

No. 635,608.

Patented Oct. 24, 1899.

J. A. STEWARD.  
SEAMING SHEET METAL VESSELS.

(Application filed Mar. 3, 1899.)

(No Model.)

Fig. 1.

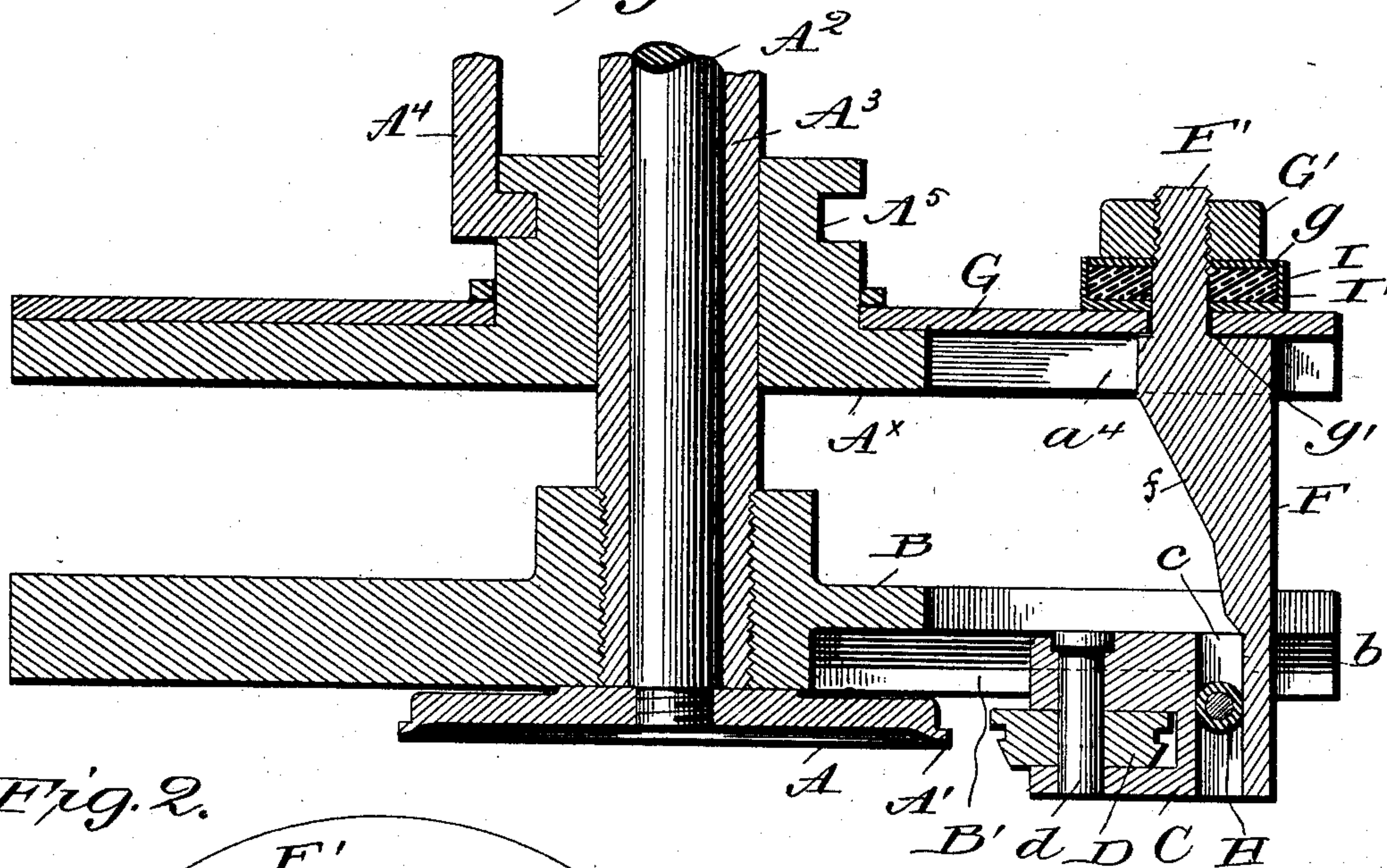


Fig. 2.

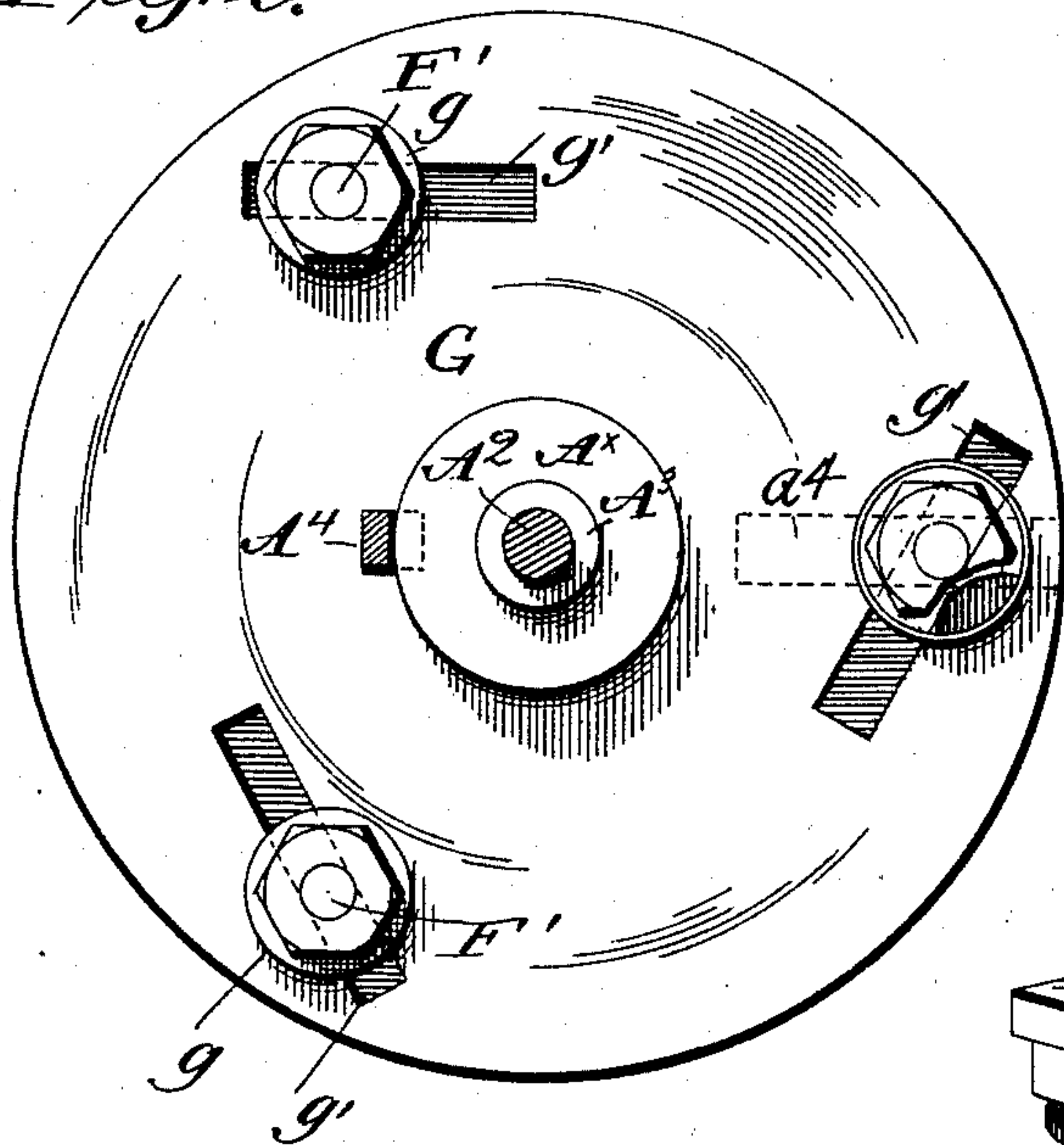


Fig. 3.

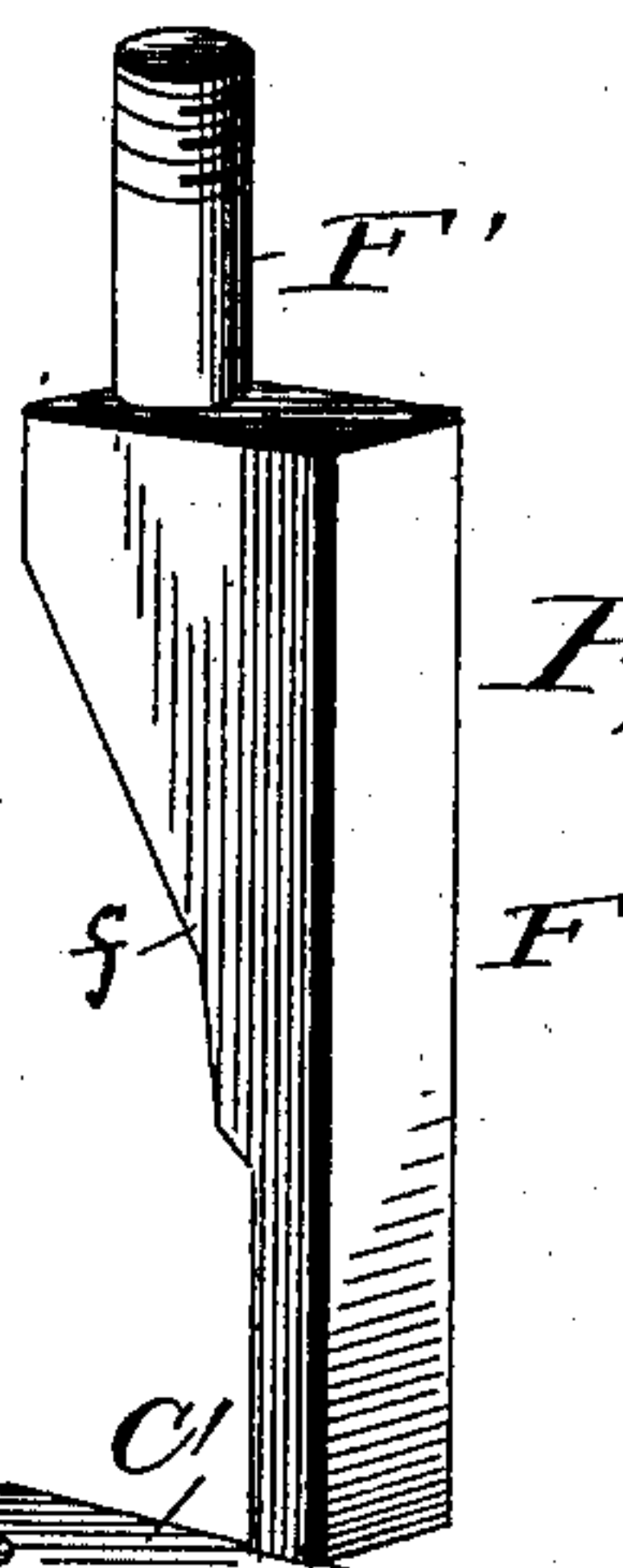


Fig. 4.

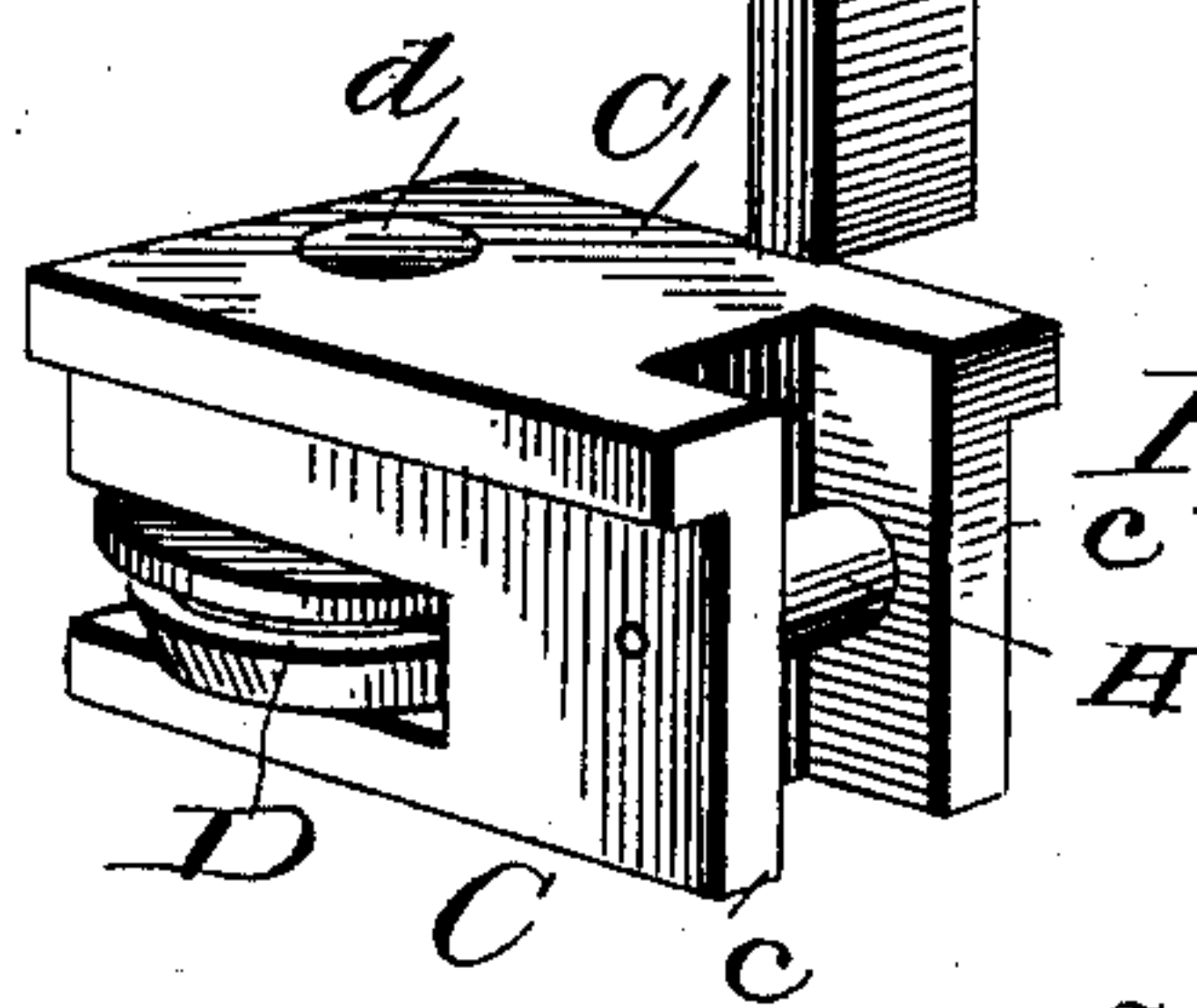
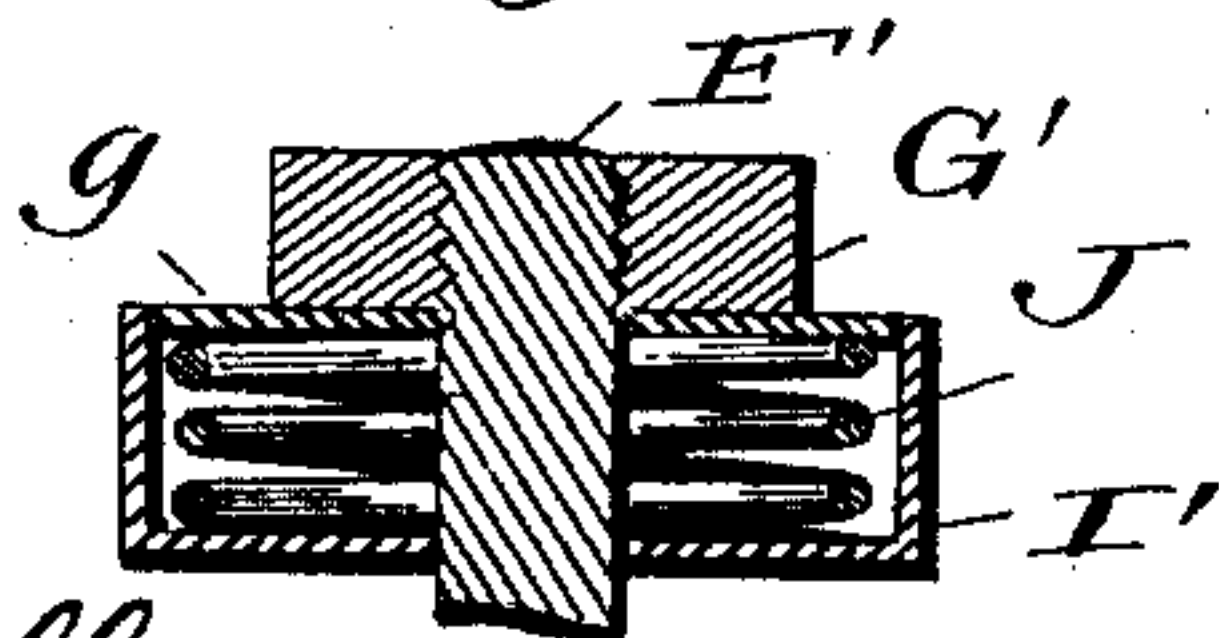


Fig. 5.



Witnesses

L. C. Hills,  
Alfred T. Arge.

Inventor,

John A. Steward,

By E. B. Stocking  
Attorney



# UNITED STATES PATENT OFFICE.

JOHN A. STEWARD, OF CLARENDON, VERMONT.

## SEAMING SHEET-METAL VESSELS.

SPECIFICATION forming part of Letters Patent No. 635,608, dated October 24, 1899.

Application filed March 3, 1899. Serial No. 707,669. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN A. STEWARD, a citizen of the United States, residing at East Clarendon, in the county of Rutland, State of Vermont, have invented certain new and useful Improvements in Seaming Sheet-Metal Vessels, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to new and useful improvements in mechanism for seaming sheet-metal vessels, such as cans, and particularly to a novel manner of mounting a wedge-finger for acting upon a seaming roll or tool.

15 The invention has for its object to provide a slightly elastic mounting for the wedge-finger or other member which forces the seaming-dies, particularly the final die, into contact with the vessel for the purpose of preventing injury to the seam by the pressure of the die through any inequality in the thickness of the seam incident to a varying thickness of metal or the presence of solder.

25 Other objects and advantages of the invention will hereinafter appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

30 In the drawings, Figure 1 is a vertical section through the seaming mechanism. Fig. 2 is a plan view of the same. Fig. 3 is a detail perspective of a wedge-finger. Fig. 4 is a similar view of a seaming die-roll and its carriage, and Fig. 5 is a vertical section of a modified form of the invention.

35 Like letters of reference indicate like parts throughout the several figures of the drawings.

40 Referring now to the details of the drawings by letter, A designates the seaming-disk, which is non-revoluble, as is also the seaming-annulus A' thereon, the said disk being carried by and in this instance shown as detachably mounted upon the stationary shaft A<sup>2</sup> within the hollow revoluble shaft A<sup>3</sup>, which carries the seaming-head B and its accessories, hereinafter described. The means for giving motion to the various parts is not  
45 herein illustrated, as it may be of any approved form—such, for instance, as is illustrated in my Patent No. 519,594, it being

deemed necessary simply to state in this connection that the necessary vertical reciprocatory movement is given to the head A<sup>x</sup> and its wedge-fingers, hereinafter described, through the medium of the fork A<sup>4</sup>, working in an annular groove A<sup>5</sup> of said head, as seen in Fig. 1.

The seaming-tools are carried by the head B, which is fixedly secured to the lower end of the hollow revoluble shaft A<sup>3</sup>, preferably by means of a screw-thread, as seen in Fig. 1, so as to permit of its ready removal when necessary by removal of the disk A, as will be readily understood by reference to said Fig. 1. This head is provided with three  
60 equally-spaced radial slots B', one of which is seen in Fig. 1 arranged upon the under side of the head, and also provided with suitable guides or ways b for suitable guides or means upon the movable carriages C, which are adapted to be moved in and out toward and from the center of the head by reciprocatory means to be described. Each of these carriages supports and carries a seaming-tool D. These seaming-tools are mounted to revolve  
65 upon vertical spindles d, suitably supported in the carriages C. Each seaming-tool has its periphery of a different contour from the others and adapted to perform each its own step in the seaming of the can. The seaming-tools are mounted in the head B, which is properly timed in its revolutions so as to bring acting portions of said tools into operative position automatically and consecutively, the reciprocatory means being also timed and adjusted to perform its function in this connection.

As above described, the head A<sup>x</sup> is reciprocated by mechanism not herein shown, and this head carries the wedge-fingers F, each having upon its inner face a tapered incline f, (seen in Figs. 1 and 3,) the said wedge-fingers having an upwardly-extending shank F', which is screw-threaded and passes through an opening in the head A<sup>x</sup> and through an opening g' in the plate G, mounted upon the upper face of said head A<sup>x</sup>, and the shank F' is provided with a nut G' and a washer g, all as clearly shown in Fig. 1. There are three of these wedge-fingers, one for each of the seaming-tools, and these wedge-fingers have their inclines so located as to operate at predetermined periods upon the roller and seam-



ing-tool. The roller H is mounted in lugs c on the carriages C, as shown best in Fig. 4, and a wedge-finger F bears against said roller to force the carriage C and seaming-roll D radially inward toward the disk A. The roller H prevents friction in its movement over the incline  $f$  and produces an easy and smooth operation of the several parts.

The wedge-fingers F have their shanks  $F'$  passed through the slot  $a^4$  of the head  $A^x$  and through slots  $g'$  in the plate G, which is, as above stated, mounted upon the upper face of the head  $A^x$  and sleeved about the hub thereof, as shown best in Fig. 1. These slots are arranged tangentially, as seen in Fig. 2, and the adjustment of these wedge-fingers in or out for different-sized cans is accomplished by the loosening of the nuts  $G'$  on the shanks of said wedge-fingers and then giving the said plate or disk G a rotary movement in the one direction or the other, according to whether it is desired to bring the wedge-fingers in or out, the movement of the said disk G determining the adjustment of the wedge-fingers, the shanks  $F'$  of which move in the radial slots  $a^4$  of the head  $A^x$ , and when in their adjusted positions they are there secured by the tightening of the nuts.

Fig. 2 represents a top plan of the head  $A^x$ , with the position of the slots  $g'$  in the plate G to indicate their positions relatively to the radial slots  $a^4$  of the head  $A^x$ , which are in dotted lines.

The construction hereinbefore described is substantially that disclosed in my Patent No. 570,147, in which structure it has been found that the final seaming roll or tool in finishing the seam is inclined to crowd the seam up over the top of the disk, so that the part of the roll that projects over the lower portion of the disk grinds off a portion of the seam, which in many cases causes leaks. This breaking or cutting of the seam is also caused by the final roll or tool when the same is held at a constant pressure and passes over an obstruction or extra thickness in the seam incident to the presence of solder at the joint or a varying thickness of the material. To prevent injury to the seam by the finishing roll or tool, I have found it necessary to introduce an elastic or yielding device for holding and supporting the finger or actuating member by which the roll is held in contact with the seam, so that said member can yield radially from the seam. One form of this elastic device is illustrated in Fig. 1, wherein an elastic or rubber block I is inclosed within a shell or case  $I'$ , and upon the upper surface of this rubber block the washer  $g$  beneath the nut  $G'$  bears. The nut is adjusted to place sufficient pressure upon the block I to firmly hold the wedge-finger F to the necessary extent to perform the seaming operation under the usual pressure; but when by reason of any increased pressure caused by an enlargement in the seam the die is forced from the disk, and by the compression of the block I

the finger F yields slightly in a radial direction to permit the roll to ride over the enlargement and exert thereon the proper pressure without injury to the seam. It will be observed that the normal or constant pressure upon the finger F may be regulated by adjusting the nut  $G'$ .

In Fig. 5 a slightly-modified form of the invention has been illustrated, in which a coil-spring J is substituted for the elastic block I within the case  $I'$ . The use of a rubber block or spring produces substantially equivalent action, so that the operation of the same is substantially identical in both constructions.

The operation of the several parts will be clearly understood from the foregoing description, and it may be stated that the provision of an elastic bearing for a wedge-finger prevents an overlapping of the seam through an excessive pressure thereon and the consequent grinding or cutting of the material at that point. It further permits the die roll or tool to ride over the lap-joint or any solder which may be present in the same to increase the thickness thereof, so that an even pressure upon the seam is maintained at all times, which is particularly desirable in a machine of this character. With this improvement introduced upon the class of machine described a can may be constructed with no packing in the seam and capable of withstanding a steam-pressure of ten pounds upon the contents thereof without leakage. Furthermore, in many cases the finishing-roll as now used will strike the seam and turn or rotate the cam, thus failing to properly perform its work, which is effectually accomplished by the introduction of the elastic bearing.

It is obvious that changes may be made in the details of construction and configuration without materially affecting the spirit of this invention as defined by the appended claims.

Having described my invention and set forth its merits, what I claim as new, and desire to secure by Letters Patent, is—

1. In a seaming-head, the combination of a seaming-tool movable to and from said head, a finger or arm for actuating said tool, a yielding bearing for said finger or arm, and means for actuating said finger or arm to feed said seaming-tool toward said head; substantially as specified.

2. The combination with a seaming-head, of a seaming-tool movable to and from the same, a finger or arm for actuating said tool, means for moving said finger or arm, a binding-nut for said finger, and an elastic bearing interposed between said nut and a support; substantially as specified.

3. The combination with a seaming-head, of a seaming-tool movable to and from the same, a finger or arm for actuating said tool, means for moving said finger or arm, a binding-nut for said finger, an elastic bearing interposed between said nut and a support, and a casing or cup within which said bearing is retained; substantially as specified.



4. The combination with a seaming-head, of a seaming-tool movable to and from the same, a finger or arm for actuating said tool, means for moving said finger or arm, a binding-nut for said finger, an elastic bearing interposed between said nut and a support, a casing or cup within which said bearing is retained, and a bearing-washer fed by said nut to compress the material of said elastic bearing; substantially as specified.

5. The combination with a seaming-head, of a movable head and a series of seaming-tools mounted in non-pivoted supports and provided with a part in the path of a reciprocatory device to be engaged thereby, whereby the tools may be reciprocated radially in fixed guides on said head, and an elastic bear-

ing to permit a yielding of said reciprocatory device; substantially as specified.

6. The combination with a head and radially-reciprocatory carriages, of rotary seaming-tools mounted in said carriages, reciprocatory wedge-fingers having inclined portions, a rotatable adjusting-disk for adjusting said fingers radially on said head, and an elastic or yielding bearing for said fingers; substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN A. STEWARD.

Witnesses:

S. HENRY ARCHIBALD,  
THOS. C. ROBBINS.