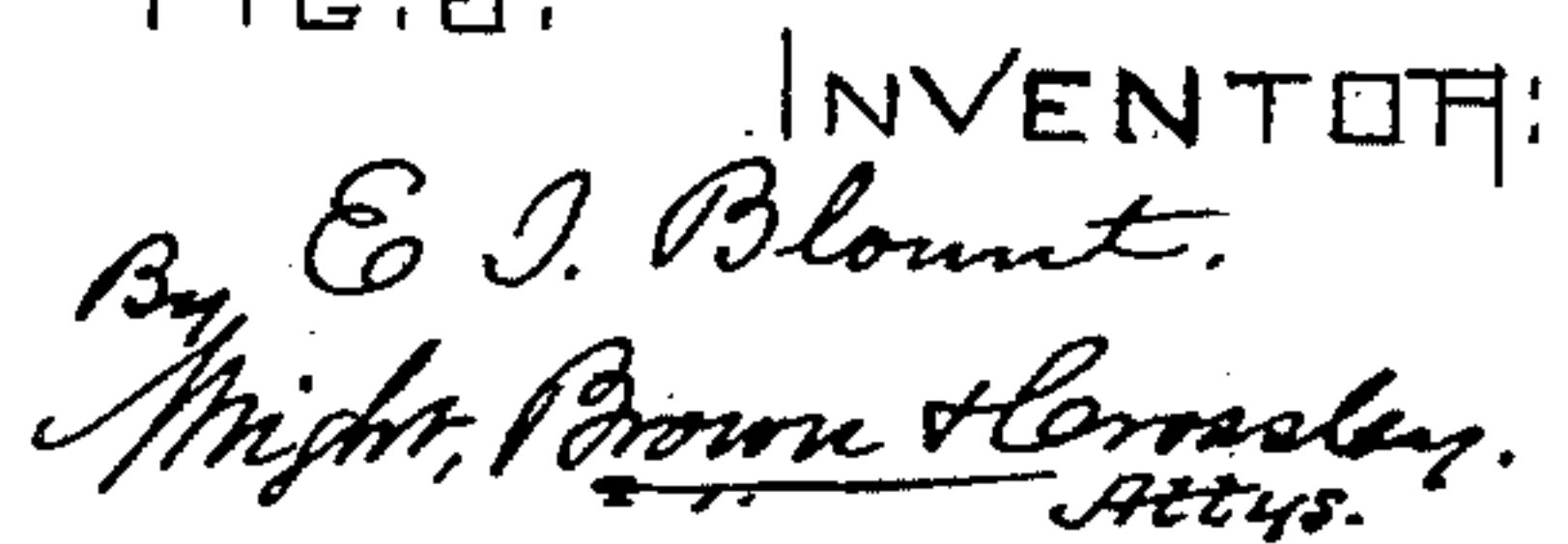


2 Sheets—Sheet 1.

Patented Sept. 2, 1890.



(No Model.)

2 Sheets—Sheet 2.

E. I. BLOUNT.
DOOR CHECK.

No. 435,677.

Patented Sept. 2, 1890.

FIG. 6.

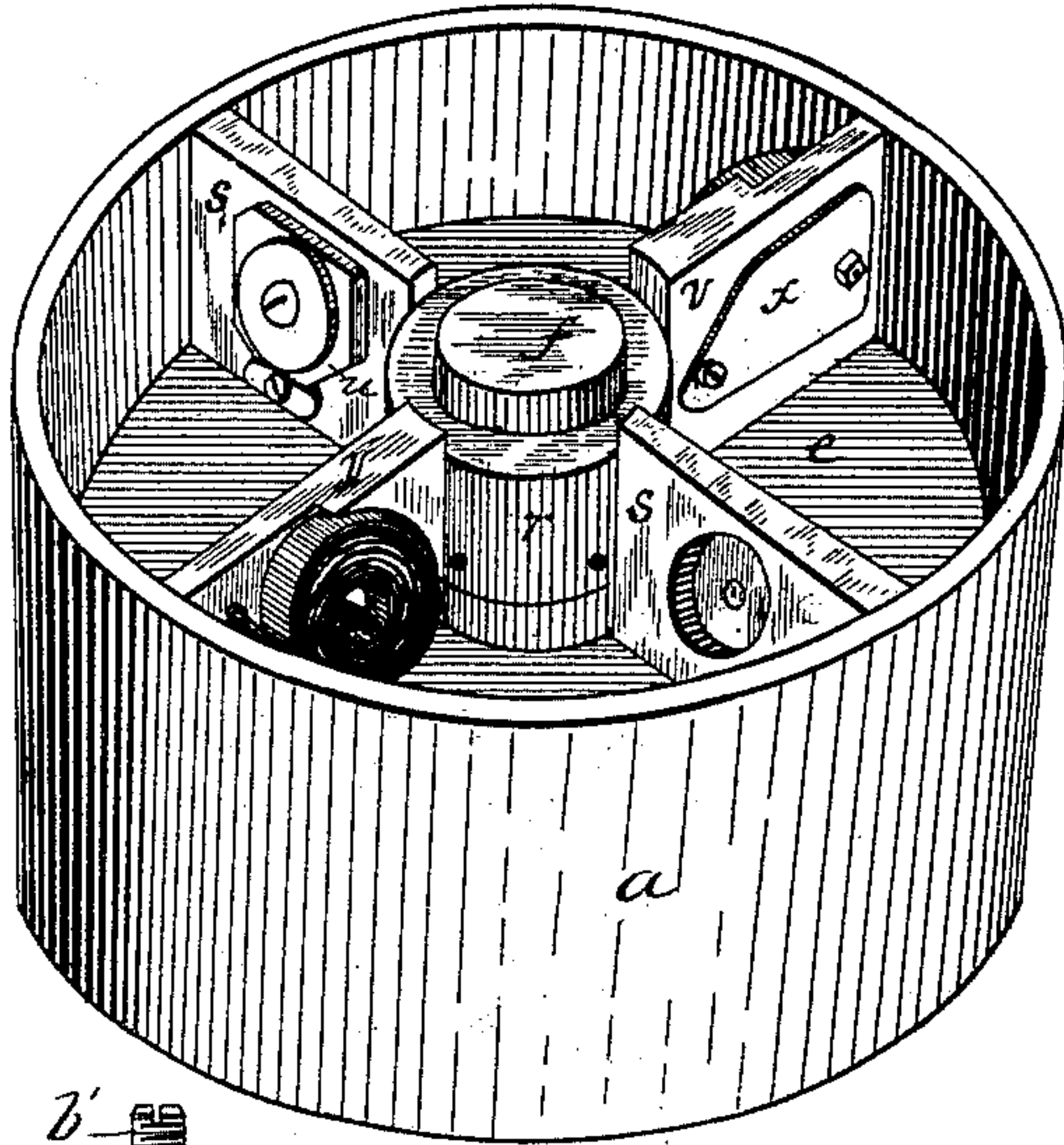


FIG. 7.

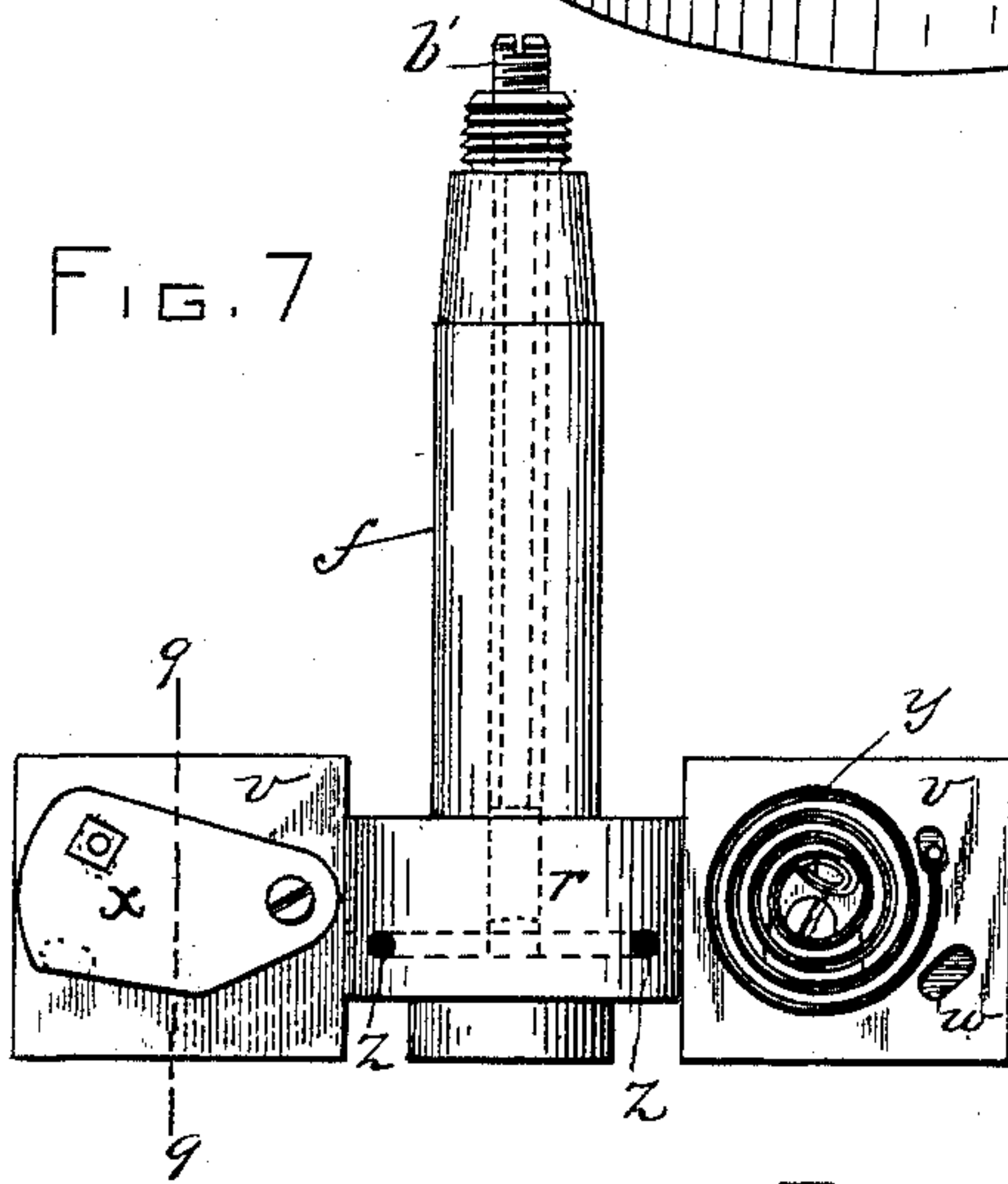


FIG. 8.

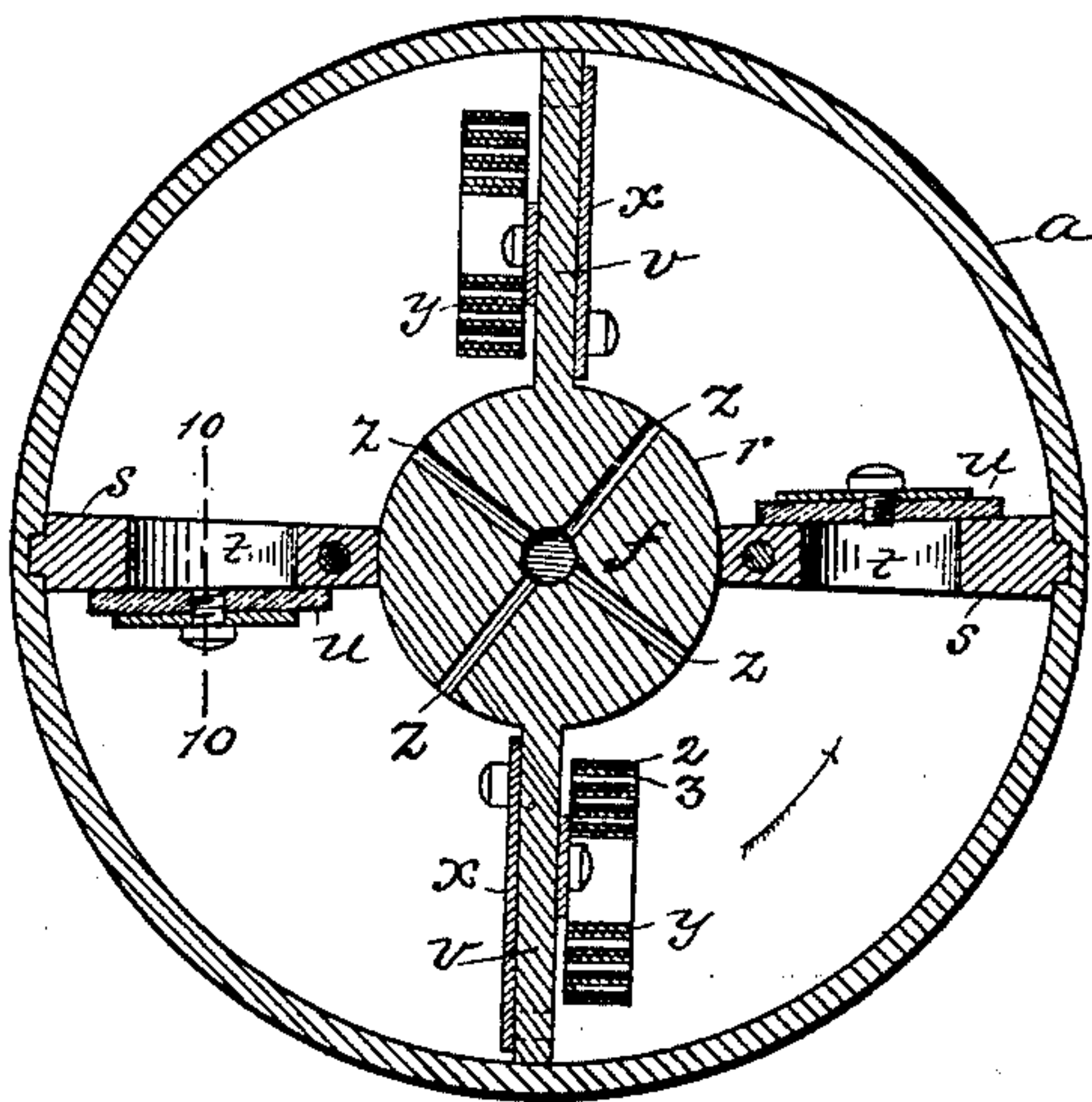


FIG. 10.

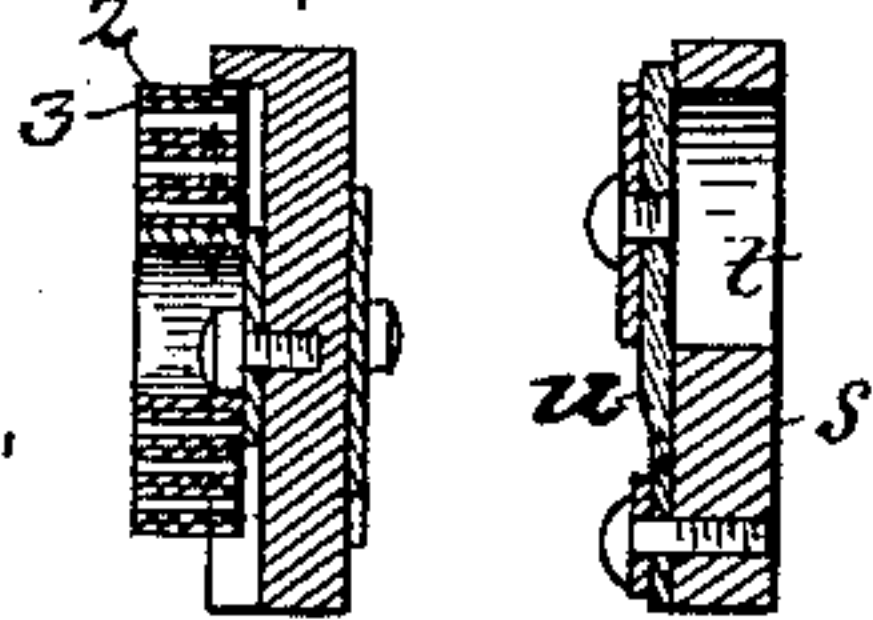


FIG. 9.

WITNESSES.

A. J. Harrison
W. B. Ramsay

INVENTOR:

E. I. Blount.

By *Wm. Brown & Crossley.*
Attys.

UNITED STATES PATENT OFFICE.

EUGENE I. BLOUNT, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE BLOUNT MANUFACTURING COMPANY, OF MAINE.

DOOR-CHECK.

SPECIFICATION forming part of Letters Patent No. 435,677, dated September 2, 1890.

Application filed April 2, 1889. Serial No. 305,674. (No model.)

To all whom it may concern:

Be it known that I, EUGENE I. BLOUNT, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Door-Checks, of which the following is a specification.

My invention, relating to door-checks generally, and particularly to door-checks in which oil, glycerine, or other suitable liquid is employed as a cushioning means, has for its object the provision of improvements which shall avoid leakage of the liquid from the device, automatically control or adjust the valves to accommodate the latter to the varying temperature and consequent variation in the stiffness of the liquid, and overcome other objections and afford new advantages, as is hereinafter more fully described, and subsequently pointed out in the claims.

In the drawings hereunto annexed and forming a part of this specification, Figure 1 is a perspective view of my improved door-check, the bracket for securing the actuating-arm to the door being turned upward. Fig. 2 is a plan view of my improved door-check, showing the manner of applying the same to the door and its casing. Fig. 3 is a vertical sectional view of the spring-casing and liquid-cup and associated parts, taken on line 3 3 of Fig. 2. Fig. 4 is a horizontal sectional view taken on the line 4 4 of Fig. 3. Fig. 5 is a horizontal sectional view taken on the line 5 5 of Fig. 3. Fig. 6 is a perspective view of the spring-casing and liquid-cup, showing the contrivances arranged and operating in the latter. Fig. 7 is a side view, inverted, of the devices for operating upon the liquid in the liquid-cup. Fig. 8 is a horizontal sectional view taken on the line 8 8 of Fig. 3. Fig. 9 is a sectional detail taken on the line 9 9 of Fig. 7. Fig. 10 is a sectional detail taken on the line 10 10 of Fig. 8. Figs. 6 to 10, inclusive, are drawn to an enlarged scale. Fig. 11 is a detail showing the end of the arm projecting from the bracket secured to the door. Fig. 12 is a sectional detail taken on the line 12 12 of Fig. 2. Fig. 13 is a sectional detail taken on the line 13 13 of Fig. 1.

The same letters and figures of reference indicate the same parts in all the figures.

Referring to the drawings, D designates a door, and C the door-casing.

a designates a short cylinder divided horizontally by the partition *a'* into two compartments *b c*, the former constituting a spring-casing and the latter a liquid-cup.

Caps *d* and *e* are suitably secured upon the ends of the cylinder, and a hole is formed in the cap to the spring-casing and in the partition *a'* for the reception of the axle or spindle *f*, which is suitably stepped or has a bearing for its inner end formed upon the inner surface of the cap *e* of the liquid-cup.

g designates a coiled spring arranged in the spring-casing *b* and having its outer end secured to said casing and its inner end engaged with a sleeve *h*, which extends through a hole in the cap *d*, and through which sleeve the axle *f* is passed, as clearly shown in Figs. 3 and 4. Said sleeve *h* is provided on its outer end with a laterally-extending segment or arm *i*, having ratchet-teeth *j* on its periphery, which ratchet-teeth are engaged by a pawl *k*, pivoted on the outer end of an arm *l*, keyed or otherwise secured at its inner end to shaft *f*. Said arm *l* is also secured to or may be made as an integral part of a lever *m*.

The cylinder *a* is provided with a bracket or base *n*, whereby it may be secured to a door-casing C.

o designates a bracket adapted to be secured to a door and provided with an arm *p*, having a ball-and-socket-joint connection with one end of a link-rod *q*, the opposite end of which has a ball-and-socket-joint-connection with the free end of arm *m*, as shown.

With the construction and arrangement of parts thus far described it will be understood that upon opening the door D the arm *m* will be moved through the medium of link-rod *q* so as to turn axle *f* and sleeve *h*, the latter operating to "wind up" spring *g*, increasing the tension on the latter, which will tend to move the arm back to its normal position and close the door with considerable force, such force being rendered greater or less in accordance with the adjustment of the pawl *k* with the ratchet-teeth *j*, as will be readily understood from an inspection of the drawings.

In order to "cushion" the force of the spring and cause the door to move from an open toward a closed position comparatively quickly and then be fully closed with a comparatively slow movement, I provide devices which operate in the liquid-cup, which devices will be next described.

Shaft *f* is provided near its inner end with an enlarged hub *r*, which is loosely though closely fitted between the inner ends of vertical partitions *s*, extending from the sides of the liquid-cup and between the partition *a'* and cap *e*. Said partitions *s* are provided with apertures *t*, the latter being covered on one side of the partition *s* by a clapper-valve *u*, as is most clearly shown in Figs. 6 and 10.

Hub *r* is provided with wings or arms *v*, which extend to the sides of the cup *c* and between the partitions *a'* and cap *e*, which wings are provided with small apertures *w*, adapted to be opened and closed by a pivoted valve *x*, the free end of which is connected to the free end of a coiled spring *y*, the other end of said spring being connected to the wing *v*. The spring *y* is composed of two strips of metal 2 3, (see Figs. 8 and 9,) possessing expansive and contractive properties in different degree under the same temperature, so that as the liquid which may be used in the cup *c* becomes warmed or is chilled in accordance with the condition as to temperature of the atmosphere the spring will have a tendency to coil more closely or to uncoil, as the case may be, and so partially or wholly close the aperture *w* or open the same.

z z designate apertures formed in the hub *r* and extending transversely from its periphery to a central point, where they communicate with a bore or hole extending longitudinally in the axle *f* from the top of the same into the hub *r*.

b' designates a plunger or stopple rod arranged in the hole in axle *f*, (see dotted lines in Fig. 7,) said plunger *b'* being so constructed and arranged that it may be made to partially or wholly close the lower end of the hole formed in axle *f*, and thus partially or wholly cut off communication of the apertures *z z* with each other, this result being accomplished by raising or lowering the rod *b'* in the hole in axle *f*, and this may be done by giving plunger-rod *b'* a screw-threaded connection with the upper end of said axle or in any other suitable way.

The operation of my complete device may be described as follows: The several parts being arranged as shown in Figs. 1, 2, and 3, and the cup *c* being filled with a suitable liquid—say glycerine or oil—and the pawl *k* being adjusted with such tooth of the ratchet-segment *j* as will give the required tension or force to the spring *g*, upon opening the door the wings *v* will be moved in the cup *c* in the direction of the arrow, Fig. 8, forcing the liquid in said cup through the aperture *t* in the partitions *s*, the clapper-valves *u* yielding to allow of this, and at the same time wind-

ing up the spring *g* and increasing the tension or force of the same. When the door is released, the spring *g* will operate to return the parts to their normal position and consequently close the door; but as the apertures *t* will be closed by the clapper-valves *u*, and the liquid in the cup *c* will be allowed to escape from in front of the wings *v* (considered with respect to the direction of their movement) to place behind the same only through the apertures *w* and *z*, and this necessarily with comparative slowness, the force of the spring will be cushioned, and by reason of the change in the leverage on arm *m*, consequent on the eccentricity of its fulcrum on axle *f* with respect to the pintle of the hinge or axis of movement *c'* of the door and the variation of the spring *g*, the door will move toward a closed position, first with a comparatively quick motion and then to a fully closed position with a comparatively slow motion. By varying the extent of the apertures *z*, which may be accomplished by the plunger-rod *b'*, as described, the quickness or slowness with which the door may be closed can be regulated, the operation of the springs *y*, due to the temperature of the liquid in the cup, automatically moving valves *x* to open or close the apertures *w*, so as to accommodate the contrivance to the thickness or thinness of the liquid in the cup, as the same may be varied by the atmospheric temperature. The ball-joint connection of the link *q* with the lever or arm *m* and the arm *p* of bracket *b* operates to prevent binding of the parts as the door is opened or closed, and the fulcrum of lever *m* on axle *f* changes with respect to the axis of movement *c'* of the door.

It is obvious that changes may be made in the form and arrangement of parts constituting my improvements without departing from the nature or spirit of the invention.

Having thus described my invention, I declare that what I claim is—

1. In a door-check, an arm *m* and its connections with a door, a cylinder comprising a combined spring-casing and liquid-cup, the latter being provided with partitions and ports for the flow of liquid from one side of the partitions to the other, an axle extending through said casing and into said cup and connected with said arm, a spring in said casing connected with said axle, and wings, also connected with said axle and arranged to operate on opposite sides of the partitions in said liquid-cup, combined and operating substantially as hereinbefore set forth.

2. In a door-check, a spring-actuated arm and connections with the door, an axle to which said arm is secured, a liquid-cup into which said axle extends, wings connected with said axle and arranged in said cup, and valve-provided partitions between which said wings are arranged to operate, combined and arranged substantially as and for the purpose hereinbefore set forth.

3. In a door-check, a spring-actuated arm,

a bracket adapted to be affixed to the door, a link or rod connected with said arm and bracket by means of ball-and-socket joints, an axle to which said arm is secured, a liquid-cup into which said axle extends, wings connected with said axle and arranged in said cup, and valve-provided partitions between which said wings are arranged to operate, combined and arranged substantially as and for the purpose set forth.

4. In a door-check, the combination, with the spring-actuated arm *m* and its connections with the door, and the axle *f*, provided with the wings *v*, having apertures *w*, valves *x*, and springs *y*, controlling said valves, of the combined spring-casing and liquid-cup, the latter provided with the partitions *s*, having the apertures *t* and clapper-valves *u*, substantially as set forth.

5. In a door-check, a valve and its support provided with an aperture or port, the valve being pivoted to the support, in combination with a spring composed of the metals 2 3, one end of said spring being rigidly held and the other connected with said valve, substantially as and for the purpose set forth.

6. In a door-check, the combination, with the liquid-cup, of the apertured wing and its actuating mechanism, a valve pivoted to said wing and adapted to operate over the aperture therein, and a spring composed of the metals 2 3, one end of said spring being secured to said wing and the other end connected with said valve, as set forth.

7. In a door-check, a spring-actuated arm and its connections with the door, combined with a liquid-cup, an axle or spindle connected with said arm and extending into said

cup, wings connected with said axle for acting upon the liquid in said cup, said axle or spindle being provided with a longitudinal hole or aperture and lateral apertures communicating with said longitudinal aperture, and a stopple-rod or plunger arranged in said longitudinal hole or aperture, as set forth.

8. A door-check embracing in its construction a cylinder adapted to hold suitable liquid, an oscillatory shaft in the said cylinder, a partition in the said cylinder extending parallel with the said shaft, a wing or piston attached at right angles to the said shaft to operate on the liquid, and a suitable port to permit the flow of liquid as the shaft is oscillated, as set forth.

9. A door-check embracing in its construction a cylinder, an oscillatory shaft in the said cylinder, a partition extending at right angles to the shaft dividing the cylinder into two apartments, one of which is adapted to hold suitable liquid, a partition in the said liquid-apartment extending parallel with the said shaft, a wing or piston in the liquid-apartment attached at right angles to the said shaft to operate on the liquid, a suitable port to permit the flow of liquid as the shaft is oscillated, and a spring in the other apartment connected with the said shaft, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 26th day of March, A. D. 1889.

EUGENE I. BLOUNT.

Witnesses:

ARTHUR W. CROSSLEY,
A. D. HARRISON.