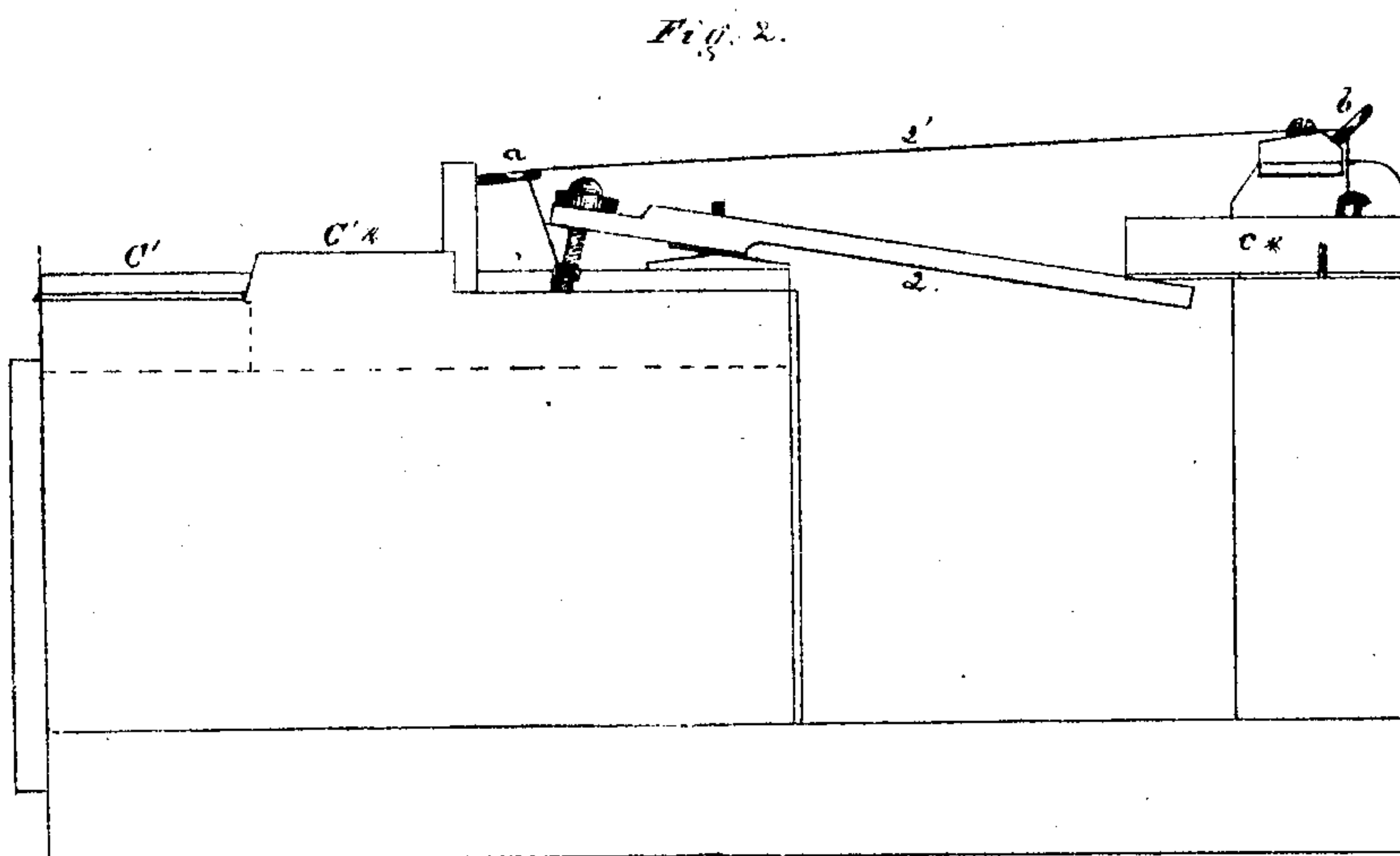
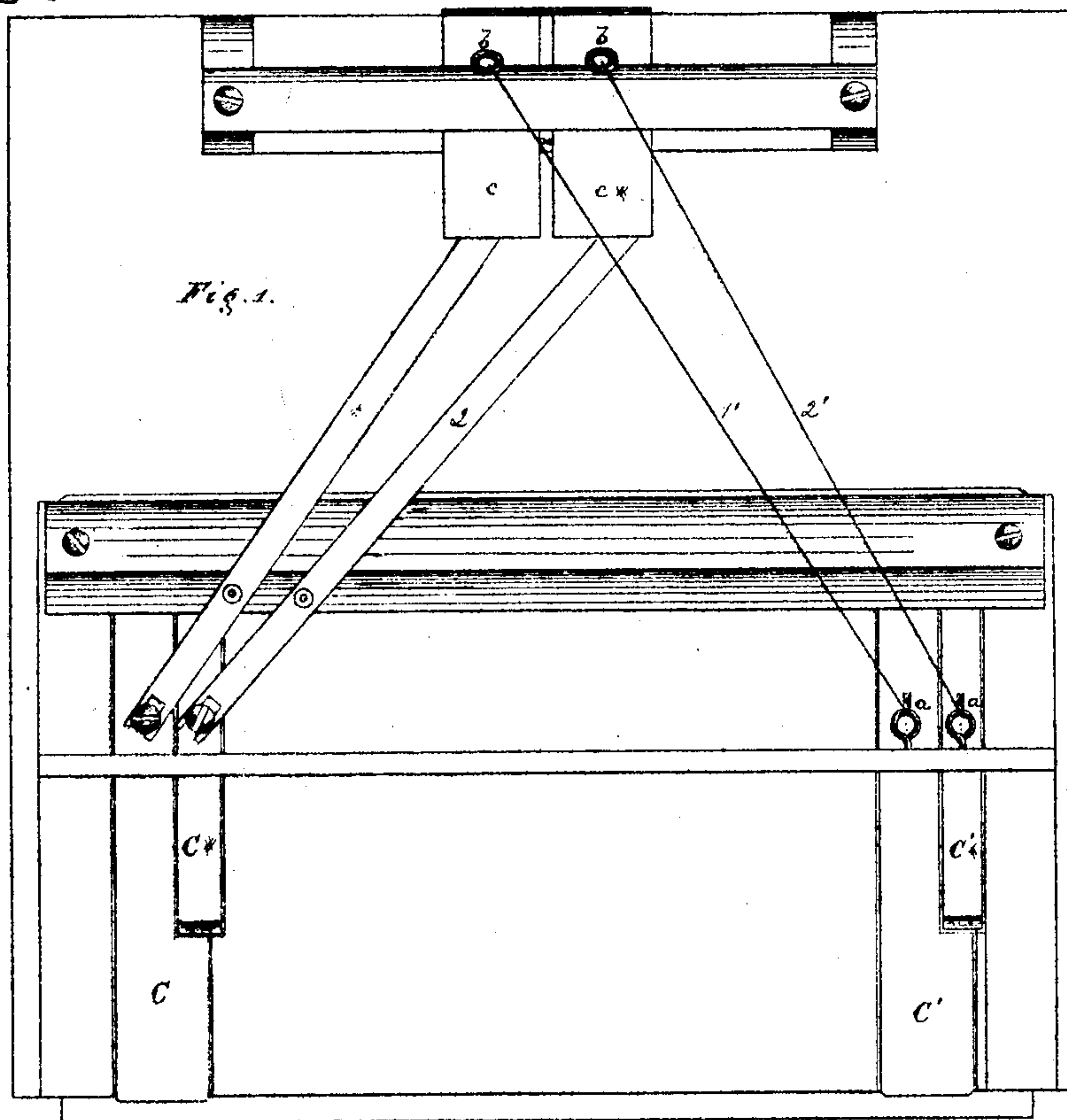


George W. Woodruff.  
117587 *Impt in Organs.*

PATENTED AUG 1 1871



Witnesses.

L. Chaplin.

Ben. A. Cooke.

Inventor.

George W. Woodruff.

by Theo. G. Ellis  
Attorney.

# UNITED STATES PATENT OFFICE.

GEORGE W. WOODRUFF, OF HARTFORD, CONNECTICUT, ASSIGNOR TO JOHN FARRIS, OF SAME PLACE.

## IMPROVEMENT IN ORGANS.

Specification forming part of Letters Patent No. 117,587, dated August 1, 1871.

*To all whom it may concern:*

Be it known that I, GEORGE W. WOODRUFF, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Organs; and I do hereby declare that the following is a full, clear, and exact description thereof, whereby a person skilled in the art can make and use the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

Like letters in the figures indicate the same parts.

My invention consists in a peculiar manner of extending the register of the sub-bass of an organ, by the use of a set of connecting-cords from one or more octaves of the key-board, to open the valves which properly belong to an octave higher or lower, so that the valve for any note of the sub-bass can be opened by pressing down either the ordinary key or its octave above. The object of my invention is to enable the performer to play the sub-bass an octave higher or lower on the key-board, as may be desired.

A patent has already been granted me, dated April 11, 1871, for a similar object, the main feature of my present invention being the substitution of cords for either or both of the sets of levers there described.

Figure 1 is a top view or plan of my improvement. Fig. 2 is an end view of Fig. 1.

C C sharp are the first two keys of an octave on the key-board of an instrument. C' C' sharp are two keys an octave higher on the key-board. c c sharp are the valves for opening the corresponding notes of the sub-bass. 1 2 are levers connecting the two keys C C sharp with the

valves. 1' 2' are two cords connecting the two upper keys with the same valves.

Each key of the lower octave is supposed to have a lever connecting with its valve in the manner shown in the drawing, or in any manner in common use, and each key of the upper octave has a cord connecting with the same set of valves as the octave below. These cords are attached to the key at the proper distance from the fulcrum or support to give the proper lift to the valve, and pass through rings or guides *a* and *b* to give them the proper direction, and are attached to the upper sides of the valves in the right position to lift them when the corresponding key is pressed down. Cords can also be attached to the lower set of keys in place of the levers, if desired. They can also be extended from the same keys to two or more sets of valves. These cords can be made of catgut, wire, or any suitable material.

By means of my invention the whole of the connecting apparatus can be placed above the keys, and can be attached to any instrument already made as well as applied to new ones.

I claim as my invention—

1. The connecting-cords 1' 2', arranged as herein described, for communicating motion from the key-board to the valves.
2. The combination of one set of valves, *c c* sharp, &c., with two sets of keys, C C sharp, &c., and C' C' sharp, &c., on the same key-board by means of the cords 1' 2', &c., and the levers 1 2, &c., substantially as herein described.

GEORGE W. WOODRUFF.

Witnesses:

THEO. G. ELLIS,  
L. HAFELIN.