

(No Model.)

2 Sheets—Sheet 1.

C. T. SCHOEN.

DIE FOR MAKING CAR SPRING PLATES.

No. 368,428.

Patented Aug. 16, 1887.

FIG. 1

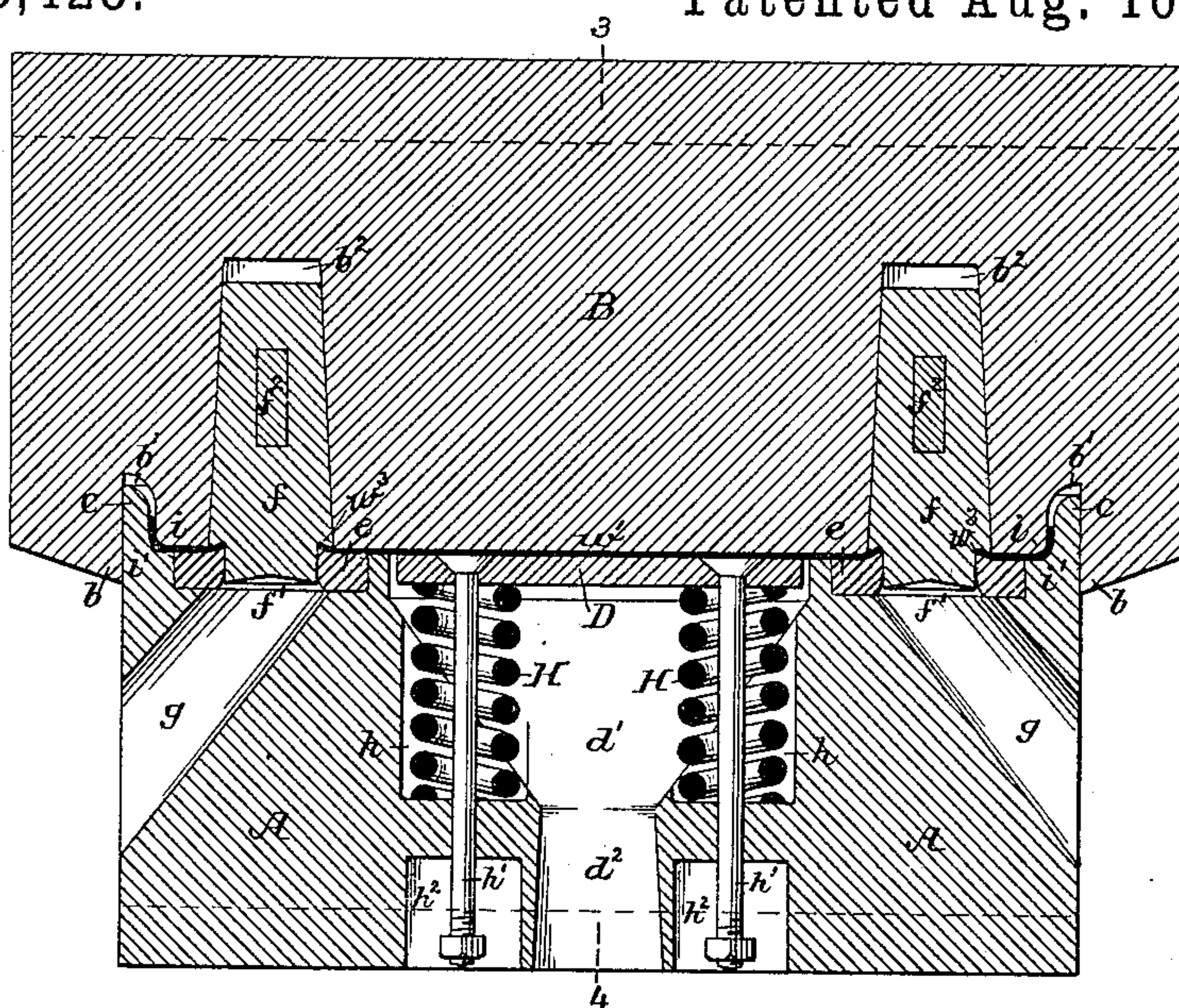


FIG. 2

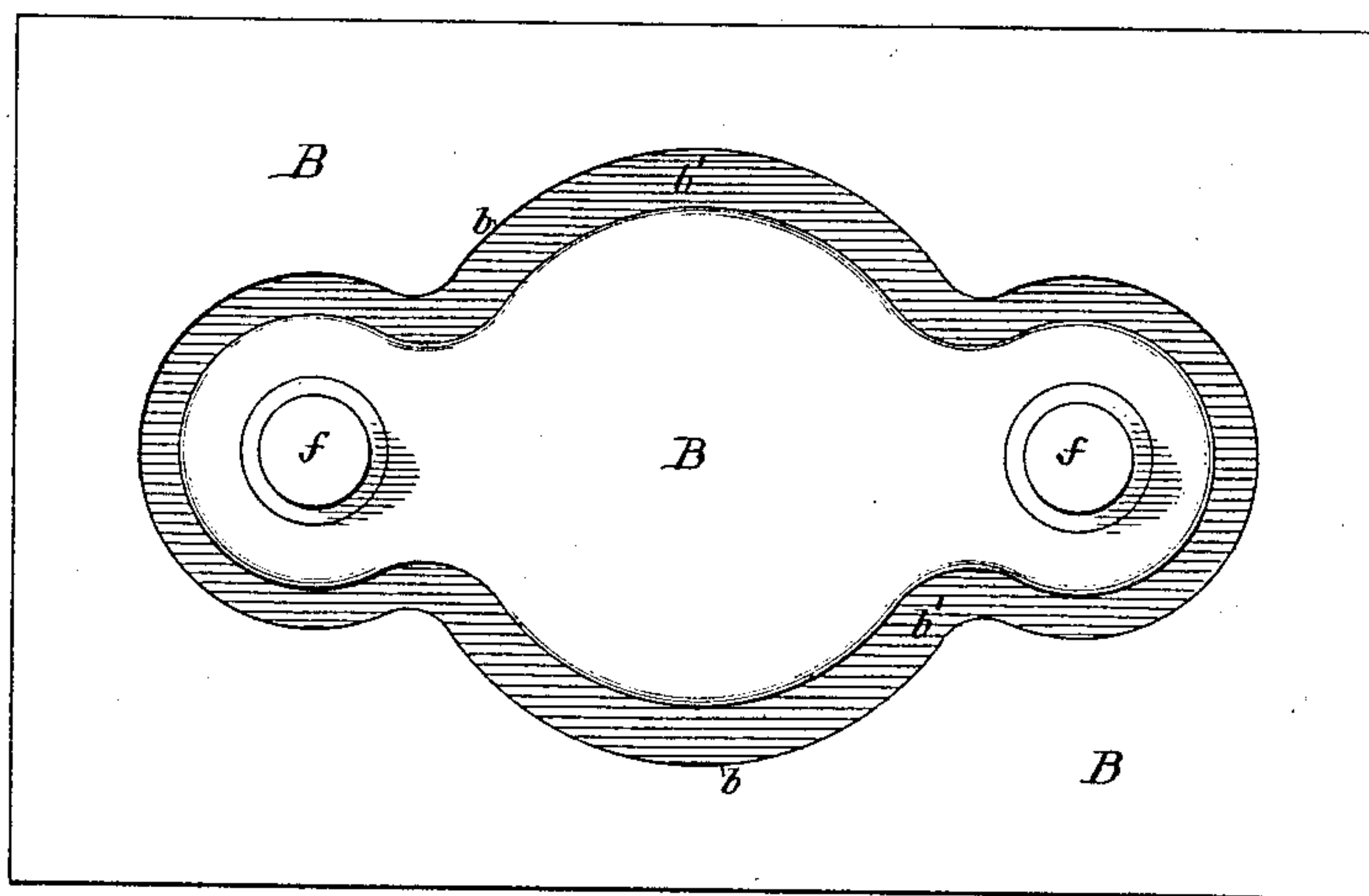
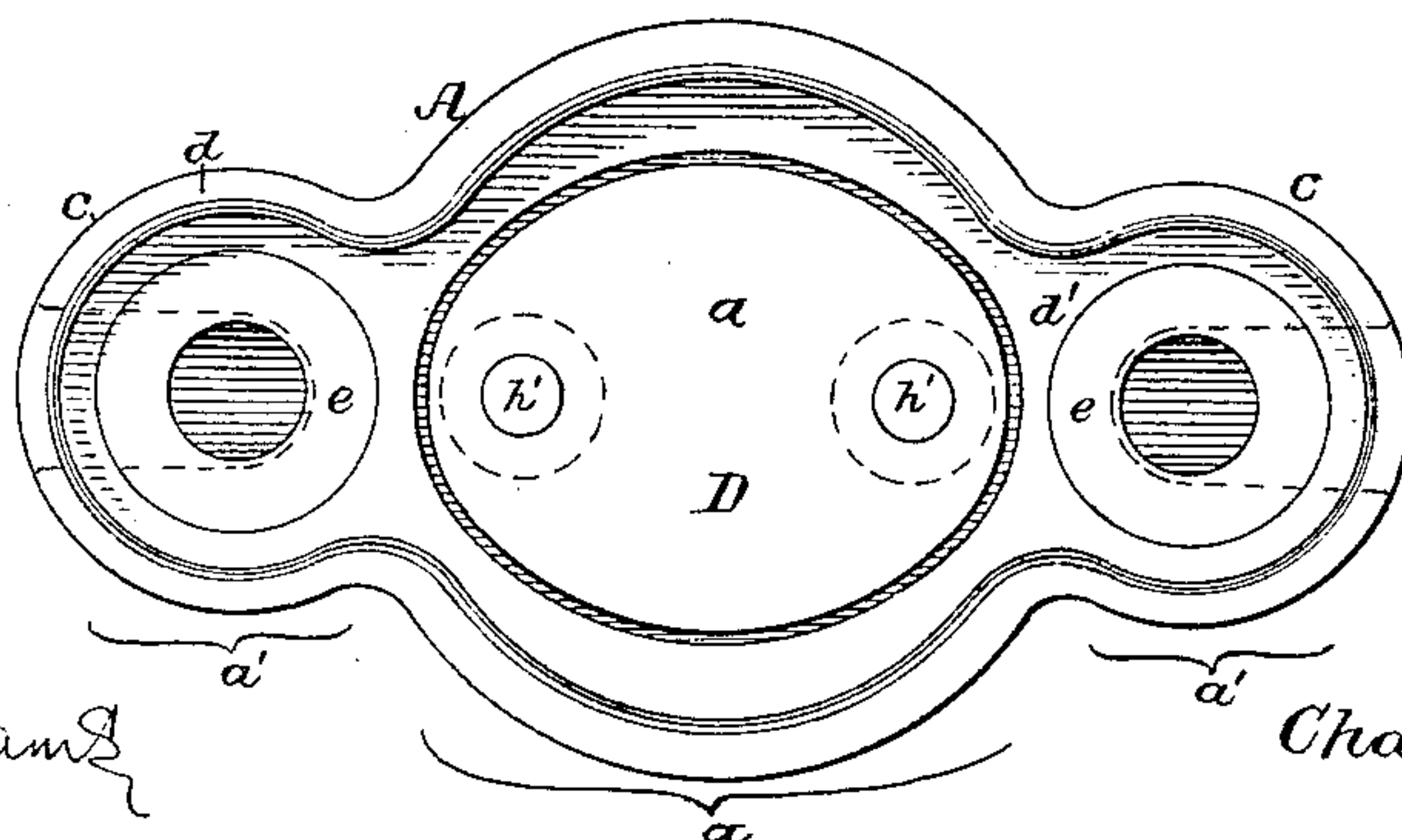


FIG. 3.



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William D. Bonner.

Inventor:  
Charles T. Schoen

By his Attorneys Houston & Long



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FIG. 4.

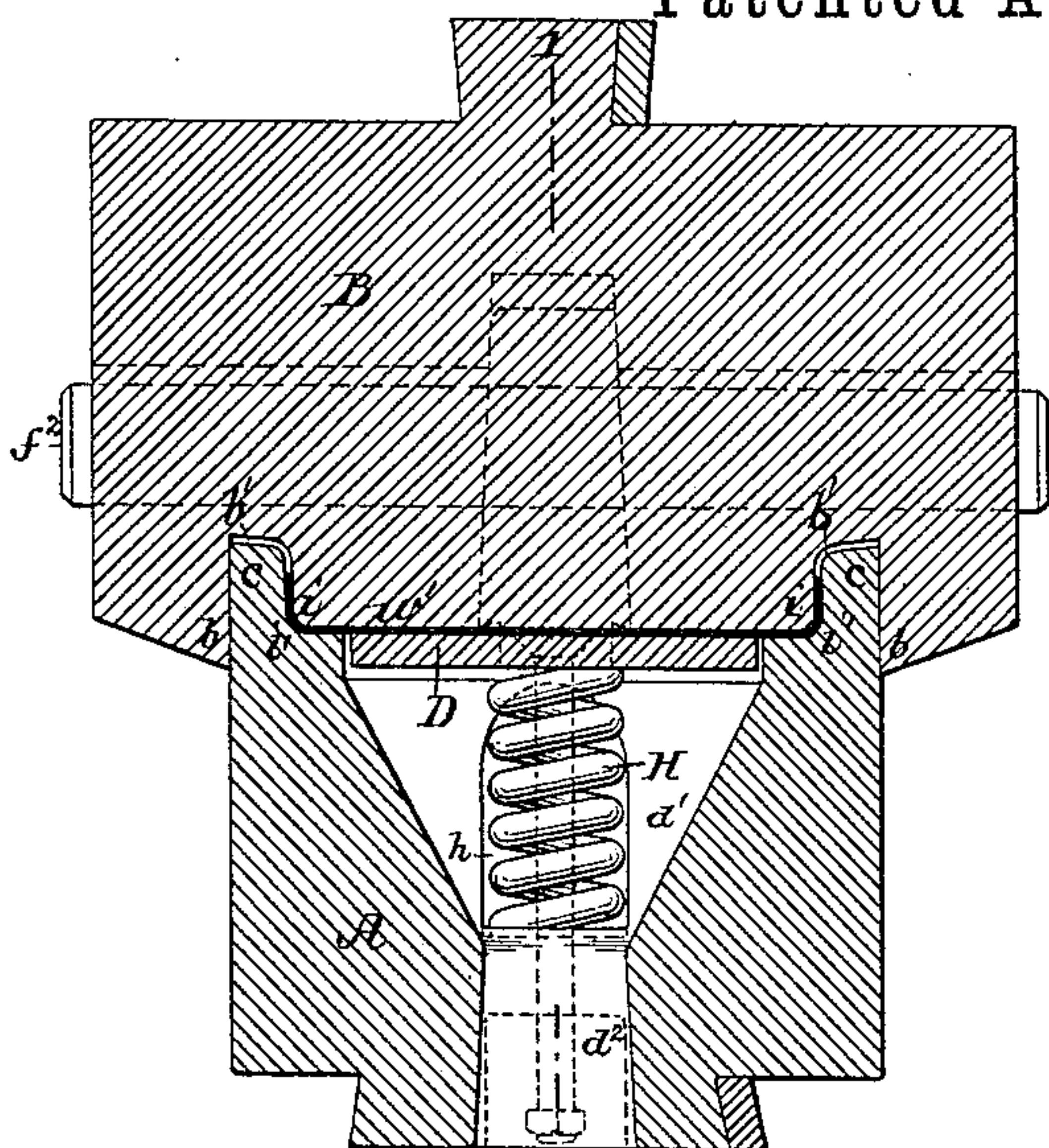


FIG. 5.

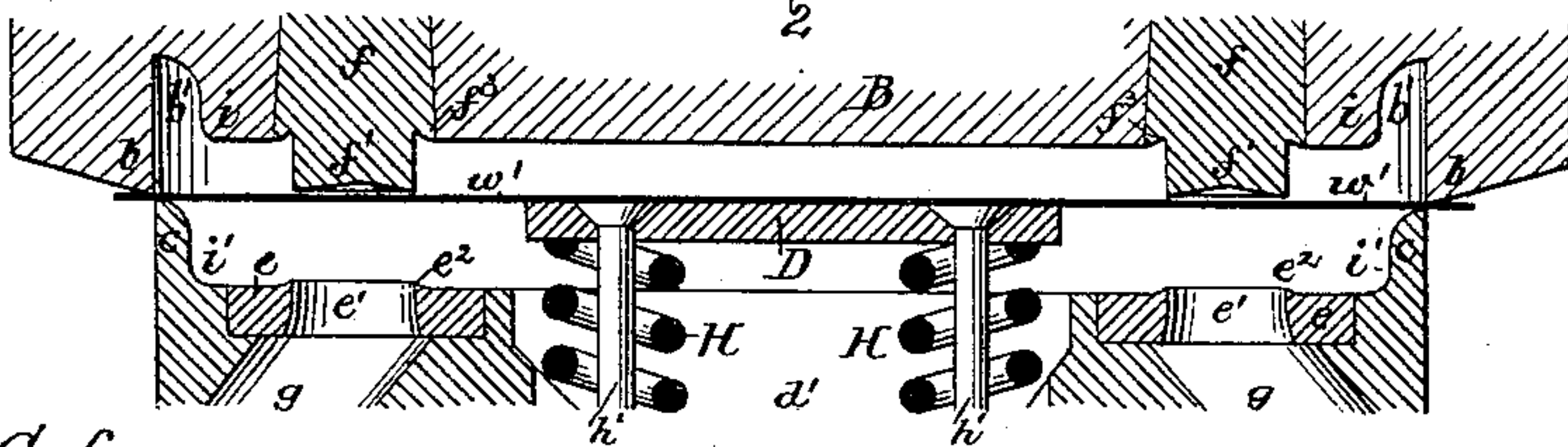


FIG. 6.

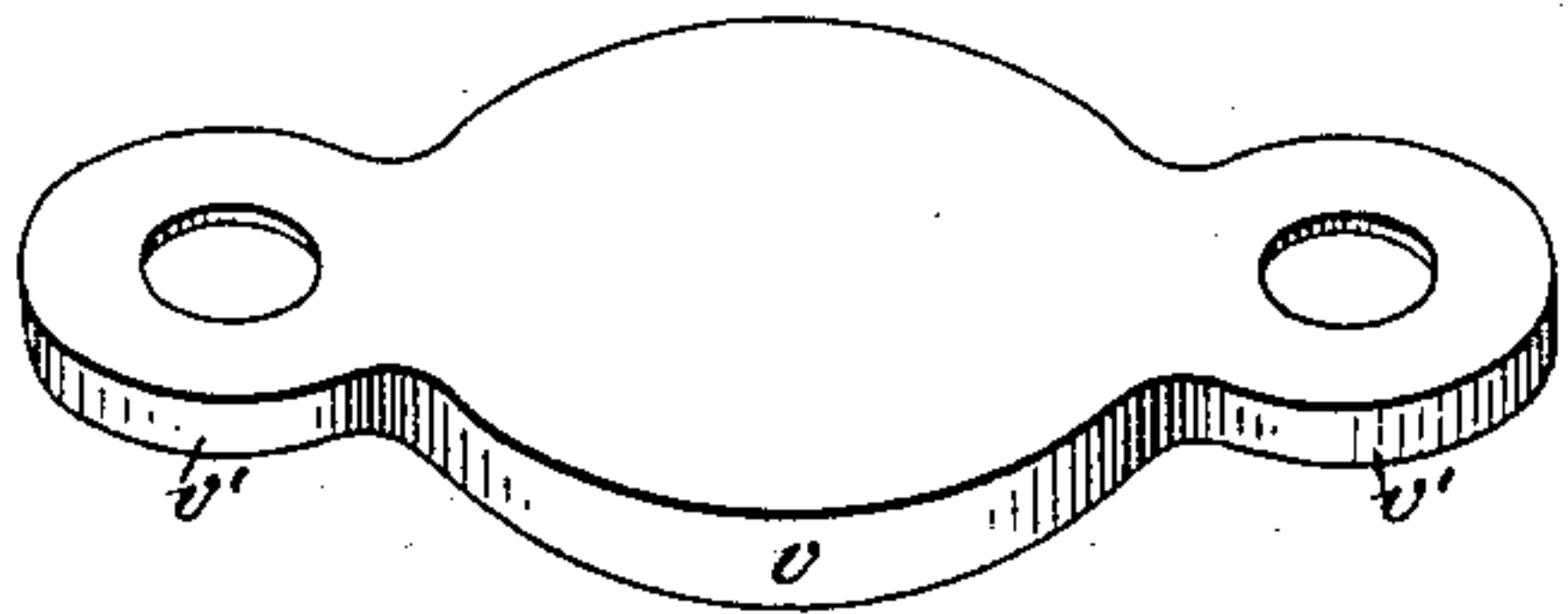


FIG. 7.

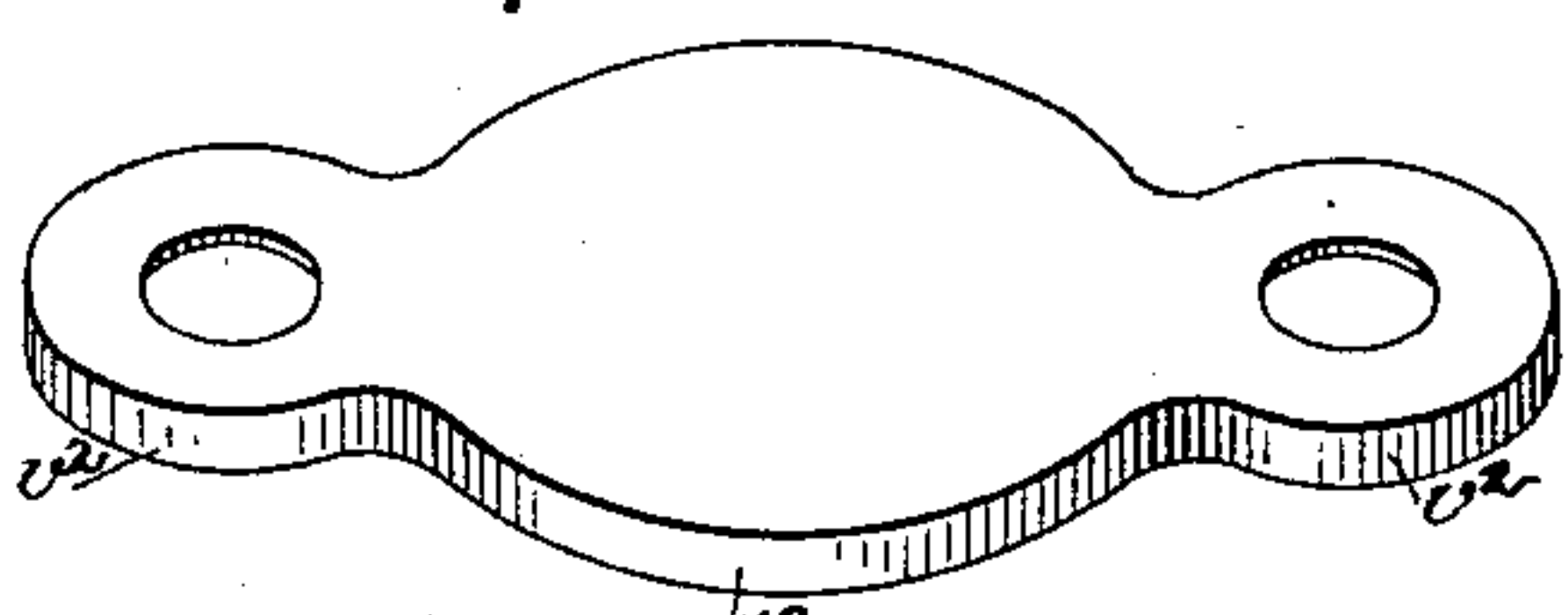


FIG. 8.

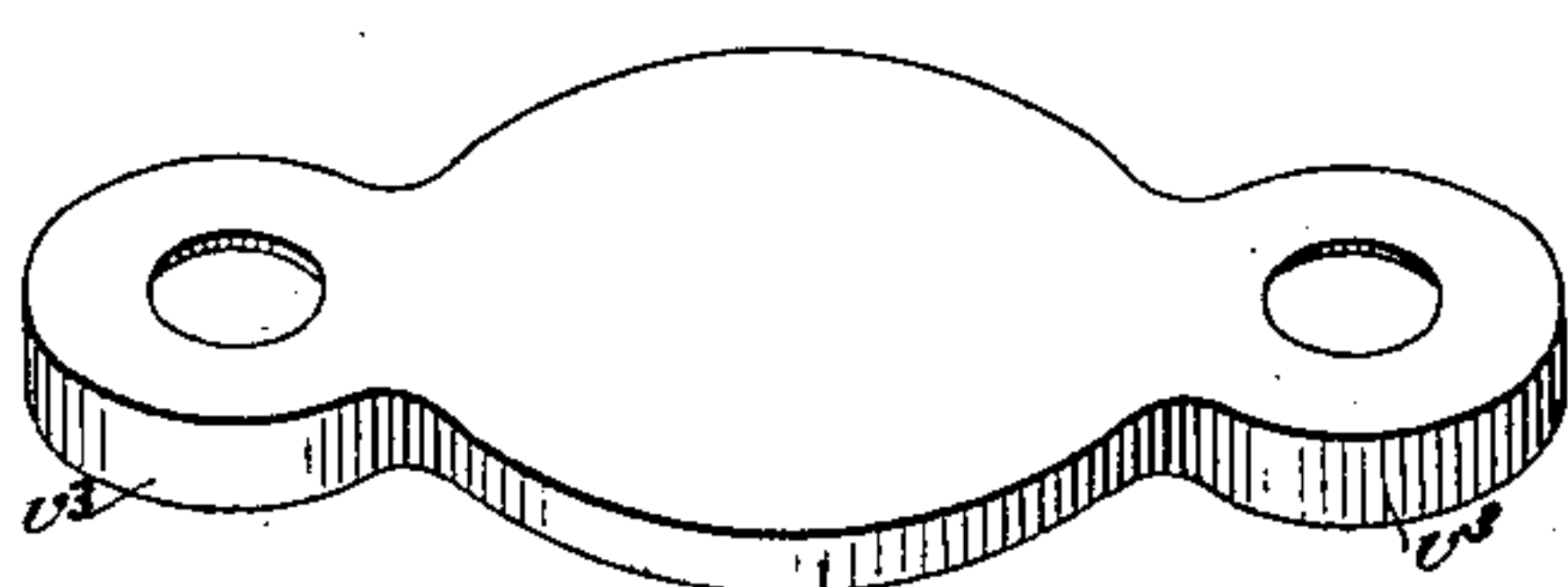


FIG. 9.

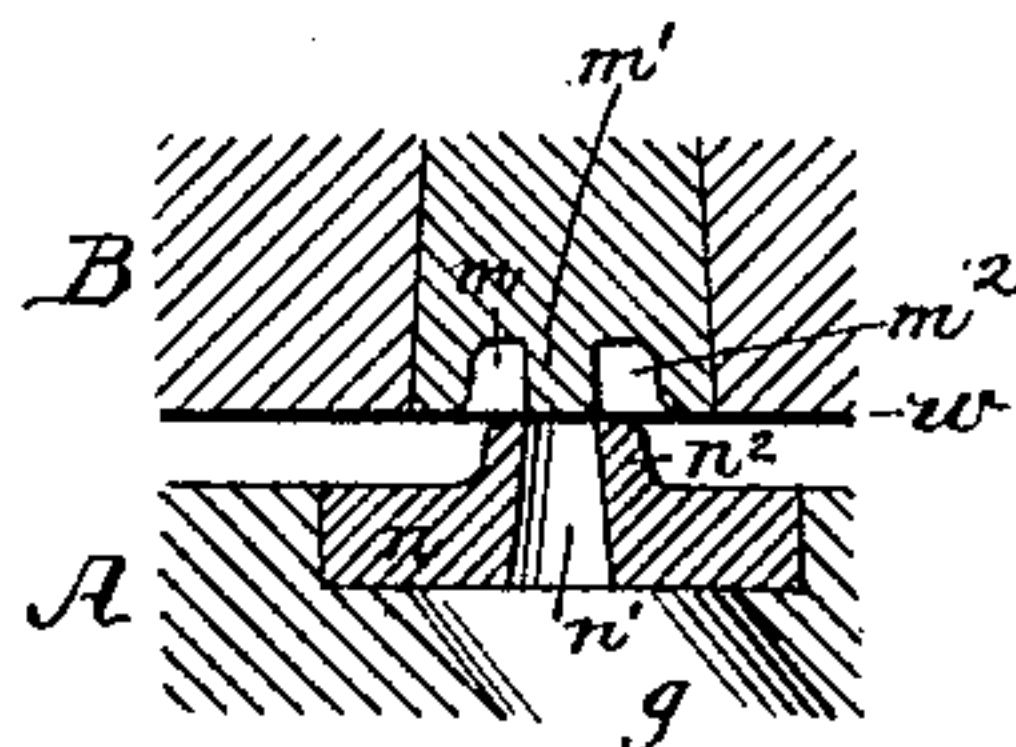
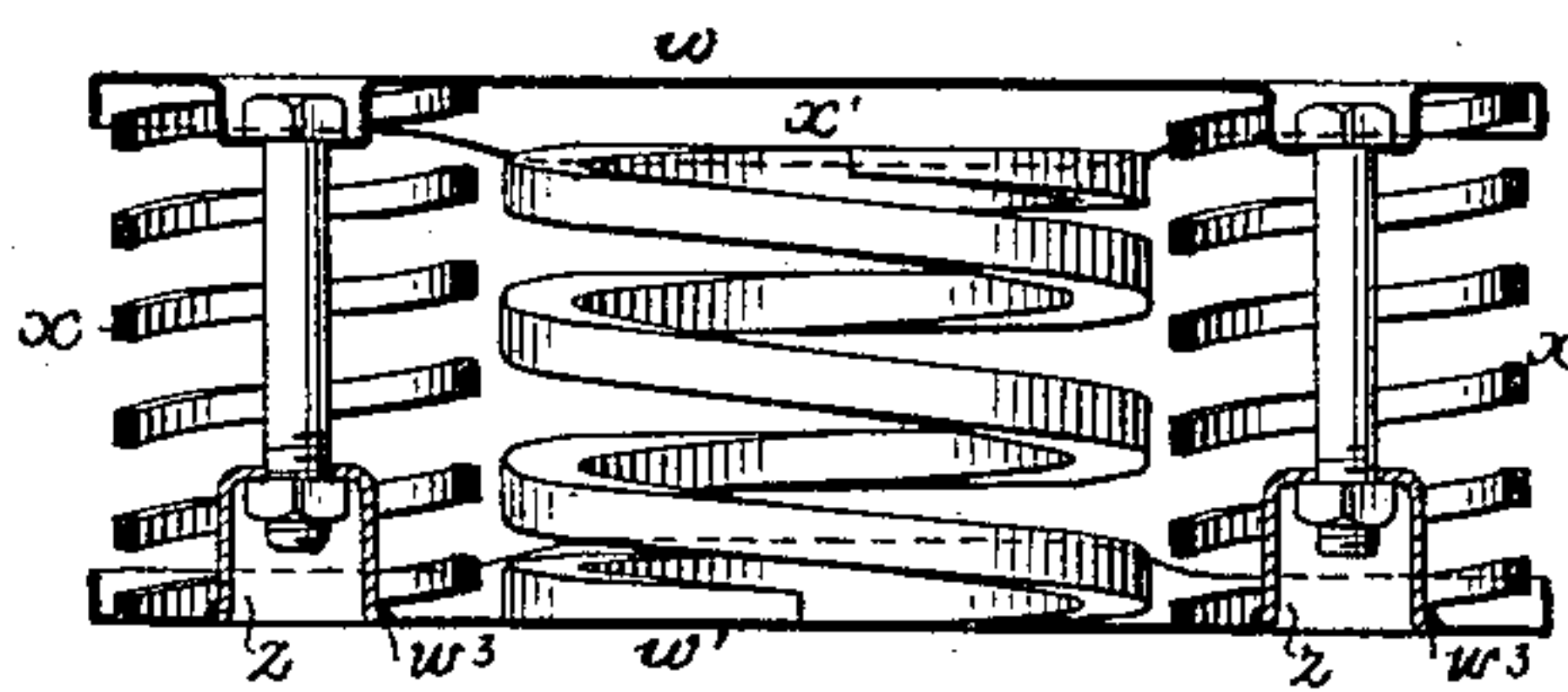


FIG. 10.



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By his Attorney Howson & Sons



# UNITED STATES PATENT OFFICE.

CHARLES T. SCHOEN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO  
THE CHARLES SCOTT SPRING COMPANY, OF SAME PLACE.

## DIE FOR MAKING CAR-SPRING PLATES.

SPECIFICATION forming part of Letters Patent No. 368,428, dated August 16, 1887.

Application filed April 15, 1887. Serial No. 234,882. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES T. SCHOEN, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in the Manufacture of Car-Spring Plates, of which the following is a specification.

The object of my invention is to cut and strike up at one operation sheet-metal plates of irregular shape for use as the top and bottom plates of car-spring boxes. One great advantage of these wrought-metal plates is in their durability over the cast-iron plates and in the reduction of the thickness of the metal, which allows a greater length of spring in the box, so that an easier motion is allowed to the car.

In the accompanying drawings, Figure 1 is a longitudinal section on the line 1 2, Fig. 4, of the upper and lower dies, with a plate cut and stamped into form. Fig. 2 is an inverted plan view of the upper die. Fig. 3 is a plan view of the lower die. Fig. 4 is a transverse section on the line 3 4, Fig. 1. Fig. 5 is a diagram illustrating the upper die raised and with the plate inserted between the dies ready to be cut and bent. Figs. 6, 7, and 8 are views showing different forms of plates after being stamped up. Fig. 9 is a detached view of dies used in striking up and punching the upper spring-plate, and Fig. 10 is a longitudinal sectional view of a car-spring box complete with my improved top and bottom plates.

Referring to Figs. 1, 4, and 5, A is the lower die, and B the upper die. The lower die, A, is of the peculiar form shown in Fig. 3, having a circular central portion, *a*, with circular side extensions, *a' a'*. This die has an annular projection, *d*, and a cutting-edge, *c*, around its periphery, and is depressed in the center, as shown in Figs. 1, 3, and 5. The upper die is of the form shown in Fig. 2, and has a cutting-edge, *b*, to correspond with the cutting-edge *c* of the lower die, and it has also an annular recess, *d'*, into which the annular projection *d* of the lower die extends when the dies come together. These dies cut and form either the top plate, *w*, or bottom plate, *w'*, of the car-spring box, as shown in Fig. 10. This box contains three springs, *x x'*, the two outer springs,

*x*, being longer than the central spring, *x'*. Consequently the die is so constructed that a flange, *v*, deeper in the center than at the ends, is formed on the plate to retain the short spring *x'* in place.

Inserted in the lower die, A, are circular cutting-dies *e e*, having circular openings *e'*. In the upper die, B, are cutting-dies *f f*, having circular projections *f'*, which are adapted to pass through the openings in the lower cutting-dies. The cutting-edges *f'* of the upper dies are in the same longitudinal plane as the cutting-edges *b*, as shown in Fig. 5. Extending, preferably at an angle, from the lower dies are channels *g g*, through which the cuttings are allowed to escape.

In the center of the die A is a plate, D, which can occupy a recess, *d'*, in the die. This opening *d'* is tapering in form, as shown in Figs. 1 and 4, and connects with a passage, *d''*. The opening *d'* and passage *d''* allow of the removal of any scaling or foreign matter that may be on the die.

The plate D is supported by springs H H, resting in pockets *h*, as shown in Fig. 1, and rods *h'* extend from the plate D through the springs H and a portion of the lower die, A, and are provided with suitable nuts, in order to adjust the plate to any position required. This plate D and its openings serve to eject the sheet-metal plate out of the die after it has been punched and formed, and also to support the central portion of the blank before it is cut. The nuts on the rod *h'* play in suitable pockets, *h''*, on the under side of the die, as shown in Fig. 1. The upper dies, *f*, have tapered shanks which fit into tapered cavities *b''* in the upper die, B, and are held in place by suitable wedges, *f''*, so that they can be readily removed and replaced when required. The lower dies, *e*, are also removable for repairs and for inserting dies of different character. The annular recess *b'*, formed in the upper die, leaves the central portion of the die in the shape of a former having rounded corners *i i*, corresponding with rounded corners *i'* on the lower die.

Referring to Fig. 5, which illustrates the upper die raised, a plate, *w'*, for the lower plate of the spring-box is shown in place,



ready to be punched and pressed in shape. On the downward movement of the die B the irregular edges are first cut by the cutting-edges  $b\ c$ , the plate being hot. The points  $f'$  of the upper cutting-die,  $f$ , will then press the plate down until it comes in contact with the lower dies,  $e$ , and the upper dies will pass through the plate, forming orifices  $w^2$ , Fig. 10. Then the central former of the upper die will press the plate into shape and produce the annular flange around the plate, as shown in Fig. 6, the flange being deeper at the middle portion,  $v$ , than on the two outer circular portions,  $v'$ , owing to the recess  $b'$  being wider on each middle portion than on the ends, as shown in Figs. 2 and 3.

I have shown in Figs. 1, 4, and 5 the dies  $e$  and  $f$  for punching the holes  $w^2$  in the lower plate,  $w'$ , of the spring-box. The upper dies,  $f$ , have annular recesses  $f^3$ , Fig. 5, and the die  $e$  has an annular rib,  $e^2$ , adapted to fit into the recess, so that when the plate is punched a small depression,  $w^3$ , will be formed around the opening  $w^2$ . In this opening is inserted a cup,  $z$ , preferably of malleable iron, into which the head of the bolt is inserted and allowed free play, as in ordinary car-springs of this class.

When the upper plate,  $w$ , is to be punched, I use the top and bottom dies,  $m$  and  $n$ . (Shown in Fig. 9.) The upper die,  $m$ , has a punch,  $m'$ , and an annular recess,  $m^2$ , around this punch. The lower die has an orifice,  $n'$ , through which the punch  $m'$  passes on its downward movement, and is provided with a former,  $n^2$ , adapted to force the metal of the plate  $w$  into the annular cavity  $m^2$  of the upper die, forming the plate  $w$ , as shown in Fig. 10.

The plates may be formed with flanges  $v^2$  of the same depth around the circumference, as shown in Fig. 7; or the flange may be deeper at the outer ends,  $v^3\ v^3$ , as shown in Fig. 8, depending altogether upon the set of springs in the box.

I do not claim forming car-spring plates of sheet-iron or steel, plates of this kind having been made circular and of other forms, but without flanges; nor do I claim the cup  $z$ .

I claim as my invention—

1. The combination of the lower die, A, having an annular flange provided with a cutting-edge, with the upper die, B, having an annular cutting-edge, and a central former adapted to force the cut plate into shape, substantially as described.

2. The combination of the lower die, A, having an annular cutting-edge, and dies  $e$ , with an upper die, B, having cutting-edges, and dies  $f$ , substantially as described.

3. The combination of the lower die, A, having an annular cutting-flange,  $d$ , irregular in width, with a die, B, having a corresponding recess,  $b'$ , as and for the purpose set forth.

4. The combination of the lower die and its cutting-edges and the upper die, B, and its cutting-edges with a spring-plate, D, resting in an opening,  $d'$ , in the center of the lower die, and adapted to force the plate out of the die after being cut and punched into shape, substantially as described.

5. The combination of the upper die, B, and lower die, A, with upper and lower cutting-dies,  $f$  and  $e$ , the die  $f$  having an annular recess,  $f^3$ , and the die  $e$  having an annular rib,  $e^2$ , as and for the purpose set forth.

6. The combination of the upper die, B, and the lower die, A, with dies  $m$  and  $n$ , the die  $m$  having a central punch,  $m'$ , and an annular recess,  $m^2$ , around the punch, and the lower die having an opening,  $n'$ , and an annular projection,  $n^2$ , substantially as and for the purpose described.

7. A plate for car-springs formed of wrought metal having a flange around the periphery adapted to hold the spring or springs in position, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHAS. T. SCHOEN.

Witnesses:

JOHN E. PARKER,  
W. J. SMYTH.