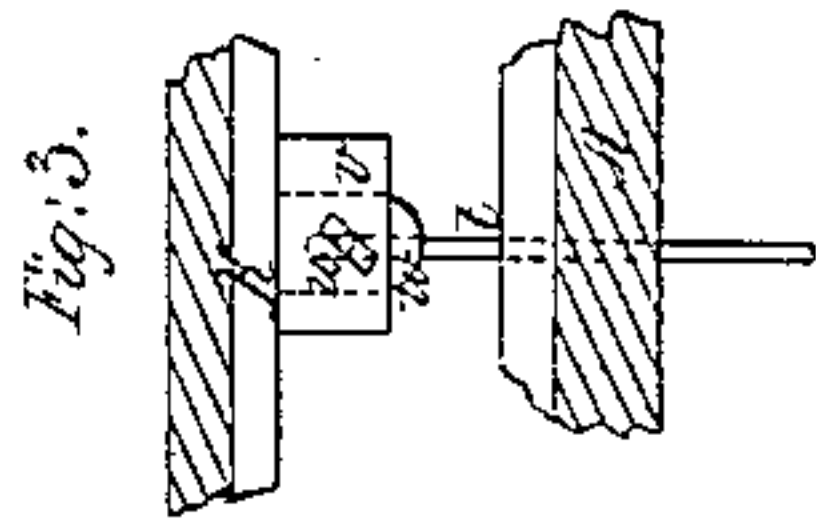
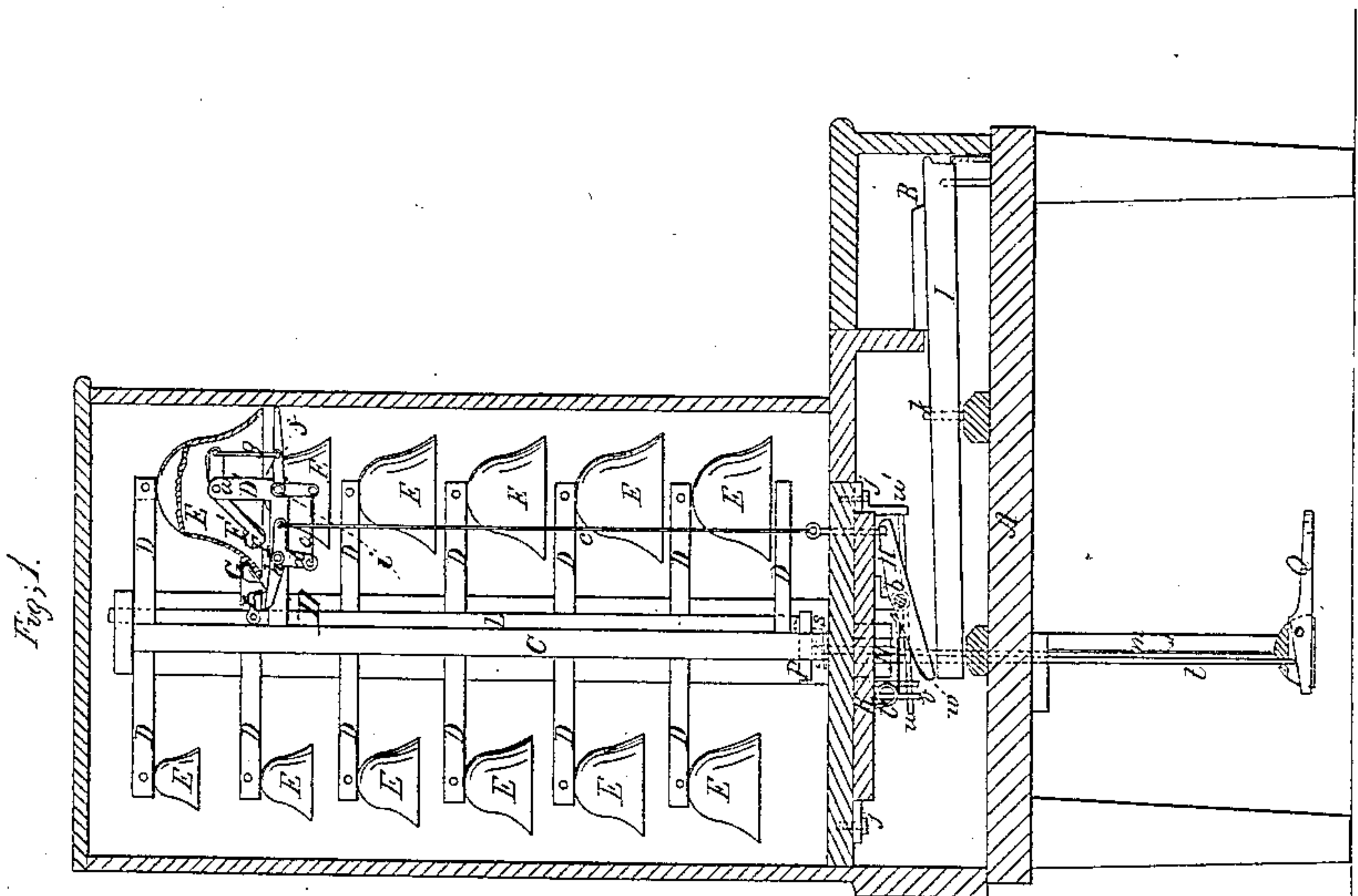
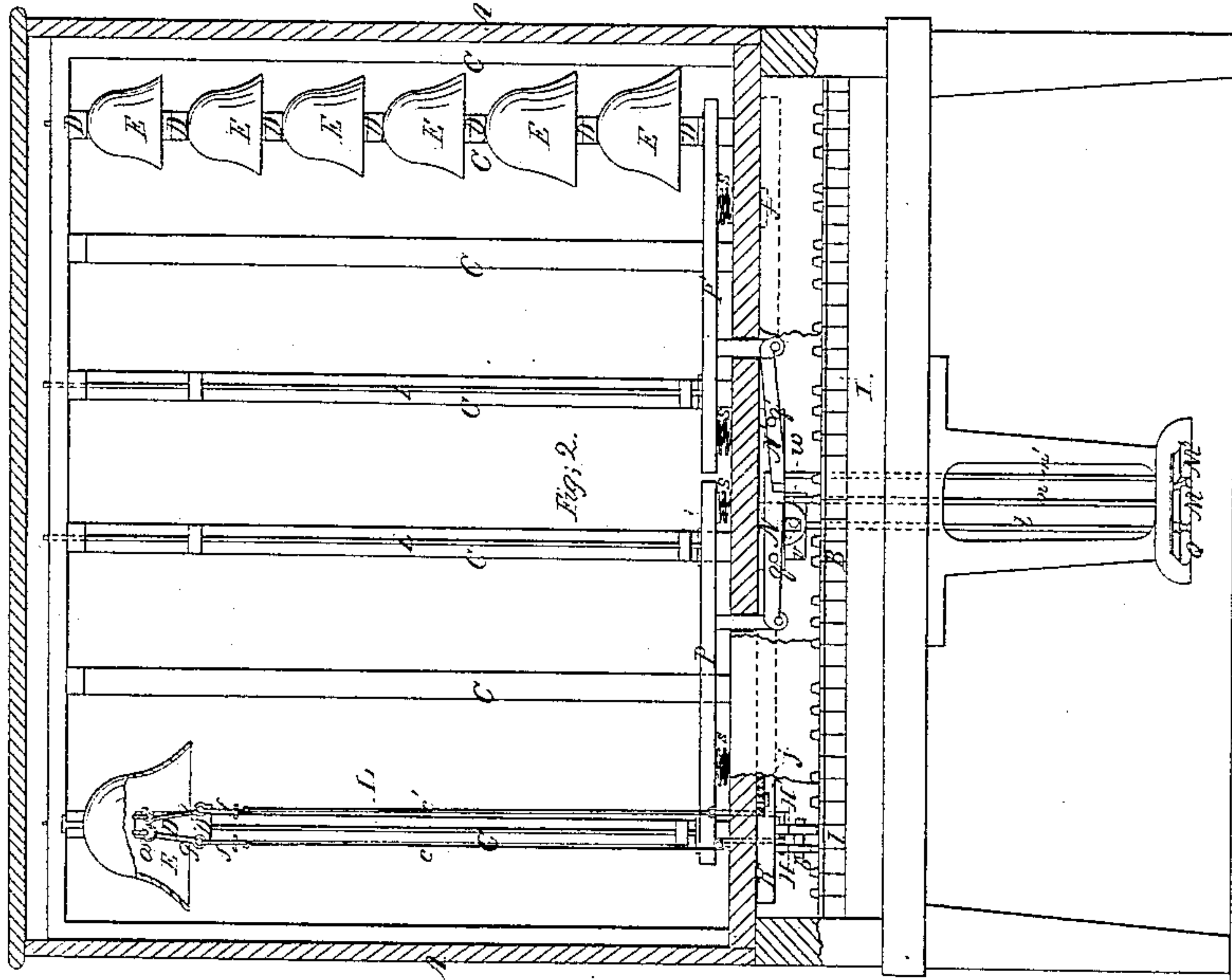


*Williams & Falconnet,*

*Musical Instrument,*

*Nº 33,372,*

*Patented Sept. 24, 1861.*



*Witnesses.*  
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# UNITED STATES PATENT OFFICE.

CLARENDON WILLIAMS AND E. F. FALCONNET, OF NASHVILLE, TENNESSEE.

## BELL-PIANO.

Specification forming part of Letters Patent No. 33,372, dated September 24, 1861.

*To all whom it may concern:*

Be it known that we, CLARENDON WILLIAMS and E. F. FALCONNET, of Nashville, in the county of Davidson and State of Tennessee, have invented a new Musical Instrument which we term a "Bell-Piano;" and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figures 1 and 2 are vertical sections of the instrument at right angles to each other. Fig. 3 is a back view of a part of the apparatus for shifting the hammer connections.

Similar letters of reference indicate corresponding parts in the several figures.

The instrument which constitutes our invention consists of a set of bells properly tuned and arranged within a case substantially like that of an upright piano-forte, and combined with a system of playing-keys, hammers, and dampers in such manner as to enable the bells to be played upon in substantially the same manner as a piano-forte. The instrument may be combined with a piano, so as to be played with the same or a separate set of keys.

To enable others to make and use our invention, we will proceed to describe it with reference to the drawings.

A is the case of the instrument, resembling somewhat the case of an upright piano-forte, containing the bells and the playing "action," and having in front a key-board B, like that of a piano-forte.

C C are upright posts within the case for supporting the bells E E and their hammers F F' and dampers G, one of such posts being employed for each octave of bells and one for any portion of an octave more than a given number of complete octaves that may be employed in the instrument. These posts, which should preferably be of iron, but which may be of wood, are arranged in a row parallel with the front of the instrument. These posts may be stayed or braced in any suitable or convenient manner to give them the necessary stability. Each of said posts has attached to it a number of arms D D, arranged half in front and half at the back, one above another, for the support of the bells E

E and their hammers F F' and dampers G and parts of the playing mechanism. The bells, which may be of metal or glass, are rigidly secured to the said arms by lugs on the outsides of their crowns. The hammers, of which there are two F F' for each bell—viz., a hard one and a soft one, arranged side by side—have their shanks arranged to work as levers, each pair F F' upon one fixed fulcrum *a*, secured in a short post D', standing upon the outer end of its respective arm D within its respective bell, as shown in Fig. 1 by the representation of one bell in section.

II are the keys, one for each bell, each key serving to operate either of the two hammers F F' of its respective bell and acting upon the hammers through the agency of two jack-levers H H', arranged to work upon a fulcrum *b* below the bells and within the lower part of the case. The two jack-levers for each key and bell are connected by two wires *c c'* with two similar T-shaped or three-armed levers *d*, one arm of each of which is connected by one of two wires *e* with one of two similar elbow-levers *f*, each of which is connected by one of two wires *g* with the shank of one of the two hammers. The levers *d* work on fulera *h*, secured in the arm D below their respective bell, and the levers *f* work on fulera *i*, secured in the same arm. The jack-levers H H' belonging to the whole series of bells and keys are all attached by their fulera *b* to a horizontal board K, which extends nearly the whole length of the case and which is fitted to slide longitudinally on guide-pins *j j* far enough to allow either of the two jacks belonging to each bell to be brought over its respective key and the other one to be out of the way of the key that the several keys may actuate either the hard hammers F or the soft hammers F' for playing forte or piano. To enable the keys to operate upon one jack-lever only without touching the other one, the rear parts of the keys are tapered, so that at their extremities their width is only half what it is in those parts of the keys which fit close together. The keys are made to operate upon the hammers by throwing up the opposite ends of the jack-levers H H' to those which have the wires *c c'* connected with them and so causing the said levers to pull down the said wires and the arms of the T-



levers  $d$  or  $d'$ , to which they are attached, and so cause the said levers by their action on the wires  $e$ , elbow-levers  $f$ , and wires  $g$  to throw up the hammers against the bells. The hammers are so arranged as to fall from the bells by their own weight after striking; but in order to make them fall away more quickly to prevent their interfering with the vibration of the bells springs may be applied to draw them back. The jack-levers have springs  $l$  applied to depress the ends upon which the keys operate as soon as the keys are relieved of the pressure of the fingers of the player. The positions of the jack-levers for operating on the hammers of those bells behind the posts  $C C$  will be the reverse of those represented, which act upon the hammers of the bells in front of the posts.

The dampers  $G$ , one for each bell, are attached to short levers  $r$ , which are pivoted to upright slides  $L L'$ , which are fitted to guide-slots in the arms  $D D$  of the posts  $C C$  and tend to fall upon the bells by their own weight; but they are raised every time their respective keys are struck in playing by the opposite arms of the  $T$ -levers to those with which the wires  $c c'$  are connected.

The dampers are thrown out of operation when it is desired to play fortissimo by means of two foot-pedals  $M M'$  and two levers  $N N'$ , (see Fig. 2,) working on fixed fulcrum-pins  $q q'$ , the pedal  $M$  and lever  $N$  raising only a portion of the dampers—say those belonging to the lower three octaves of bells—and the pedal  $M'$  and lever  $N'$  raising the whole of the dampers. The slides  $L$ , carrying those dampers which are to be operated by the pedal  $M$ , are all connected at their lower ends with a horizontal bar  $P$ , which is connected with the opposite end of the lever  $N$  to that upon which the pedal  $M$  acts through the pedal-rod  $m$ , and all the other slides  $L'$  are similarly connected with a similar bar  $P'$ , which is connected with the lever  $N'$ . The adjacent ends of the levers  $N N'$  are so constructed that  $N$  laps over  $N'$ , and hence when the end of  $N$  is raised by the pressure of the foot upon the pedal it does not interfere with  $N'$ , but causes the bar  $P$  alone and its respective damper-slides  $L'$  to be drawn down; but when the end of  $N'$  is raised it raises the end of  $N$  also, and consequently causes the depression of the bar  $P$  and its respective slides  $L$ , as well as of the bar  $P'$  and its respective slides  $L'$ . The depression of the slides is made to raise the dampers from the bells by forcing the damper-levers  $r$  down into contact with the  $T$ -levers  $d$ . The slides are raised to allow the dampers to come into operation when the pressure of the foot is removed from the pedal by means of springs  $s s$ , applied below the bars  $P P'$ .

The shifting of the board  $K$ , which carries the jack-levers  $H H'$ , to enable the hard or soft hammers to be played with is effected

by means of a pedal  $Q$ , a rod  $t$ , a lever  $u$ , and an obliquely-slotted plate  $v$ , such rod, lever, and plate being represented in Fig. 3 as well as in Figs. 1 and 2. The plate  $v$  is secured to the bottom of the board  $K$ . The front end of the lever  $u$  is secured rigidly to the interior of the case by a hanger  $u'$ , and its rear portion works in a fixed upright slotted guide  $w$  and in the oblique slot of the plate  $v$ . Its lever-like movement is permitted by its elasticity.

The rod  $t$  is placed between the pedal and the lever  $u$ . The pressure of the foot on the pedal causes the rod to raise the rear end of the lever, and the lever being prevented from moving laterally by the guide  $w$  is caused in passing up the oblique slot of the plate  $v$  to move the board to position to bring the hard hammers over the keys. When the pressure of the foot is taken from the pedal, the elasticity of the lever  $u$  causes it to descend the slot in the plate  $v$  and so move the board to a position for the keys to strike the soft hammers, upon which the keys will always operate when there is no pressure of the foot on the pedal.

The pedal  $Q$  and movable board  $K$  and double series of jack-levers and their adjuncts may be employed in connection with a part of the key-board only, instead of with the whole key-board, as represented and described, that the hard hammers may be used throughout a portion of the scale and the soft ones throughout the remainder.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. A musical instrument composed of a set of bells arranged in a number of vertical series side by side within a case of the character herein specified and having combined with them a system of hammers, dampers, and playing-keys. This we claim without reference to any particular arrangement or system of hammers and dampers and their operating mechanism that may be employed.

2. The employment, in combination with an instrument, of a pedal or pedals  $M M'$ , combined with a system of dampers by a system of slides  $L L'$ , in the manner substantially as herein specified.

3. The employment, in combination with the bells or with any number of the same, of a whole or partial double set of hammers  $F F'$  and double set of jack-levers  $H H'$ , the latter attached to a movable board  $K$  or its equivalent, combined with a pedal  $Q$  in such manner as to be movable thereby for the purpose of allowing one or other set of hammers to be played by one set of keys, substantially as herein specified.

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