2 Sheets—Sheet 1.

G. P. ROBERTS.

PIANO-ATTACHMENT.

No. 173,671. Patented Feb. 15, 1876.

Fig. 1.

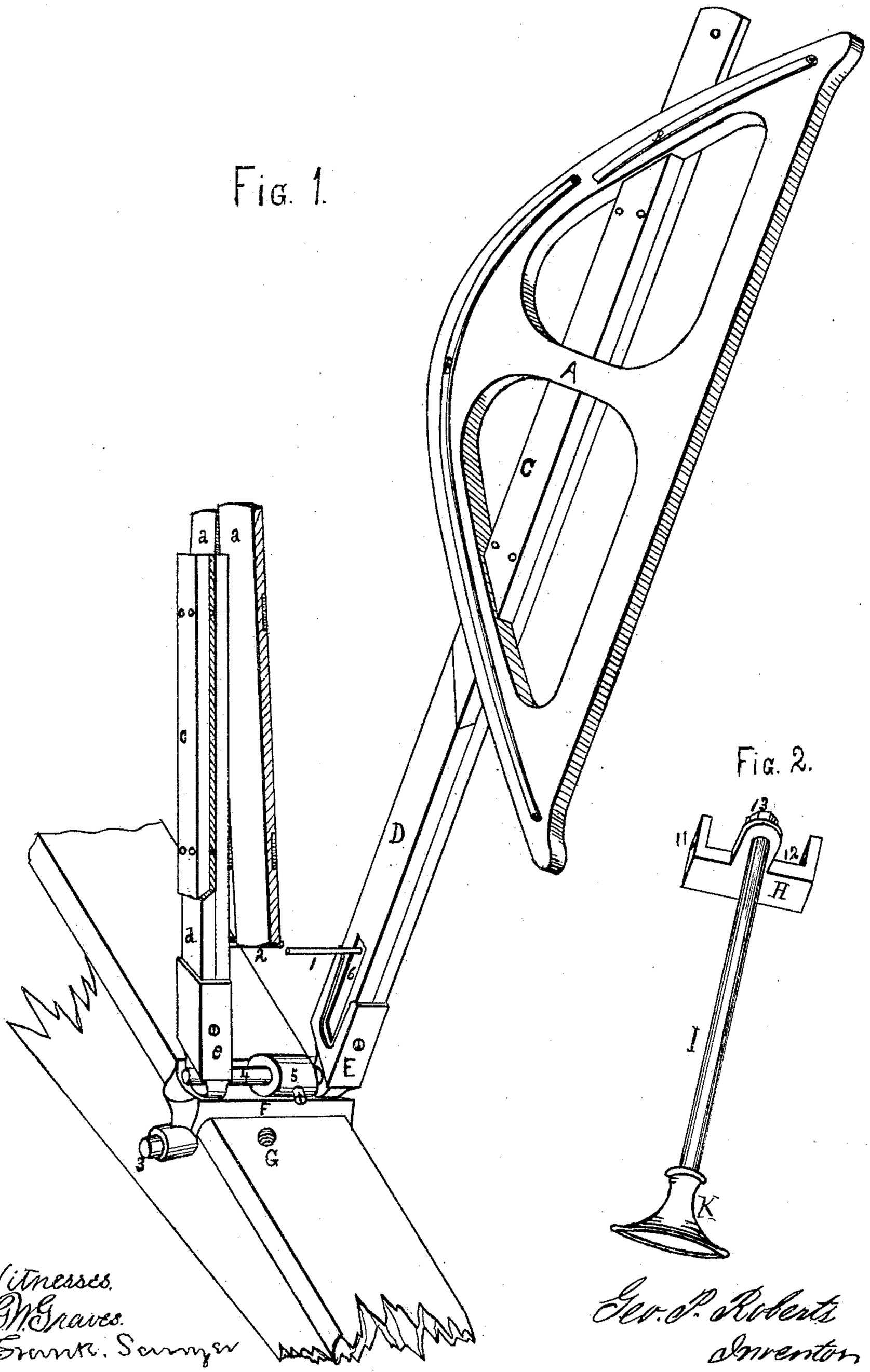

Fig. 2.

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2 Sheets—Sheet 2.

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Fig. 4.

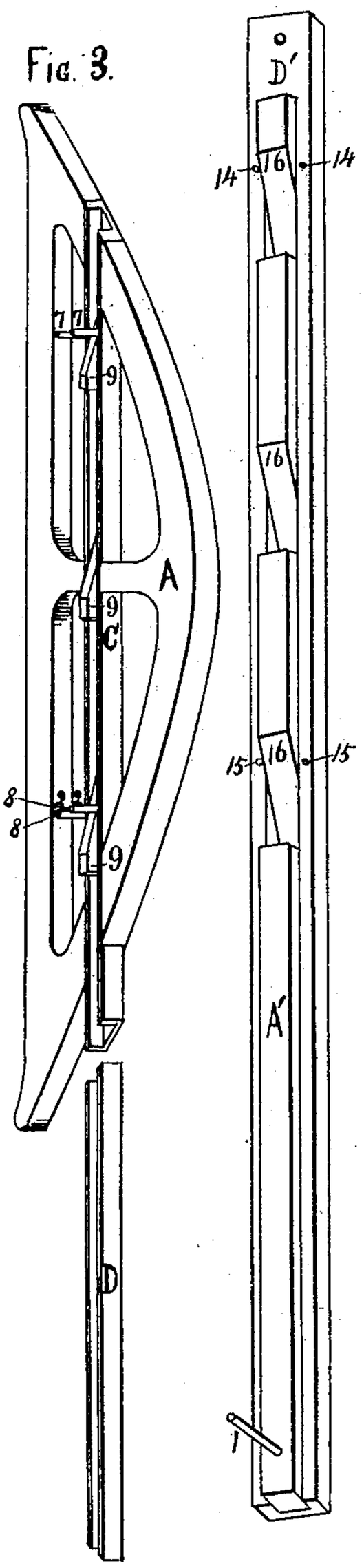


Fig. 3.

Fig. 5.

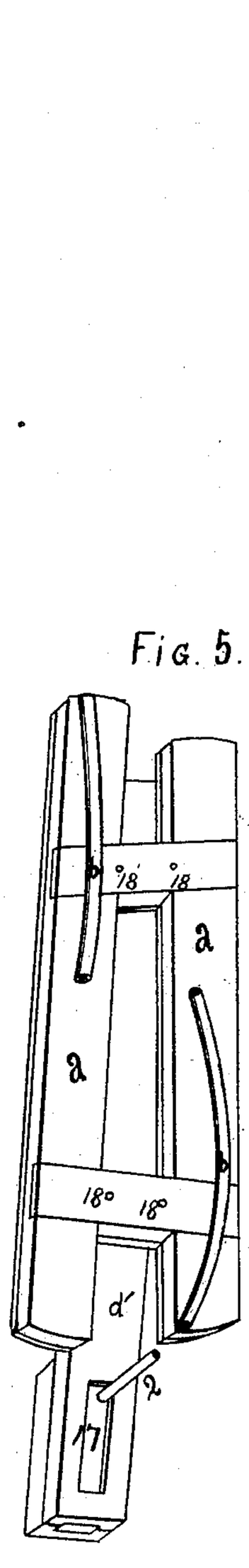


Fig. 6.

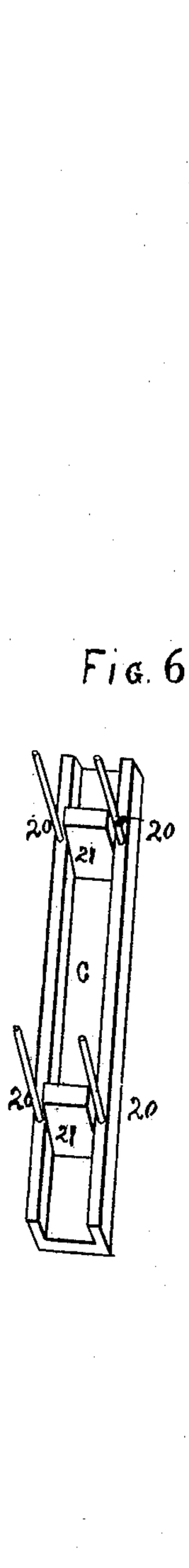
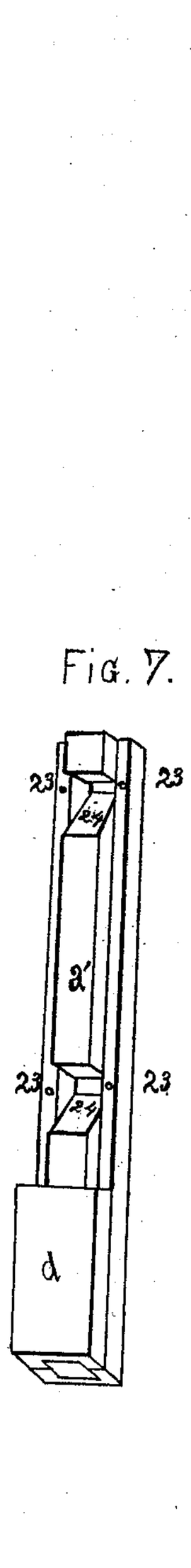


Fig. 7.



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UNITED STATES PATENT OFFICE.

GEORGE P. ROBERTS, OF NORWALK, OHIO.

IMPROVEMENT IN PIANO ATTACHMENTS.

Specification forming part of Letters Patent No. **173,671**, dated February 15, 1876; application filed February 2, 1876.

To all whom it may concern:

Be it known that I, GEORGE P. ROBERTS, of Norwalk, Huron county, State of Ohio, have invented an Improvement in Piano-Forte Attachments; and I do hereby declare the following to be a full and correct description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of my device. Fig. 2 is a view of the coupler and draw; and Figs. 3, 4, 5, 6, and 7 are detailed views of the operative parts.

My invention relates to a device for producing harmonics upon the piano-forte, to be attached to or incorporated into piano-fortes or other stringed instruments, by lightly stopping or damping the strings at some nodal point or points; and it consists in applying to the strings of a piano-forte or other musical instrument a rubber or other flexible tube or hollow rib, forming an air-chamber; and it also consists in the operative mechanism by which said tube is pressed against the strings either from beneath or above, or both, said mechanism being in position to be manipulated by the player by means of a stop or pedal.

In the drawings, A is a stop or damper for the treble, composed of a bridge, carrying air-cushions, suspended between the sounding-board and the treble-strings. *a a* is a stop or damper, in two sections, for the bass or over-strung strings, composed of a bridge and air-cushions, depending over the bass or over-strung strings. B B are the air-cushions for the treble stop or damper, constructed of soft-rubber or other flexible piping, or other hollow rib, forming an air-chamber, which, when brought in contact with the string at a nodal point, will produce distinct harmonics. The air-cushions are rounded or beveled, so that a narrow surface only impinges on the strings.

The air-cushions, if not constructed of round piping, may be constructed in the shape of an inverted letter **V**, with the point slightly rounded, with flanges for attaching, forming an air-chamber to give the necessary elasticity, and may be made in sections, even a section for each string, with the ends either closed or open. The purpose of the air-cushions is to produce harmonics when lightly pressed against the strings at some nodal point or points.

C is a shell, forming part of the box D, and is secured to the stop or damper A. *c* is a shell, forming part of the box *d*. D is a box to receive the sliding arm A′, Fig. 4. The lower part of the box D projects beyond the treble stop or damper A, and is secured to the rim of the sounding-board, to hold the device firmly in its proper position. *d* is a box to receive the sliding arm *a′*, Fig. 7. 1 and 2 are pins in the sliding arms. E and *e* are sockets, with set-screws each, and receive the boxes D and *d*, which are held firmly in position by a wood-screw in each socket. F, Fig. 1, is a clamp for attaching my device to the brace of a piano-forte, operated by a set-screw, 3. 4 is a rod, upon which the sockets E and *e* slide, and are adjusted to position by a set-screw. 5 is a lug, forming part of the brace to receive the rod 4, and provided with a set-screw to hold said rod in place. 6 is a slot in which pin 1 moves. G is an aperture through the brace to the key-front, for the admission of the draw-rod I.

In Fig. 2, H is the coupler, and 11 and 12 are slots, which receive the pins 1 and 2. 13 is a nut that holds the coupler on the rod I, which rod passes through the aperture G, and terminates in the pull K.

Fig. 3 shows the inside of the shell C and the under side of the stop or damper A. C is the shell let into the damper, forming one piece. D is the section of the box shown in Fig. 1. 7 7 and 8 8 are pins. 9, 9, and 9 are inclined planes, to be hereafter referred to.

Fig. 4 shows the lower part of box D, relatively enlarged, and A′ is a sliding arm, which raises the damper or stop A and shell C. 14 and 14 are the sockets for the pins 7 and 7, and 15 and 15 are the sockets for the pins 8 and 8. 16, 16, and 16 are inclined planes, upon which the inclined planes 9, 9, and 9 rise.

Fig. 5 is a view of the stops or dampers *a a* from the under side, and a bottom view of the box *d*. *a a* are the bass stops or dampers, and *b b* are the air-cushions for contact with the bass-strings, similar in construction to B and B for the treble-strings. *d′* is the lower part of the box D. 17 is a slot, in which pin 2 moves, and the holes 18, 18, 18, and 18 receive the pins 20, 20, 20, and 20. (Shown in Fig. 6.)

Fig. 6 is a view of the under side of shell *c* in position. 21 and 21 are inclined planes, and 20, 20, 20, and 20 are pins to slide loosely in the sockets 23, 23, 23, and 23 in Fig. 7, said pins being secured in the apertures 18.

Fig. 7 is a view of box *d*, with the shell *c* removed, and also of a sliding arm, *a'*, similar to sliding arm A'. The sliding arm *a'* raises the shell *c* and the bass stops or dampers *a a*, to which the shell is attached by the pins 20, by means of the inclined planes 24 and 24, on which the inclined planes 21 and 21 rise. 23 are the apertures which permit the shell *c* to rise and fall.

The operation of my invention is as follows: Having formed the stops or dampers A and *a* of a suitable shape to press upon the nodal points of the strings of any piano-forte desired, and having secured my apparatus to the brace of the piano by means of the clamp F and screw 3, and having connected the stop K and coupler H to the pins 1 and 2, the device is prepared to be manipulated. Upon drawing the stop K the sliding arms A' and *a'* are drawn, and the action of the double-inclined planes causes the stops or dampers A and *a* to move toward the strings, bringing the air-cushions in contact with the strings. The delicately-constructed air-cushions B and *b* (they being made of soft rubber or other flexible material, and being made hollow, either as tubes or ribs) touch the strings of the instrument at their nodal points, similar to the fingers of the hand upon the strings of the violin, and produce perfect harmonics upon the piano equal to those produced upon the violin.

We are aware that cushions of other construction have been made, but have not been successful in their results. My cushion, however, constructed of a soft flexible surface and an air-chamber, supersedes all other cushions heretofore constructed, and obviates all difficulties heretofore encountered.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A stop or damper for producing harmonics on a piano-forte or other stringed instrument, having a rubber or other soft flexible surface inclosing an air chamber or space, substantially as described.

2. In combination with the strings of a piano or other instrument, a flexible tube or hollow rib of rubber or other material, forming a soft elastic surface, with an air-chamber, for producing harmonics, substantially as described.

3. In an apparatus for producing harmonics upon the strings of a piano, the combination of a clamp, F, sliding arms A' and *a'*, stops or dampers A and *a*, air-cushions B and *b*, and draw-stop K, substantially as described.

The above specification of my said invention signed and witnessed, at Washington, this 2d day of February, A. D. 1876.

GEO. P. ROBERTS.

Witnesses:

JULIUS SCHERR,

C. M. PARKS.