

(No Model.)

2 Sheets—Sheet 1.

A. J. REYNOLDS.  
RESONATOR FOR ORGANS OR PIANOS.

No. 405,323.

Patented June 18, 1889.

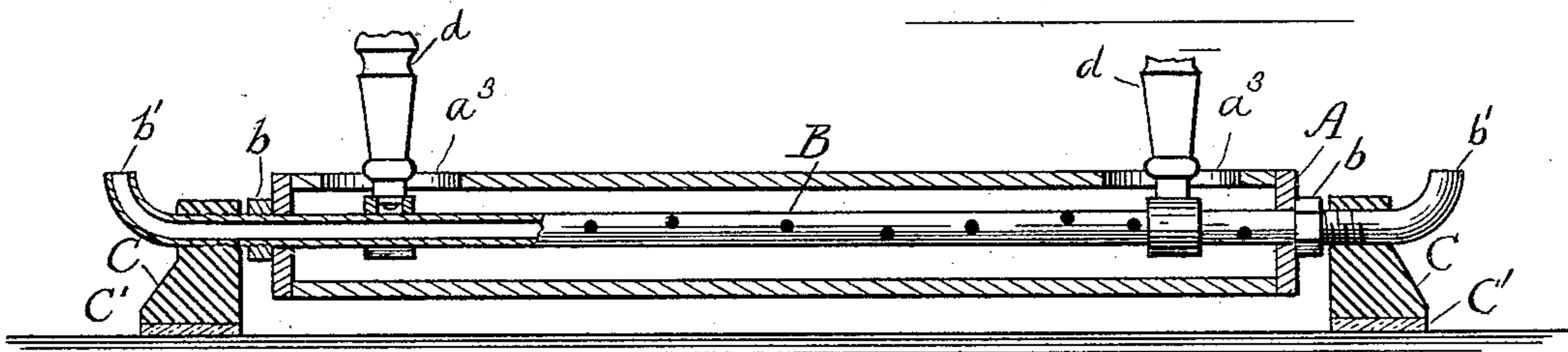
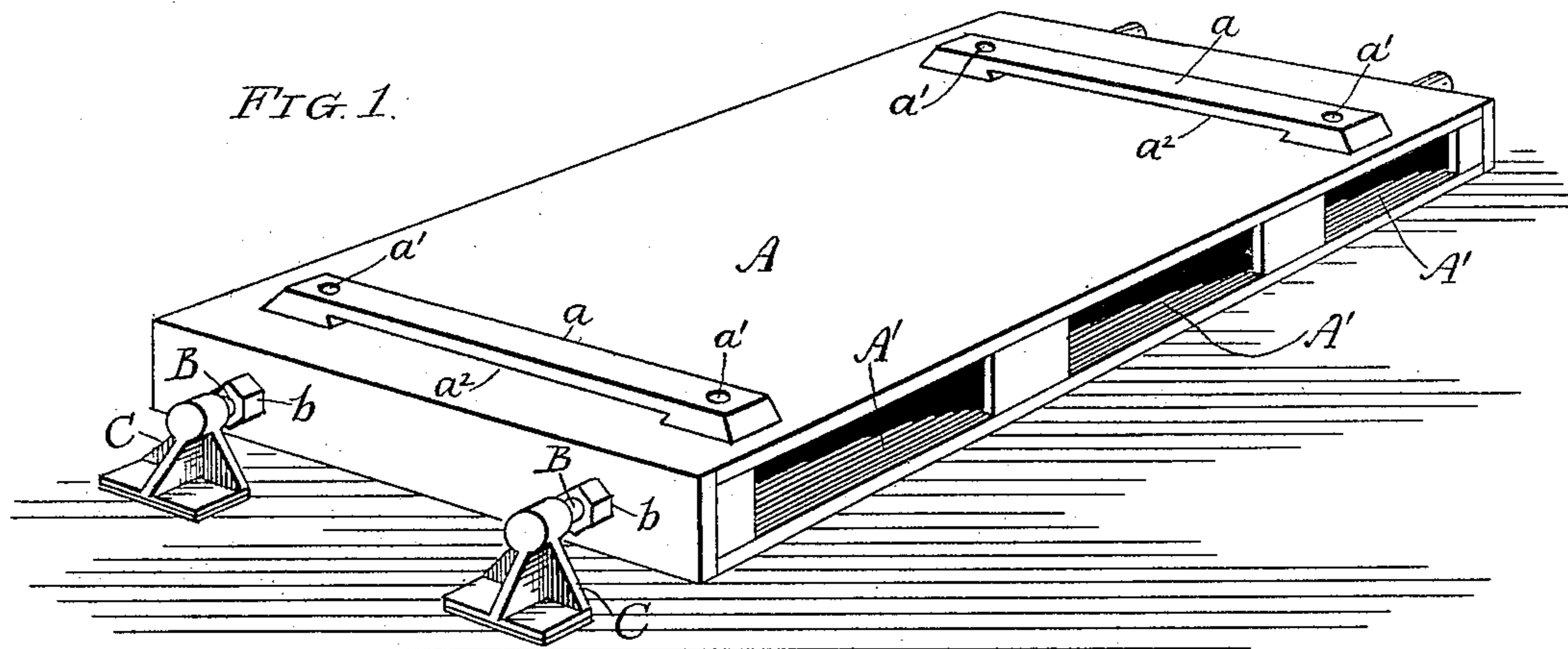


FIG. 2.

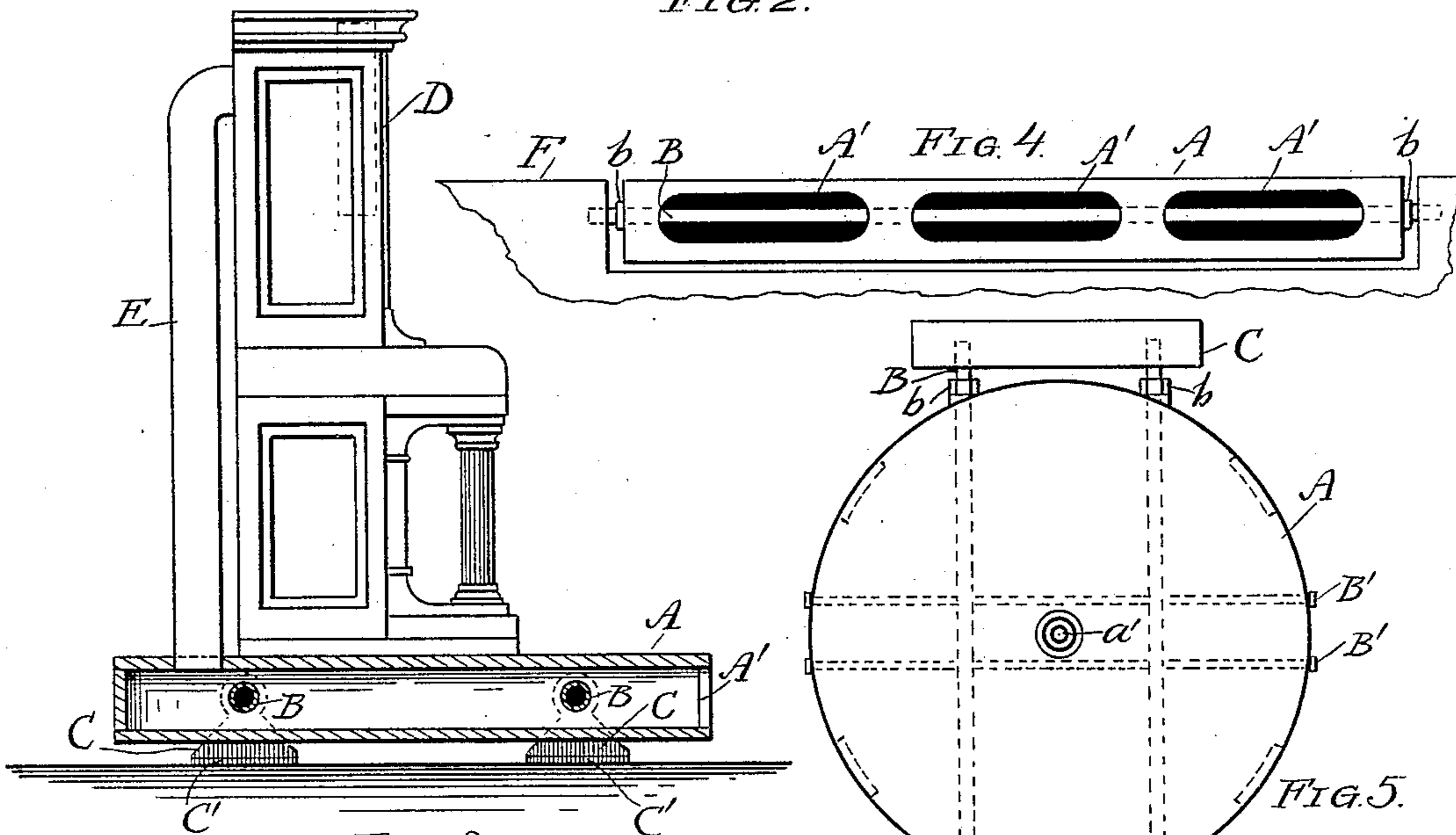


FIG. 3.

Witnesses:  
J. B. Halpenny  
David Strong.

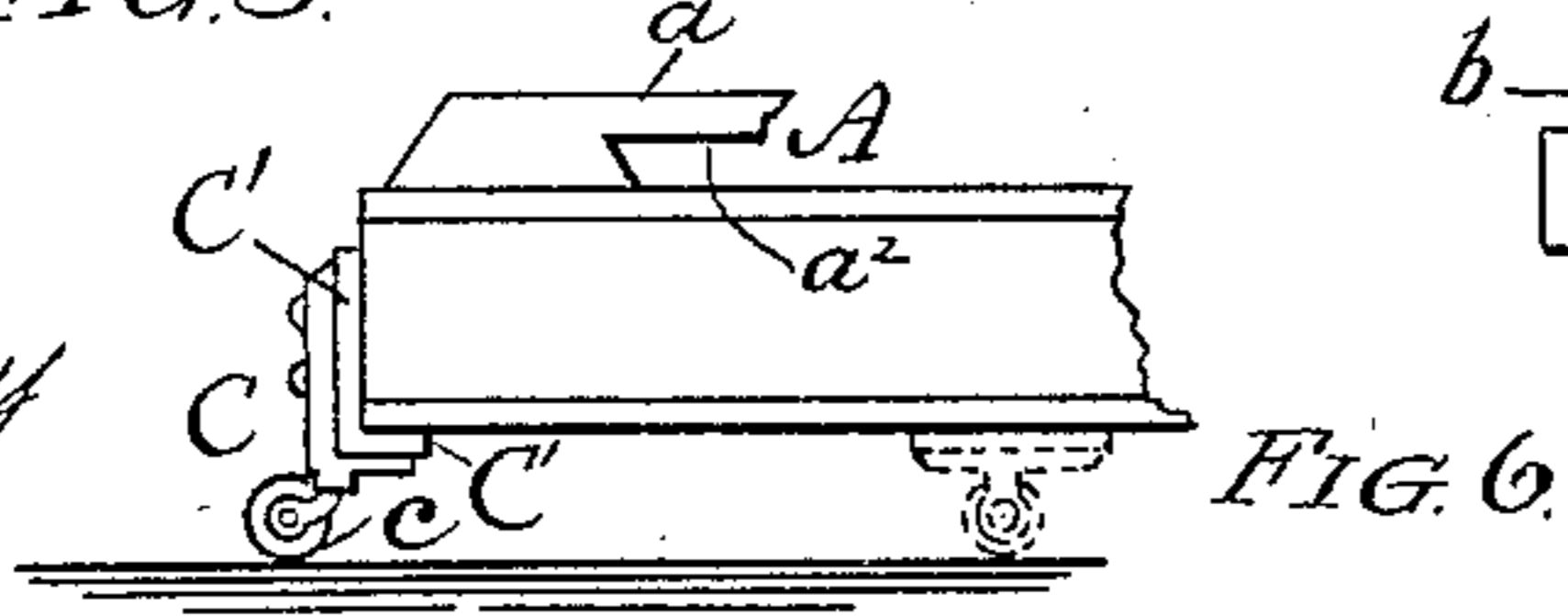


FIG. 6.

Inventor:  
Andrew Jackson Reynolds  
By Bradley & Fletcher  
Attys

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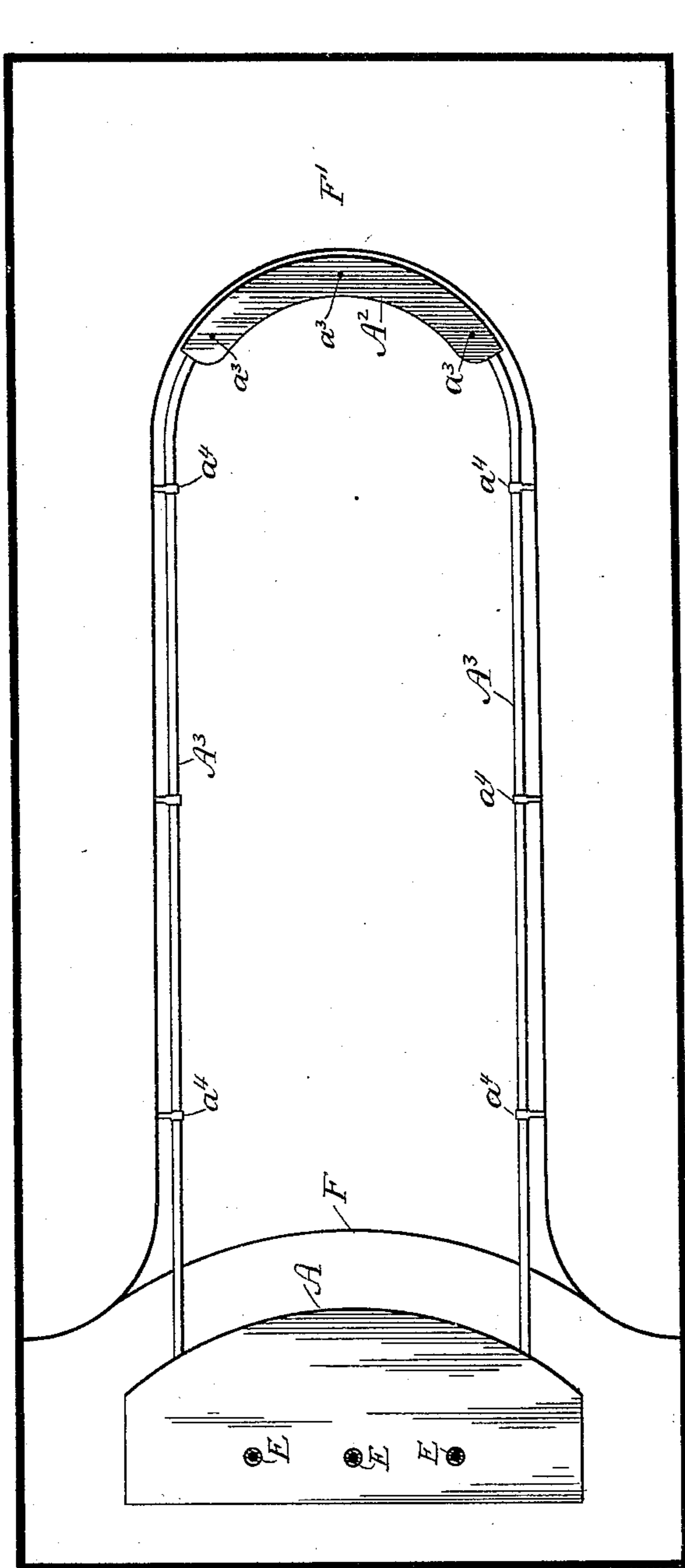
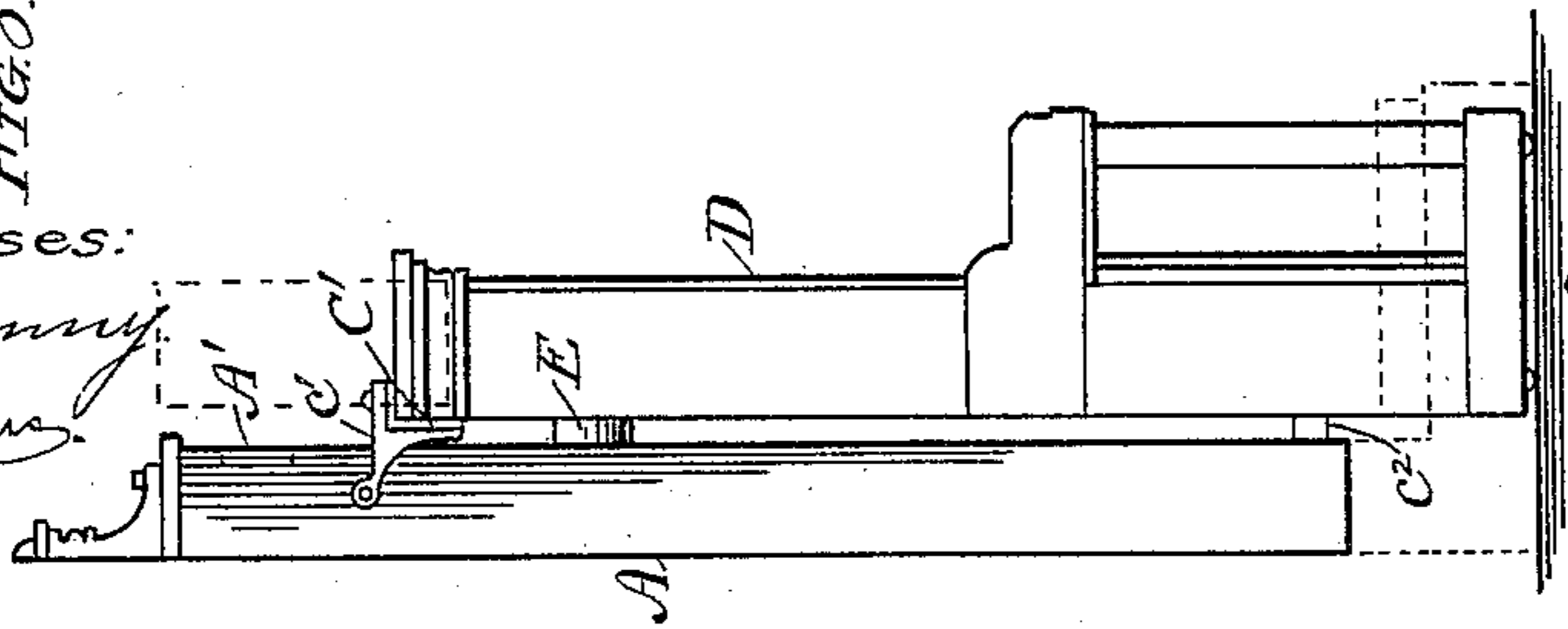


Fig. 8.

Witnesses:  
J. B. Halpenny  
David Stevens



Inventor:  
Andrew Jackson Reynolds,  
By  
Endley & Gilcher  
his Atty.

Fig. 7.

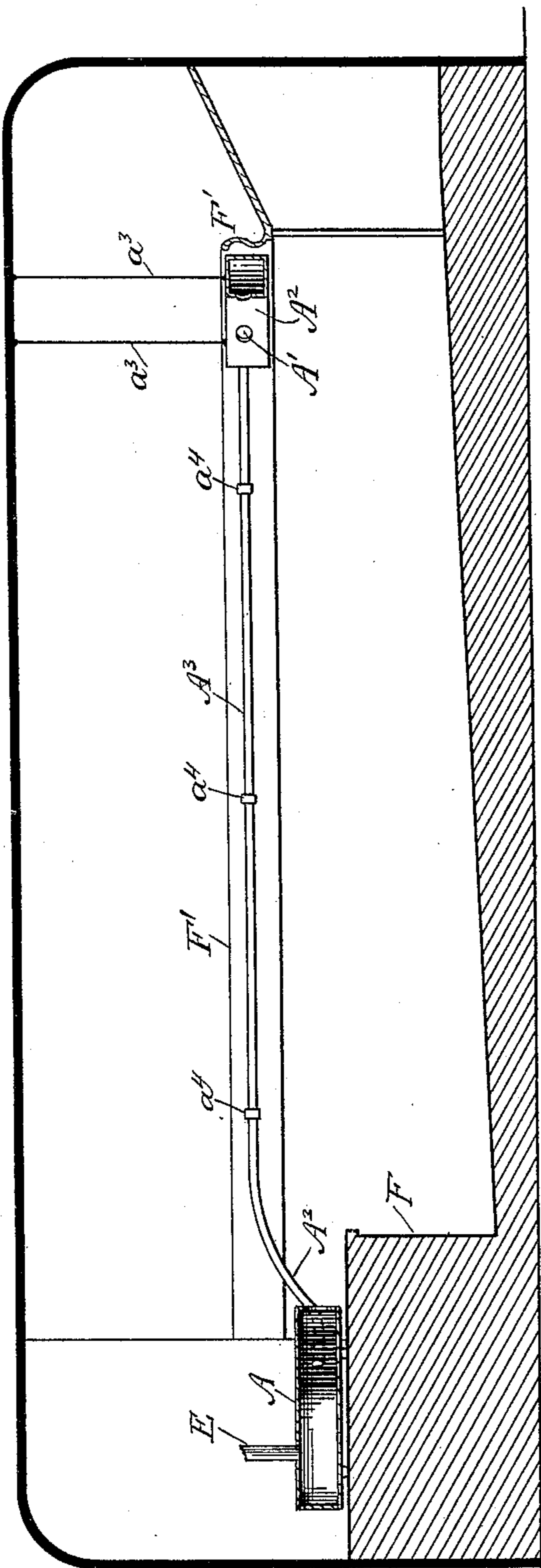


Fig. 9.

# UNITED STATES PATENT OFFICE.

ANDREW JACKSON REYNOLDS, OF PHILADELPHIA, PENNSYLVANIA.

## RESONATOR FOR ORGANS OR PIANOS.

SPECIFICATION forming part of Letters Patent No. 405,323, dated June 18, 1889.

Application filed November 19, 1888. Serial No. 291,234. (No model.)

*To all whom it may concern.*

Be it known that I, ANDREW JACKSON REYNOLDS, of the city and county of Philadelphia and State of Pennsylvania, have invented a new, useful, and Improved Resonator for Pianos, Organs, or other Instruments, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a perspective view of my improved resonator as applicable to the use of pianos or similar musical instruments. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 is a transverse vertical sectional view of the same, showing a piano mounted thereon and a conduit for conveying the sound-vibrations to the interior of said resonator. Fig. 4 is a front view of my improved resonator as applied to the platform of a public hall for the use of speakers, singers, or instruments. Fig. 5 is a modification of said invention as applicable to the use of a bass-viol. Fig. 6 is a detail view of a portion of said device, showing a caster applied thereto to render it portable. Fig. 7 is a side view of a piano, showing said resonator attached to the rear thereof. Fig. 8 is a plan view of a public hall, showing two of said resonators placed at opposite ends of the building and connected with each other; and Fig. 9 is a longitudinal vertical sectional view thereof.

Like letters of reference in the different figures indicate like parts.

The object of my invention is to provide means for amplifying the vocal sounds of public singers or speakers, and particularly the sounds of the various musical instruments—such as pianos, organs, harps, bass-viol, and the like—which are adapted to be used therewith.

To this end my invention consists in the combination of elements hereinafter more particularly described and claimed.

Referring to the drawings, A represents a box, case, or shell, preferably rectangular in form, for ordinary purposes, and which constitutes the body of said resonator. Said shell is constructed of well-seasoned wood of a resonant character—such as spruce, cedar, or pine—and the walls are made as thin as may be consistent with strength and durability.

The joints are carefully formed and firmly secured and glued to prevent jarring or rasping sounds, and thus utilize the full resonance of the wood when in use. In order to permit the walls or sides of said resonator to vibrate, I suspend the same or isolate it from the floor or other parts of the room or building in which it is located. Said suspension may be accomplished in any well-known way which would be likely to suggest itself to one constructing it; but I prefer to make said suspension as follows: Extending through from end to end of said resonator midway between the top and bottom are rods, bars, or tubes B B, of wood or metal, which are preferably hollow and perforated, as shown in Fig. 2, and which are provided with nuts *b b*, which are secured firmly against the ends of the shell, thus retaining the parts under constant strain and insuring a more positive vibration. The ends of the bars or tubes B B are screwed or otherwise rigidly attached to brackets C C, which are provided, preferably, upon the bottom with rubber insulators C' C', which rest directly upon the floor for the purpose of preventing harsh, discordant, or jarring sounds.

If tubes B are employed, as stated, the ends are by preference left open and bent, as shown at *b' b'*, Fig. 2, so that a portion of the sound may escape through them.

Said resonator is provided with openings A' A', preferably in the front, to permit the sound-vibrations to enter the room.

In utilizing said resonator the instrument—such, for example, as a piano or organ—is either placed directly thereon, as shown in Fig. 3, in which D represents the instrument, or the resonator may be attached to the back thereof, or elsewhere, where it may be most convenient and effective. In Fig. 7 I have shown it attached, by means of brackets *c' c'*, or in any convenient way, to the back of the piano. I have also indicated in dotted lines in said figure how the resonator may be made to be placed both beneath and in the rear of the instrument, and in Figs. 3 and 7 I have shown in like manner how it may be located at the top and extended into the instrument or not, as desired. Bars *a*, Figs. 1 and 6, are rigidly attached to the top of the resonator to receive the legs of said instrument when it is placed upon the top thereof, and are

provided with depressions  $a'$ , in which to insert the casters, so that the wood of the resonator and that of the instrument may be in direct contact. Said bars are cut away  
5 beneath, as shown at  $a^2$ , so as to bear only at points near the outer edges of the shell, thereby permitting a free vibration of the walls. Where heavy instruments—such as  
10 pianos—are used, I prefer the arrangement shown in Fig. 7.

Instead of using the blocks  $a$  to support the instrument upon the resonator, openings  $a^3$ , Fig. 2, may be formed in the shell and the legs  $d$  of the instrument inserted therein  
15 and caused to rest directly upon the tubes B, in which case said legs may be notched to straddle said tube, or rests may be formed upon the tube to receive them.

In order to bring the sound-vibrations of  
20 the instrument into more immediate relation with the resonator, I prefer to connect one or more pipes or conduits E, Figs. 3 and 7, with the back of said instrument and the interior of the resonator, in which case the sound-  
25 waves are conveyed directly to the resonator and emerge through the openings  $A'$  greatly amplified.

In Fig. 4 I have shown said resonator in connection with the platform of a public building  
30 for the purpose of amplifying the vocal sounds of speakers or singers or for placing an instrument thereon, as may be desired. The platform F is cut away, as shown, and the resonator A suspended therein, so that its top may  
35 be flush with the floor-surface of the platform. In this construction the brackets C are dispensed with and the resonator suspended directly within the platform, preferably by means of the rods or tubes B, as  
40 shown, or in any other manner which would suggest itself to a mechanic, whereby the body of the resonator would be suspended from direct contact with the platform. It is designed that the speaker or singer shall  
45 stand directly upon the resonator, in which case the vocal sound-vibrations are transmitted directly thereto.

In Fig. 5 I have shown a modification of said invention, in which the body thereof is  
50 made circular, and two sets of rods or tubes B B and B' B' are employed and arranged at right angles to each other. Said form is more especially adapted to be used with a harp or bass-viol, in which latter case the viol-rest is  
55 placed within a socket  $a'$ , formed in a block secured to the top of the resonator. While I prefer to use the cross-bars B, it is obvious that the resonator may be used without them, in which case other means may be employed  
60 for suspending it—such, for example, as the form of bracket C, Fig. 6, which is screwed or bolted to the side of the resonator, as shown, with the insulating material C' intervening. Said bracket may, if preferred, be mounted  
65 upon a caster  $c$ .

I prefer, where practicable, to sink said resonator in the floor of a dwelling, substantially as shown in Fig. 4, in which case the openings  $A'$  may be formed in the top.

In large concert-halls or other public build-  
70 ings it may be found desirable to connect two or more of said resonators in different parts of the building, so that the sound may not only be amplified, but more evenly distributed. I have shown in Figs. 8 and 9 a way of accom-  
75 plishing this result. The main resonator A is connected with the organ or other instrument by means of the pipes E. The supplemental resonator  $A^2$  may be made to conform to the  
80 shape of the gallery F', and suspended from the ceiling or elsewhere by means of the rods  $a^3$ . Pipes  $A^3$ , arranged immediately in front of the gallery and supported upon brackets  
85  $a^4$ , suitably insulated by rubber, felt, or the like, may be employed to connect the resonators with each other for the purpose of conveying the sound-waves. It is obvious that  
90 two resonators—one beneath and one behind a piano or organ—may be connected with each other when great power is required.

My improved resonator may be of any size in proportion to the size of the building in which it is placed and the purpose for which  
95 it is employed. The larger it is made the greater will be the volume of sound emitted, due regard being had to the size and power of the instrument with which it is to be employed.

Having thus described my invention, I claim—  
100

1. The combination, with a musical instrument, of a resonator consisting of a hollow box or shell in operative proximity to the instrument, sound-openings in said resonator,  
105 means for suspending the same from direct contact with the building in which it is placed, and a conduit for collecting and conveying the sound-vibrations from the instrument directly to the interior of said resonator, substantially as shown and described.  
110

2. The combination of a resonator A, a series of cross-bars arranged therein under tension, and suitable brackets or equivalent supports directly connected with said cross-bars,  
115 substantially as shown and described.

3. The combination of the resonator A, a series of hollow cross-bars arranged therein under tension, and means for suspending said  
120 insulator from contact with the building in which it is placed, substantially as described.

In testimony whereof I have signed this specification, in the presence of two subscribing witnesses, this 15th day of October, 1888.

ANDREW JACKSON REYNOLDS.

Witnesses:

D. H. FLETCHER,  
J. B. HALPENNY.