to draw and withdraw a stop, the said means having grooves therein and the said lever having a dog with its end traveling in the grooves to operate the said means, substantially as shown.

10. An organ stop mechanism comprising a lever, means connected therewith to draw and withdraw a stop, means preventing the full return of the lever after drawing the stop, and means for withdrawing the stop by second pressure on the lever, one of said means having a member projected into the vision of the operator and indicating the position of the several parts, substantially as described.

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

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