

(No Model.)

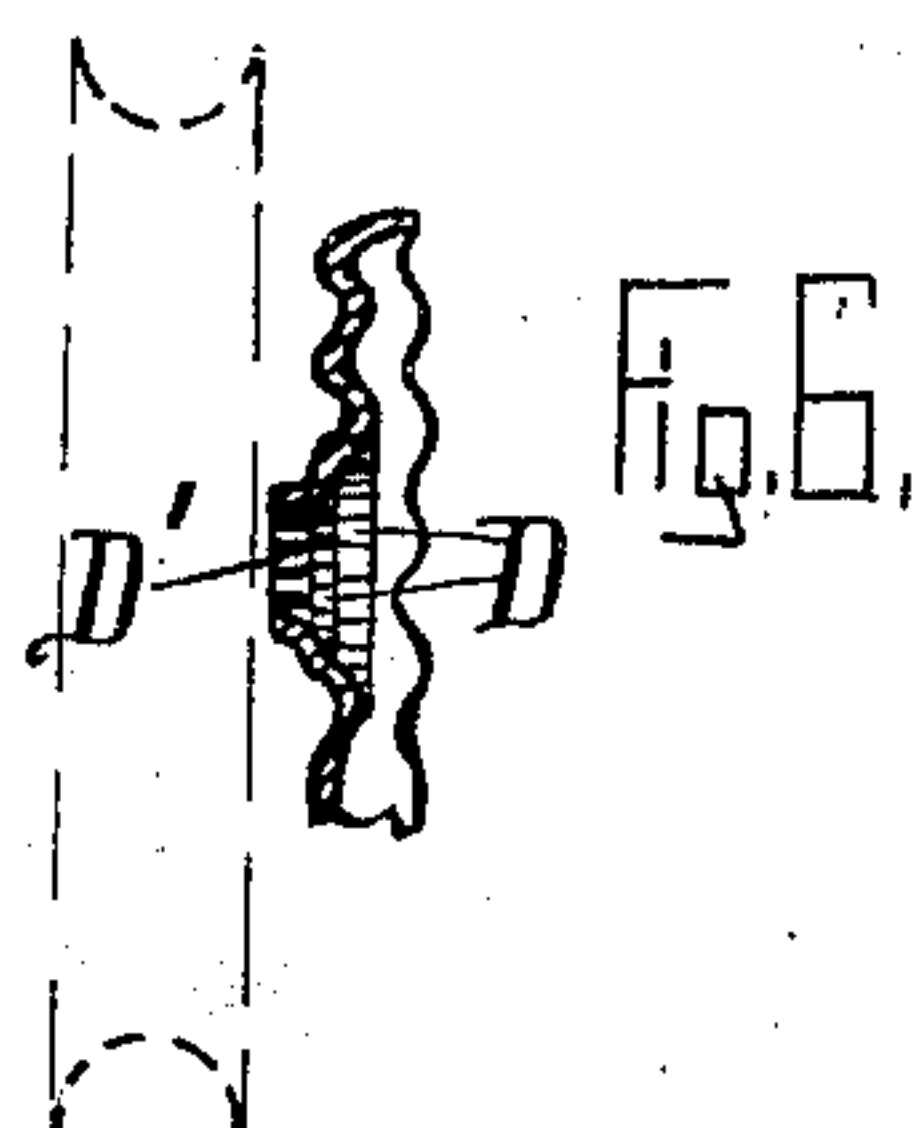
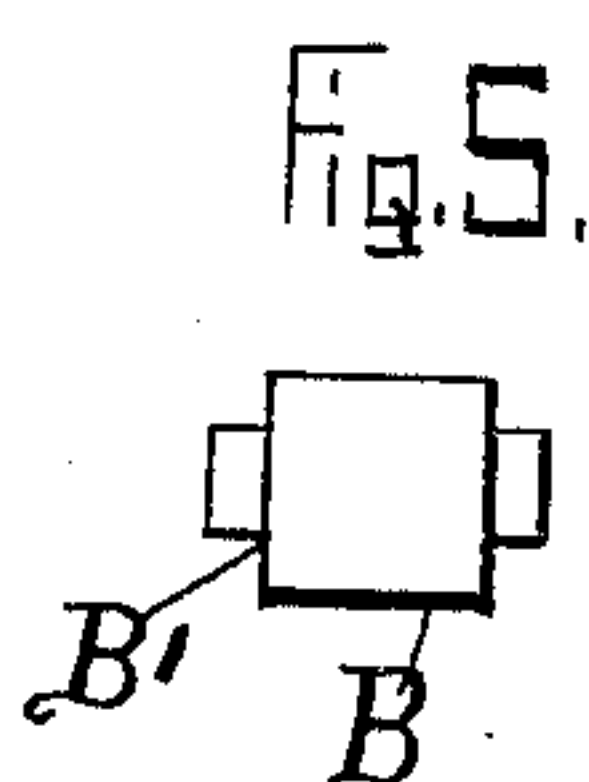
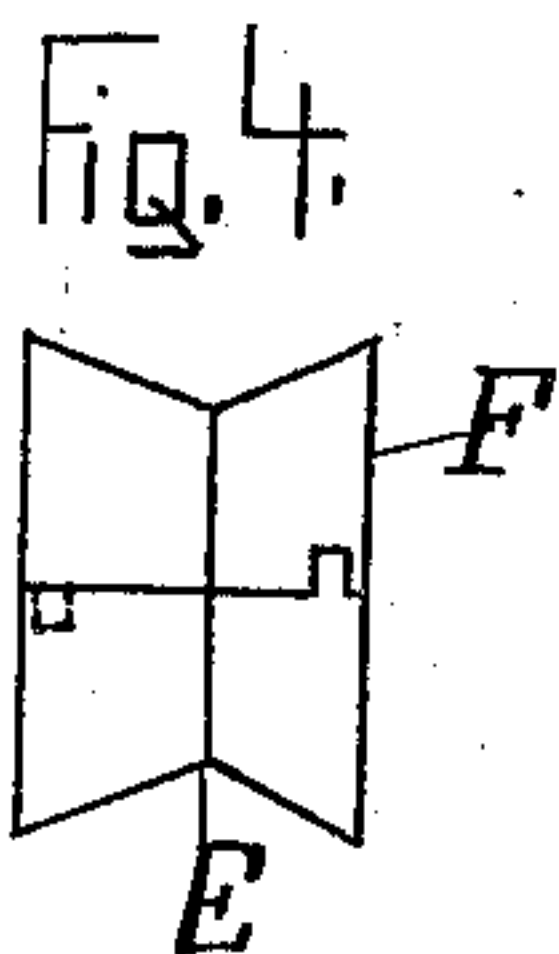
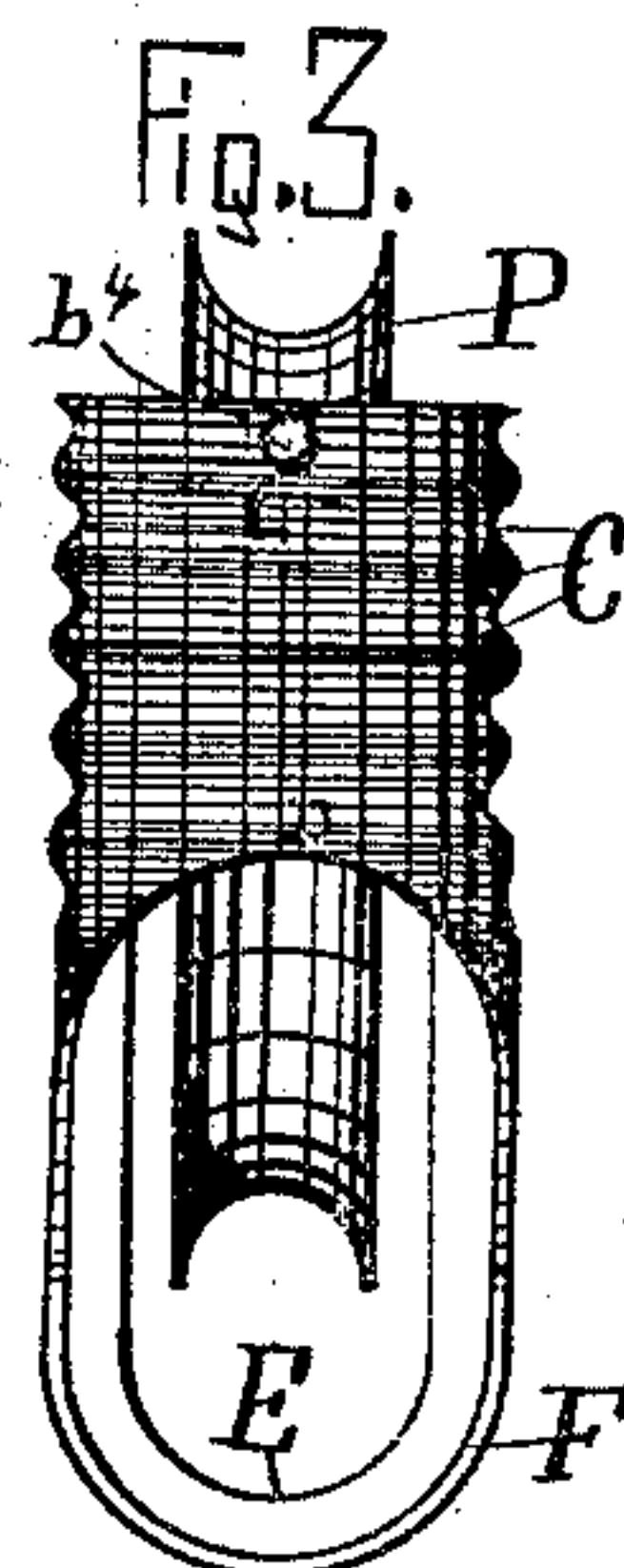
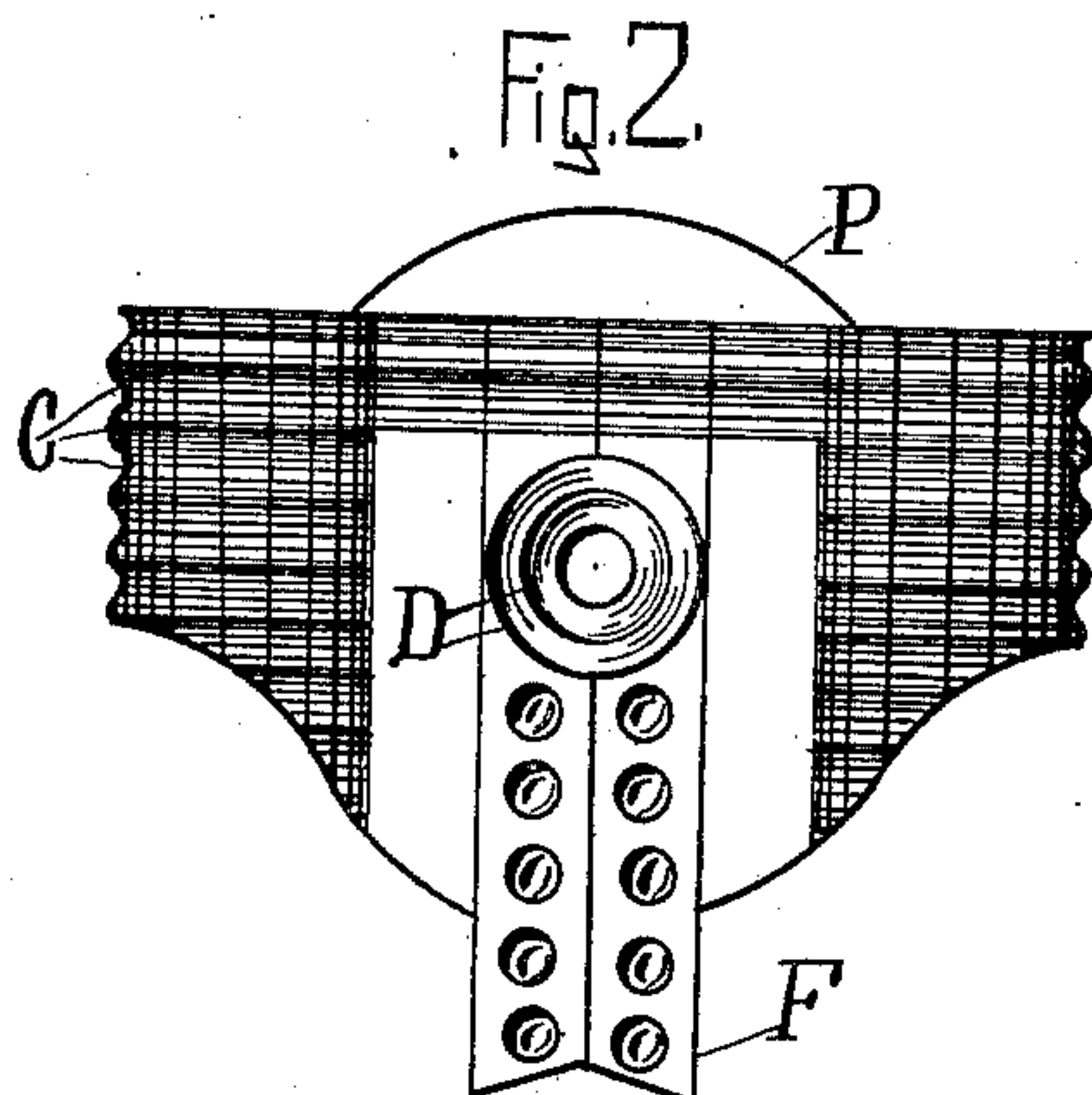
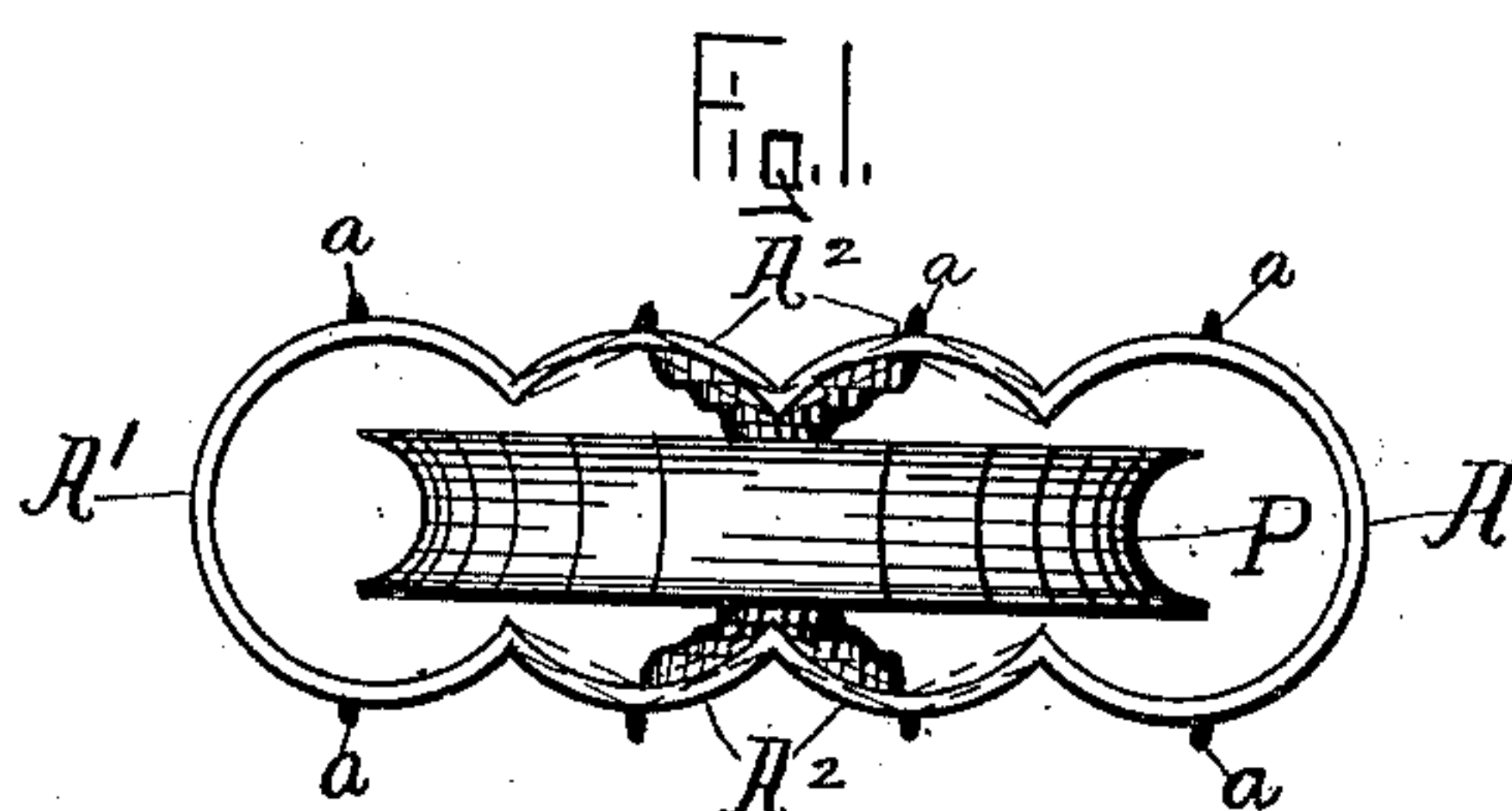
2 Sheets—Sheet 1.

S. PALMER.

MANUFACTURE OF SASH BALANCES.

No. 378,712.

Patented Feb. 28, 1888.



Witnesses

Frank C. Curtis.
Wm. H. Stoddard Jr.

Inventor,
Stephen Palmer
by Geo. Amosby
att'y.

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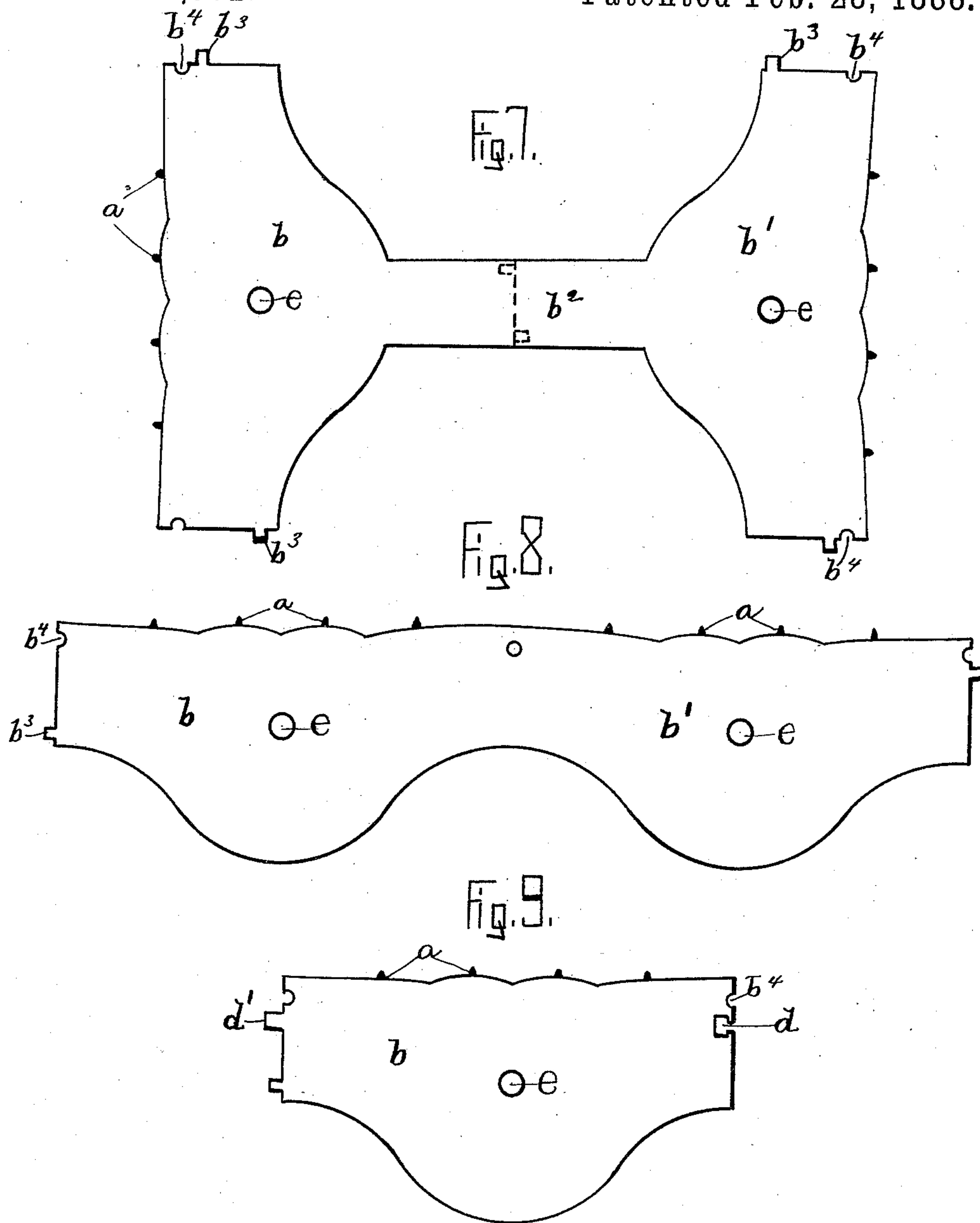
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UNITED STATES PATENT OFFICE.

STEPHEN PALMER, OF LANSINGBURG, NEW YORK.

MANUFACTURE OF SASH-BALANCES.

SPECIFICATION forming part of Letters Patent No. 378,712, dated February 28, 1888.

Application filed November 25, 1887. Serial No. 256,034. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN PALMER, a resident of Lansingburg, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in the Method of Making Sash-Balances; and I do hereby declare that the following is a full, clear, and exact description of the invention, that will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Similar letters refer to similar parts in the several figures therein.

My invention, as hereinafter claimed, relates to an improved method of making sash-balances with sheet-metal cases; and it consists of the novel method hereinafter described, and pointed out in the claims.

Figure 1 of the drawings is a front face view of my improved device in a completed form. Figs. 2, 3, and 4 are respectively side, end, and bottom views of the device as shown in Fig. 1. Fig. 5 is a plan view of the pulley-axle detached. Fig. 6 is a sectional view of a portion of the side wall of the case central of the axle-bearing. Figs. 7, 8, and 9 are modified forms of sheet-metal blanks.

I wish it understood that I hereby reserve the right to make the subject of a future application or applications whatever patentable device or combination of devices I may show or describe herein and not claim.

Sash-balances have been heretofore made with both cast-iron and sheet-metal cases employing either a pulley and cord or a spring. I have shown a cord-pulley revoluble on a fixed axle, though a spring may be fixed to the same axle.

Sash-balances are now made so cheaply that they are shipped in large quantities, generally by the barrel, and when made with cast-metal cases they frequently break, and when made of sheet metal, as heretofore constructed, they are sprung and bent out of shape unless made of metal so heavy as to make them too expensive to profitably manufacture or ship.

As heretofore constructed sheet-metal cases have been made with straight flat sides to fit an elongated mortise with rounded ends, and

were found impracticable for the reasons above stated.

The most approved forms of cases as heretofore constructed have been made of cast-iron only, having end swells either in the body of the case or in the face-plate to fit corresponding auger-holes forming a part of the case-receiving mortise, substantially as described and for the purposes described in United States Letters Patent No. 126,031, issued to Cowell April 23, 1872.

As stated by Cowell, two or more swells or bulges may be employed, and cast-iron pulley-cases having their sides made up entirely of a succession of swells have been somewhat extensively used, and it has been ascertained that if the auger-holes forming the mortise in the window-frame to receive the sash-balance are not bored with extreme care and formed approximately parallel with each other the rigidity of the cast metal will either wholly prevent the insertion of the case or the case will split the window-frame.

I have ascertained that when the cases formed with a succession of swells to fit the auger-holes forming the mortise are made of flexible sheet metal the tubular swells will yield and freely accommodate themselves to the form and direction of the auger-holes without injury to the window-frames, and the cases can be easily, cheaply, and quickly formed from thin flexible sheet metal.

I first cut out from sheet metal blanks of the required shape to form the pulley described. I then swage up the blanks in dies to not only give them the configuration required to produce the tubular swells which fit the auger-holes, but to reduce the flexibility of the metal by producing curved or angular grooves or depressions therein and afford a bearing for the pulley-axle. I then bring the two parts of the blank or blanks forming the sides of the case together, inserting the pulley-axle, on which the pulley is mounted, in its bearings in the sides of the case, and secure the parts in place by fixing the sides upon the ends of the axle, and, when desired, by means of interlocking spurs and notches on the edges of the blanks, as will appear from an inspection of the drawings.

The case shown in Fig. 1 is made from a blank like that shown in Fig. 7, in which

and b' form the two sides of the case, which are connected by the strip b^2 , which forms a strap to strengthen the case and hold the cord upon the pulley. When desired, the blank may be made in two equal parts, as indicated by the dotted line across the strip b^2 . The notches b^4 , one or more on each side, unite to form the hole b^4 , through which a nail may be driven into the window-frame to secure the case in place therein. The projecting spurs b interlock with the opposite sides to keep the vertical edges of the sides in alignment with each other, as shown in Fig. 3. That portion of the blanks forming the sides may be united at one end and the strip b^2 dispensed with when desired, as shown in Fig. 8; or the side pieces may be wholly separated from each other, as shown in Fig. 9, in which I have shown a slot, d , adapted to receive a hook, d' , on the other side blank to secure the blanks together. The apertures e in the blanks, designed to receive the pulley-axle, may be formed when the blank is struck out or may be afterward punched out by a separate operation. The intermediate swells, A^2 , may be curved in the form of an arc, like the end swells, A ; or they may be rectangular, as indicated by the dotted lines in Fig. 1 and as shown by the solid lines in Figs. 2, 3, and 4. When made in the latter form, there is very little possibility of their binding in the auger-holes forming the receiving-mortises; but the outer face of the case preferably retains the form of a series of connected arcs or swells, as shown in Fig. 2, even though the intermediate swells are limited as to their projecting parts to a flange or face-plate adapted to fit into and conceal the auger-holes. The term "tubular swells" may be properly applied to either form.

I have shown in Figs. 2 and 3 a series of grooves, C , extending transversely of the tubular swells, which are formed by the swaging-dies to diminish the flexibility of the metal; but I do not wish to limit the stiffening grooves or ribs to any particular form, shape, or location. They may be in the form of nipples g , struck up from the general surface of the metal, and the term "stiffening-ribs" may be employed to designate the various forms of curved or angular ribs or elevations from the surface of the metal. It should be observed that the ribs and grooves around the axle-aperture in the sides are circular and pushed from the general surface of the sides toward the pulley, as indicated in Fig. 1 and shown in a sectional portion of one side in Fig. 6, finally terminating in an inwardly-projecting annular flange, D' , adapted to receive and afford an extended bearing for the axle B . It is obvious that the circular ribs or grooves may be varied in number and increased so as to extend from end swell to end swell and to the face-plate or flange of the case. The axle may have at each end a shoulder, B' , adapted to form a bearing for the inwardly-projecting edge of the annular flange, and be headed down at its ends to fill the flange and hold the sides

of the case firmly fixed upon the ends of the axle.

The blanks are provided with little spurs a , projecting from their upper edges at proper intervals to project on one or both sides from the central part of the tubular swells, one from each, to serve as marking-spurs to indicate, when pressed upon the window-frame, the proper place and distance apart to bore the holes to form the mortise. I am thus able to produce a sash-balance which is light and durable, easily and cheaply made, and capable of being easily and quickly inserted in a mortise made entirely of auger-holes without danger of breaking or splitting the window-frame.

What I claim as new, and desire to secure by Letters Patent, is—

1. The method herein described of making sash-balance cases, which consists in cutting blanks from ordinary flat sheet metal of commerce, swaging the same into forms or shapes consisting of a series of connected semi-tubular swellings, placing one series of semi-tubular swellings into juxtaposition with another in a position such that one series supplements the other and unites with it to form a sash-balance case composed of connected tubular swells, and then securing the parts in the position described, substantially as described, and for the purposes set forth.

2. The method herein described of making sash-balance cases, which consists in cutting blanks from ordinary flat sheet metal of commerce, swaging the same into forms or shapes consisting of a series of connected semi-tubular swellings, and at the same time forming in the metal bends to produce stiffening-ribs, placing one series of semi-tubular swellings into juxtaposition with another in a position such that one series supplements the other and unites with it to form a sash-balance case composed of connected tubular swells, and then securing the parts in the position described, substantially as described, and for the purposes set forth.

3. The method herein described of making sash-balances, which consists in cutting blanks from ordinary flat sheet metal of commerce, swaging the same into forms or shapes consisting of a series of connected semi-tubular swellings, and at the same time forming in the metal bends to produce stiffening-ribs, placing one series of semi-tubular swellings into juxtaposition with another in a position such that one series supplements the other and unites with it to form a sash-balance case composed of connected tubular swells, and then, after inserting the axle, securing the parts in the position described, substantially as described, and for the purposes set forth.

4. The method herein described of making sash-balance cases, which consists in cutting blanks from ordinary flat sheet metal of commerce and forming a series of marking-spurs along one edge of the blanks, swaging the same into forms or shapes consisting of a series of connected semi-tubular swellings, the mark-

ing-spurs being located centrally of the semi-
tubular swellings, placing one series of semi-
tubular swellings into juxtaposition with an-
other in a position such that one series sup-
5 plements the other and unites with it to form
a sash-balance case composed of connected
tubular swells, and then securing the parts in
the position described, substantially as de-
scribed, and for the purposes set forth.

In testimony whereof I have hereunto set my 10
hand this 23d day of November, 1887.

STEPHEN PALMER.

Witnesses:

GEO. A. MOSHER,
W. H. HOLLISTER, Jr.