

No. 841,608.

PATENTED JAN. 15, 1907.

R. ADAMS.
DOOR CLOSER.

APPLICATION FILED JUNE 28, 1904.

5 SHEETS—SHEET 1.

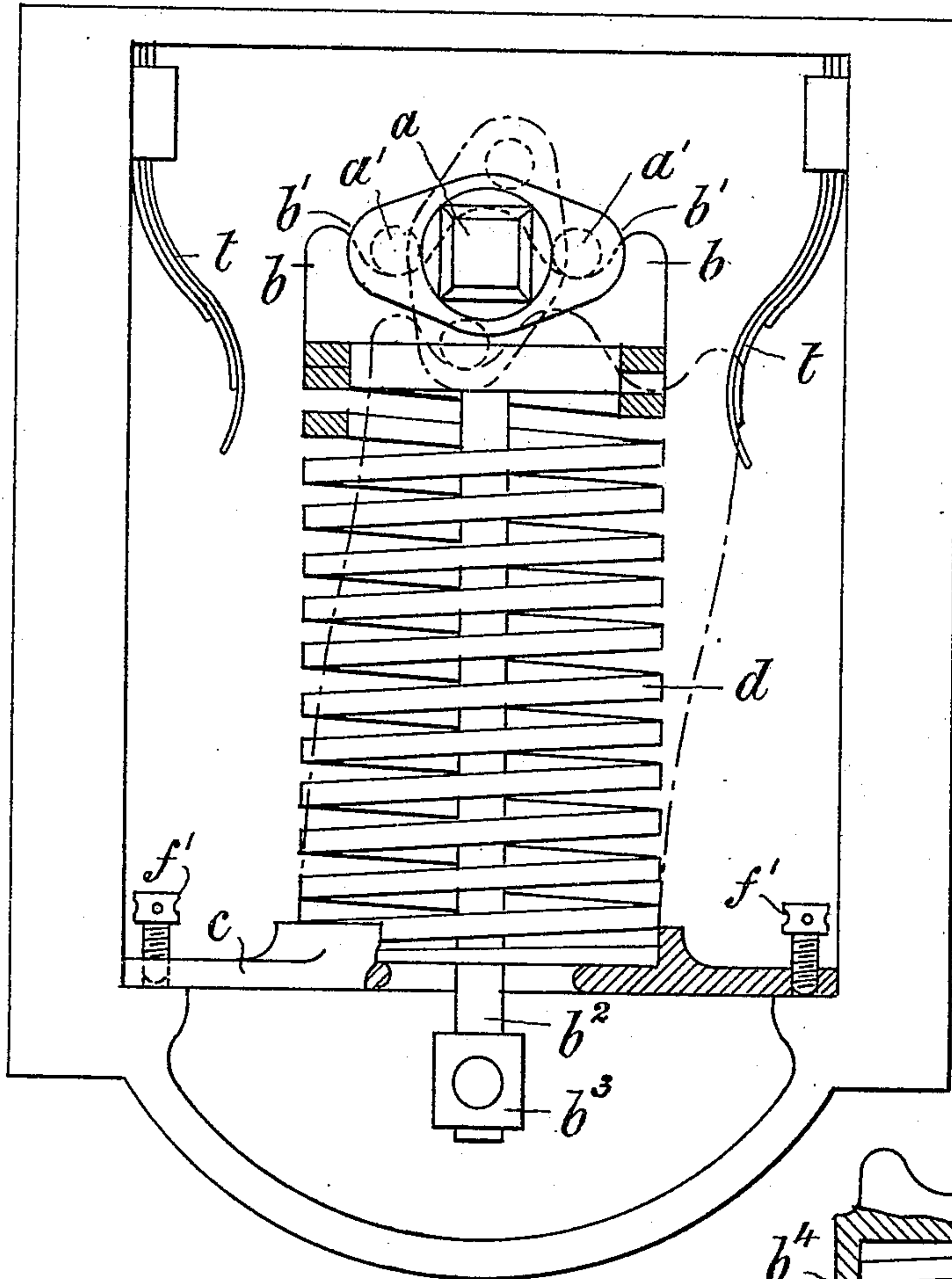


FIG. 1.

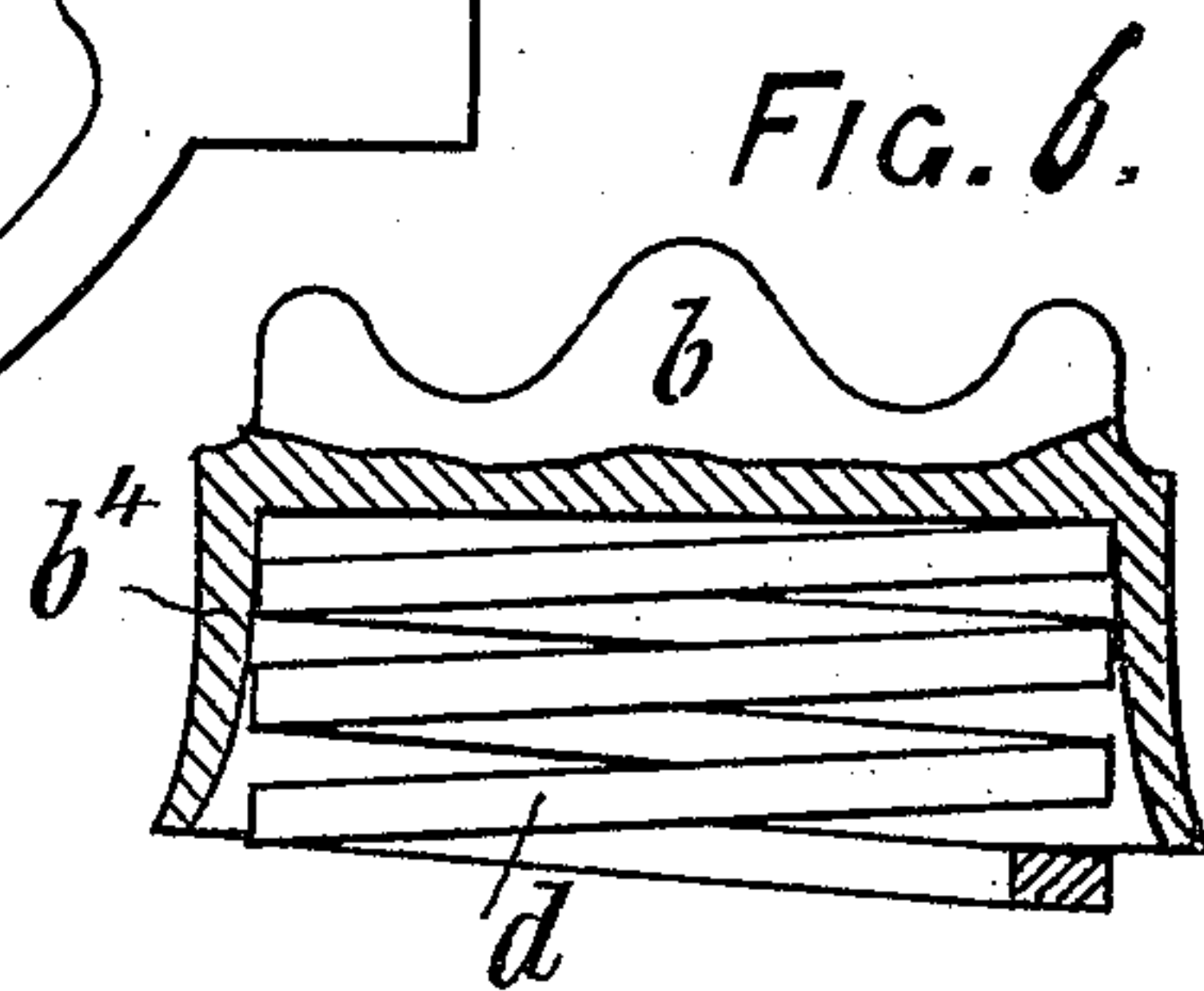


FIG. 6.

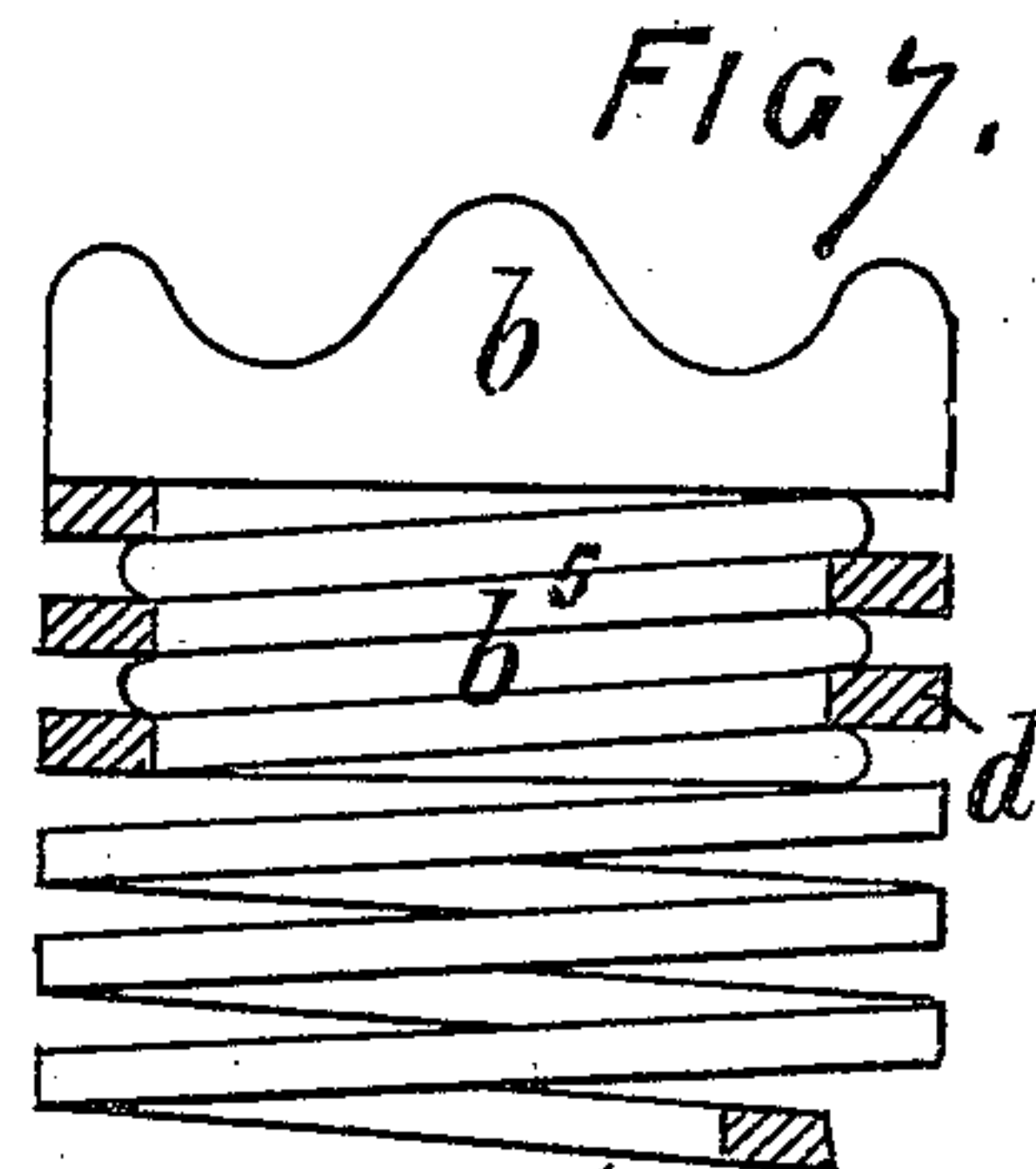


FIG. 7.

Witnesses;
James L. Norris, Jr.
C. H. Hester,

Inventor
Robert Adams
By James L. Norris
Att'y.

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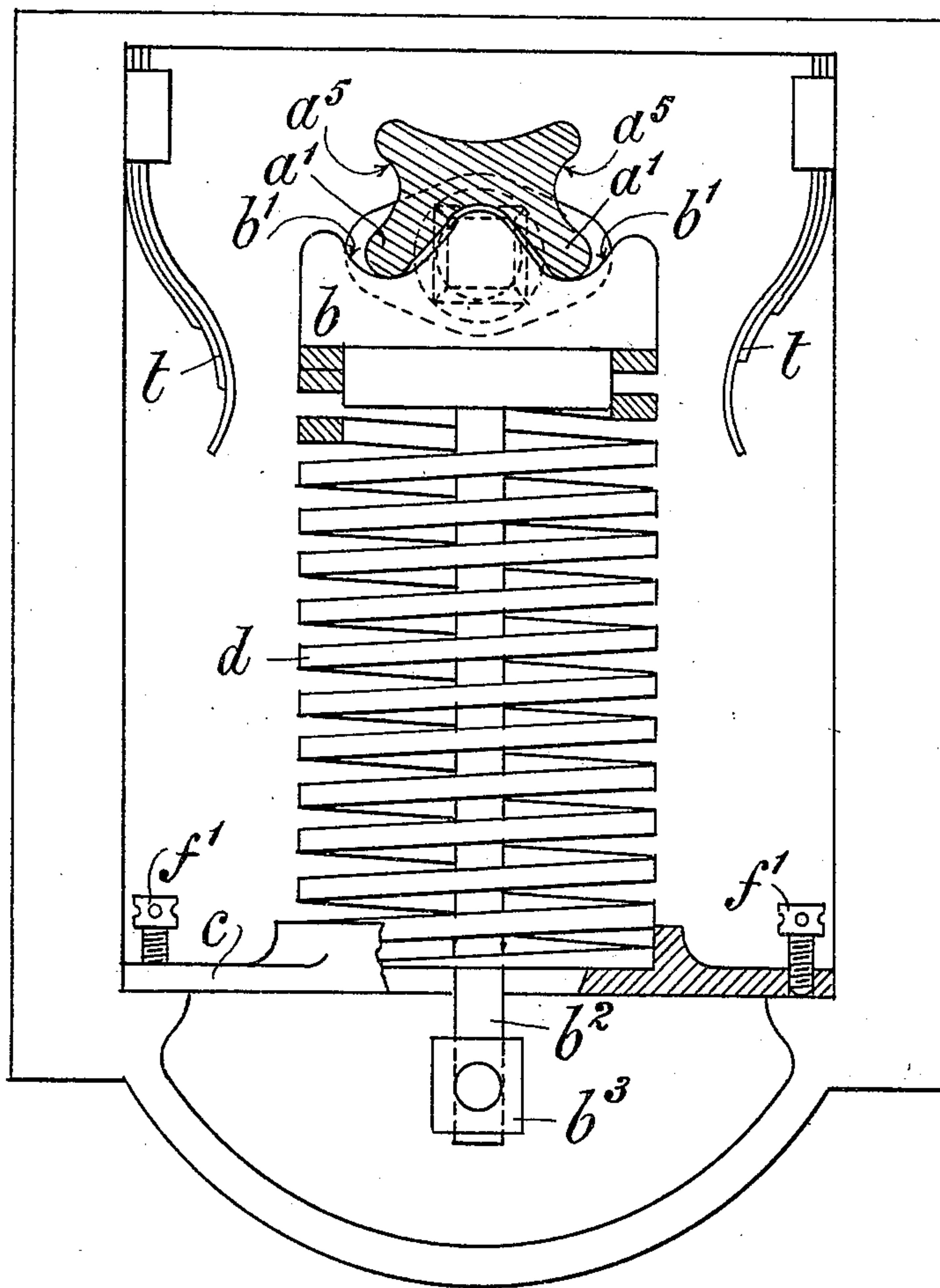
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5 SHEETS—SHEET 2.

FIG. 2.



Witnesses:
C. D. Kessler
F. O. Parker

Inventor
Robert Adams
By
James L. Norris
Att'y

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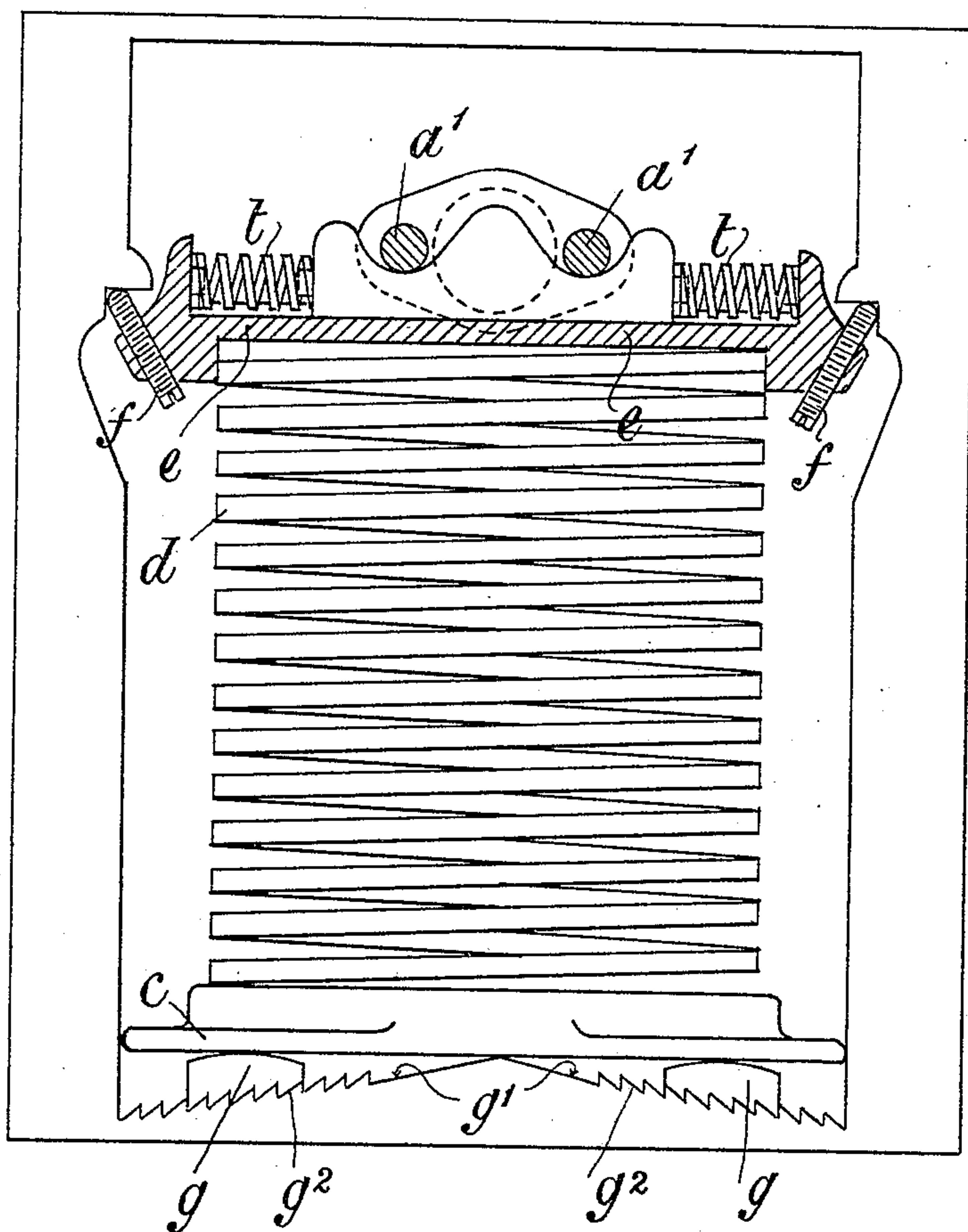
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5 SHEETS—SHEET 3.

FIG. 3.



Witnesses:

C. D. Kesler
F. O. Parker

Inventor

Robert Adams

By James L. Norrie

Att'y

No. 841,608.

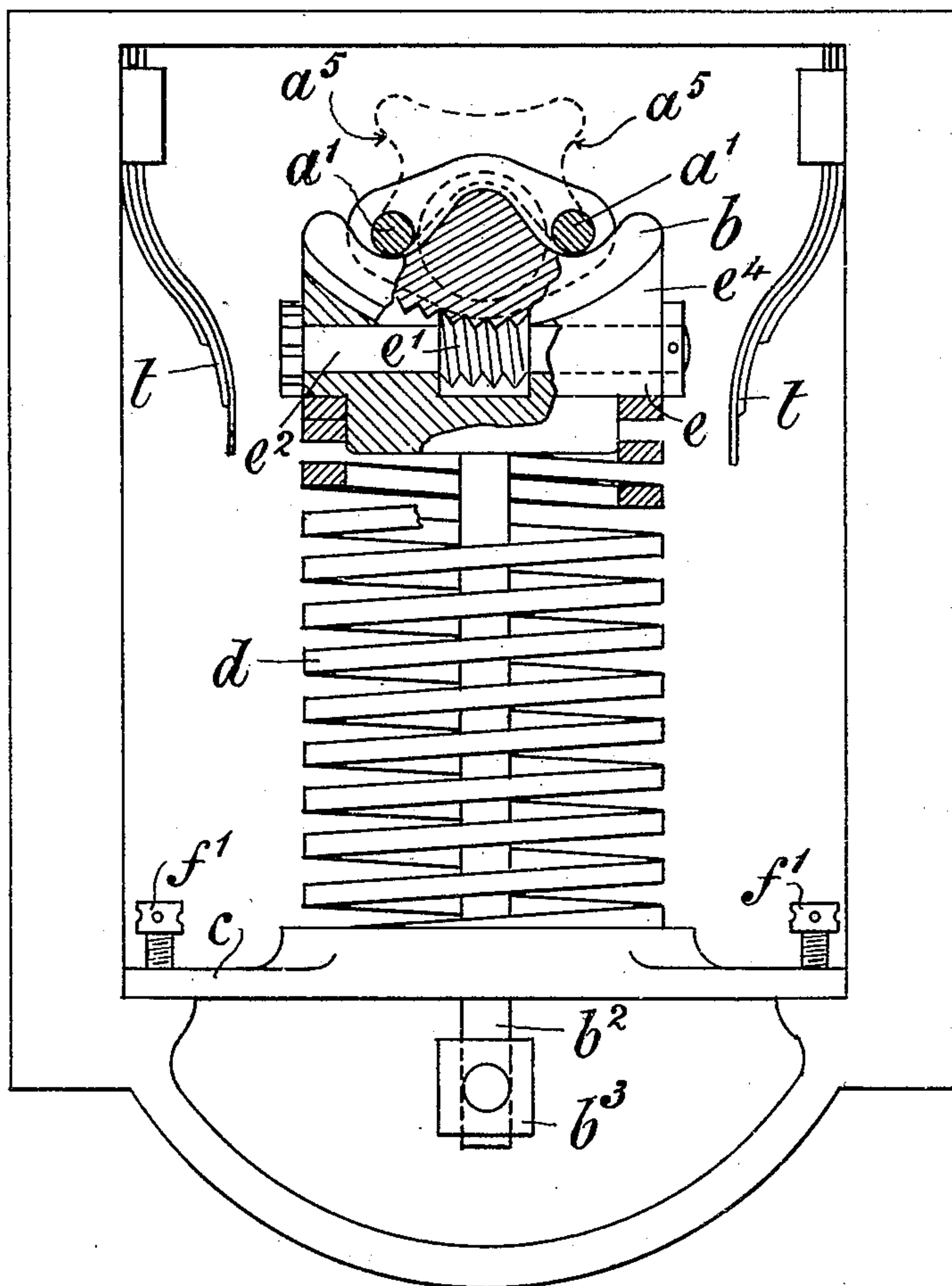
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5 SHEETS—SHEET 4.

FIG. 4.



Witnesses
C. D. Kester
F. O. Parker

Inventor
Robert Adams
By James L. Norris.
att'y

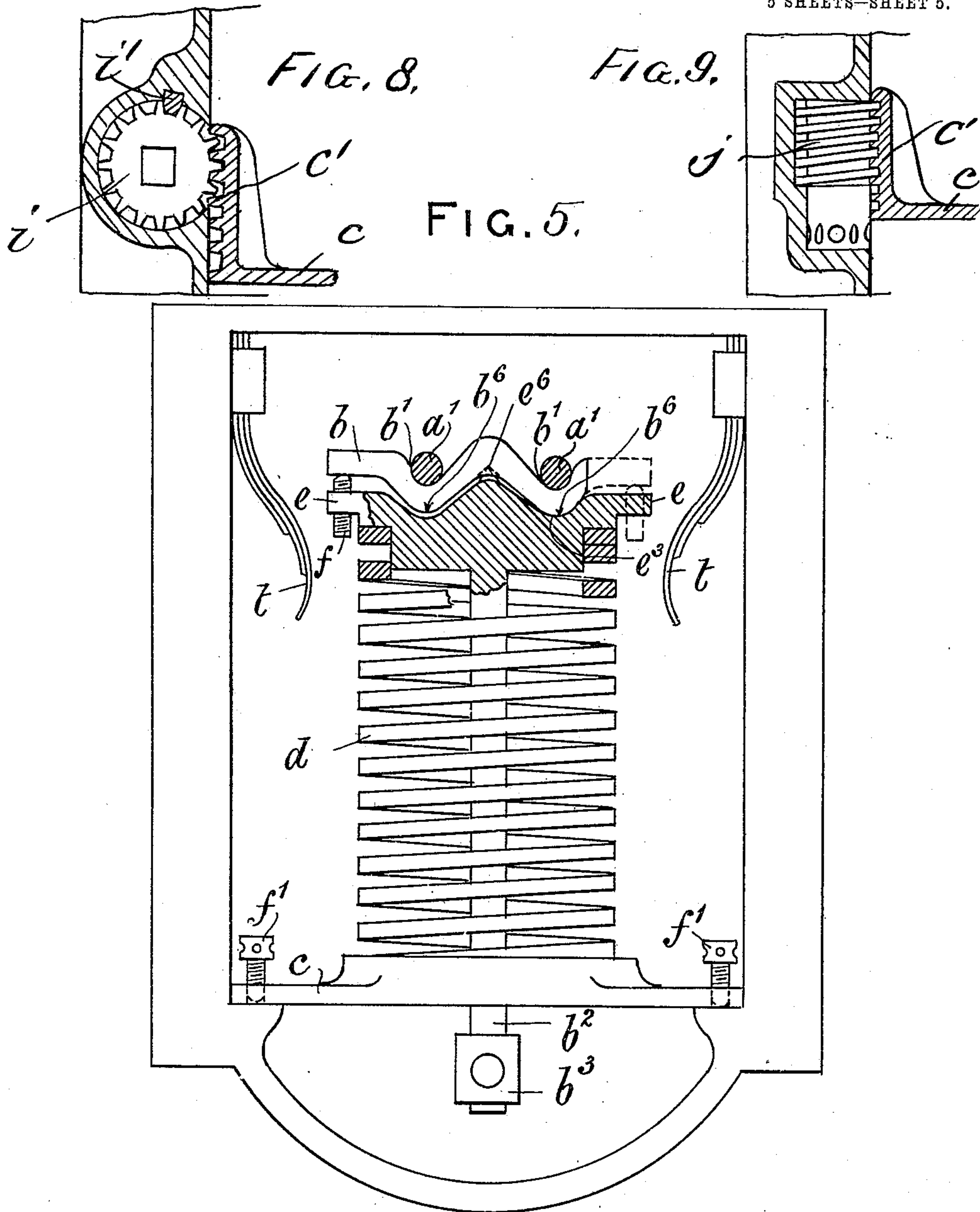
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5 SHEETS—SHEET 5.



Witnesses:
C. D. Kesler
F. O. Parker

Inventor
Robert Adams
By James L. Norris
Atty

UNITED STATES PATENT OFFICE.

ROBERT ADAMS, OF LONDON, ENGLAND.

DOOR-CLOSER.

No. 841,608.

Specification of Letters Patent.

Patented Jan. 15, 1907.

Application filed June 28, 1904. Serial No. 214,524.

To all whom it may concern:

Be it known that I, ROBERT ADAMS, engineer, a subject of the King of Great Britain, residing at 67 Newington Causeway, London, England, have invented certain new and useful Improvements in Door-Closers, of which the following is a specification.

The object of my invention is to effect improvements in or relating to single and double acting door-springs; and it consists in simplifying the construction and reducing friction in action and the amount of workmanship necessary in finishing and assembling the various parts.

By my improvements the cost of production of such articles is reduced, while providing for all the necessary adjustments and retaining and improving the general efficiency of the more expensive arrangements.

According to my invention I utilize the transverse or lateral resilience or buckling power of helical or spiral springs as well as the axial or longitudinal power thereof to assist in starting the closing action of the door, or, as an auxiliary, I provide other springs for a like purpose.

In the accompanying drawings, Figures 1, 2, 3, 4, and 5 illustrate door-springs in which the transverse resilience or buckling power of the spring is utilized as well as the axial power. Figs. 6 and 7 are detail views of modifications. Figs. 8 and 9 illustrate devices for adjusting the compression of the spring and (or) securing alinement of the door.

Referring to Figs. 1 and 2, I provide the pivot *a* of a double-action spring, for instance, with a pair of pins, studs, rollers, or the like *a'*, (hereinafter preferably designated "pins,") adapted to engage recesses *b'* in a plate or bar *b*, between which and the fence-plate *c* or its equivalent the spring *d* exerts its force. *t* indicates auxiliary springs which assist in starting the closing action, being compressed (as indicated by dotted lines in Fig. 1) by the oscillation of the plate or bar *b* as the door approaches the right angle. The recessed plate or bar may be integral with a guide-rod *b²*, the tail end of which slides in a pivoted socket *b³*, or, as shown in Fig. 3, the recessed plate or bar *b* may be arranged to slide upon an action-plate *e*, fixed or fitted to the spring *d*, or the recessed plate *b* may be fixed or fitted to the spring *d*, as shown, for example, in Figs. 7 and 8, the former showing a cap *b⁴*, surround-

ing the upper end of the spring *d*, and the latter showing the spring *d* as screwed onto a worm-spigot end *b⁵* of the plate *b*; but the spigot end may be used without the worm thereon. Preferably I make use of an elliptical spiral spring, as shown in Fig. 6, or other suitable arrangement of spring, so that only one side thereof is compressed at a time, the side depending upon the direction in which the door is opened.

To adjust the spring in order to secure alinement of the door and (or) to increase its resistance as required, I form the action-plate (or the fence-plate or its equivalent) in two parts, as shown in Fig. 4, one part *e* being formed with a segmental curved recess or guide *e⁴*, adapted to accommodate the segmental curved base of the other part *b*. The latter is formed with teeth arranged to be acted upon by a worm *e'*, fixed upon a spindle *e²*, mounted in the former, in such a manner that by rotating said spindle the segmental portion is moved in the recess, thus imparting a more or less angular position thereto, and thereby compressing one side of the spring more than the other. Also for a similar purpose I may provide the action-plate with a screw *f*, Fig. 3, at one or both ends thereof, adapted to impinge against the wall of the box (or vice versa) by screwing or unscrewing, which causes the plate to assume a more or less angular position in the box, thus compressing one side of the spring slightly more than the other, and consequently setting the door to the desired alinement.

In some cases I form the action-plate in two parts, as illustrated in Fig. 5, one part *b* being formed with the two recesses *b'* for the pins *a'* of the pivot and the other part *e* being in contact with the spring and recessed at *e³* to engage corresponding protuberances *b⁶* on the first-mentioned part *b*, whereby under the power of the spring the two parts are prevented from moving out of their correct relative positions, or the part *b* may be fulcrumed or pivoted centrally, as indicated at *e⁶*, (dotted lines,) or at one end. In such cases the screw *f* for adjusting the alinement of the door passes through the end of one plate and impinges against the end of the other, as shown, thereby causing the plates to assume an angular position with one another. The auxiliary springs, such as *t*, Figs. 1 to 5, may be employed to act upon the part or bar *b* or the action-plate *e*, ac-

ording to whichever is moved laterally across the box in the act of opening or closing the door.

Also I provide wedges *g*, as shown, by way of example, in Fig. 3, which are inserted between the base of the spring or its fence-plate *c* and an inclined surface *g'* on the box (or on the fence-plate) for the purposes of adjusting the power of the spring and by applying more power to one side of the spring than the other to secure the desired alinement of the door. The wedges may be moved by inserting a lever or by screws or by any other well-known device, and when so moved or adjusted said wedges may be locked in position by teeth *g*², keys *g*³, or by other means. Also I sometimes form the fence-plate *c* with a rack *c'* at right angles thereto, Fig. 8, in gear with a pinion *i*, mounted in the box and provided with suitable stops, pawls, or the like. A key-pin *i'* is shown in Fig. 8. The rack may be operated by the application of a lever, or the pinion may be rotated by a key. Similarly I may employ a worm *j*, Fig. 9, to act upon the rack *c'*, the worm being operated by a lever or key, or instead of these devices I may employ screws and nuts for a similar purpose, screws *f'* being shown in Figs. 1 to 5.

A recess *a*⁵ is formed on the pivot to act upon the bifurcated end of the plate *b* in order that when the door is moved past the right angle the power of the spring continues to act to close the door, as shown in Figs. 1, 2, and 4.

It will be obvious that the before-mentioned extra recess in the spring or action-plate and extra pin on the pivot, or vice versa, may be applied to any of the first-mentioned door-closing appliances.

I claim—

1. In a door-closing appliance, the combination of a door-pivot, a fence-plate, a spring, means for fixing one end of said spring relatively to said fence-plate, a recessed plate fitted to the other end of said spring, means on

said door-pivot engaging the recess of said recessed plate adapted to compress the spring and deflect the upper end thereof laterally when said pivot is rotated by the door, and an auxiliary spring to assist in starting the closing action, as set forth.

2. In a door-closing appliance, the combination of a door-pivot, a fence-plate, a spring, means for fixing one end of said spring relatively to said fence-plate, a recessed plate fitted to the other end of said spring, a pair of pins on said door-pivot adapted to engage the two recesses in said recessed plate, and a pair of auxiliary springs, as set forth.

3. The combination with a door-pivot provided with a pair of pins, a spring, a fence-plate fixed to said spring, a pair of auxiliary springs, and a recessed plate engaging said pins, of an adjusting device adapted to set the said recessed plate at an angular position, as set forth.

4. The combination with a door-pivot formed with a pair of pins, a spring, a fence-plate fixed to said spring, a recessed action plate fixed to the other end of said spring, and a pair of auxiliary springs, of an adjusting device fitted in connection with said fence-plate whereby to set up said fence-plate with regard to its position in the box, as set forth.

5. The combination of a door-pivot, a spring, a fence-plate fixed to said spring, an action-plate secured to said spring, and an eccentrically-arranged engagement on said pivot meshing with a corresponding engagement on said action-plate adapted to continue the compression and distortion of the spring beyond the right-angled opening of the door, as set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ROBERT ADAMS.

Witnesses:

GEORGE C. DOWNING.
WALTER J. SKERTEN.