

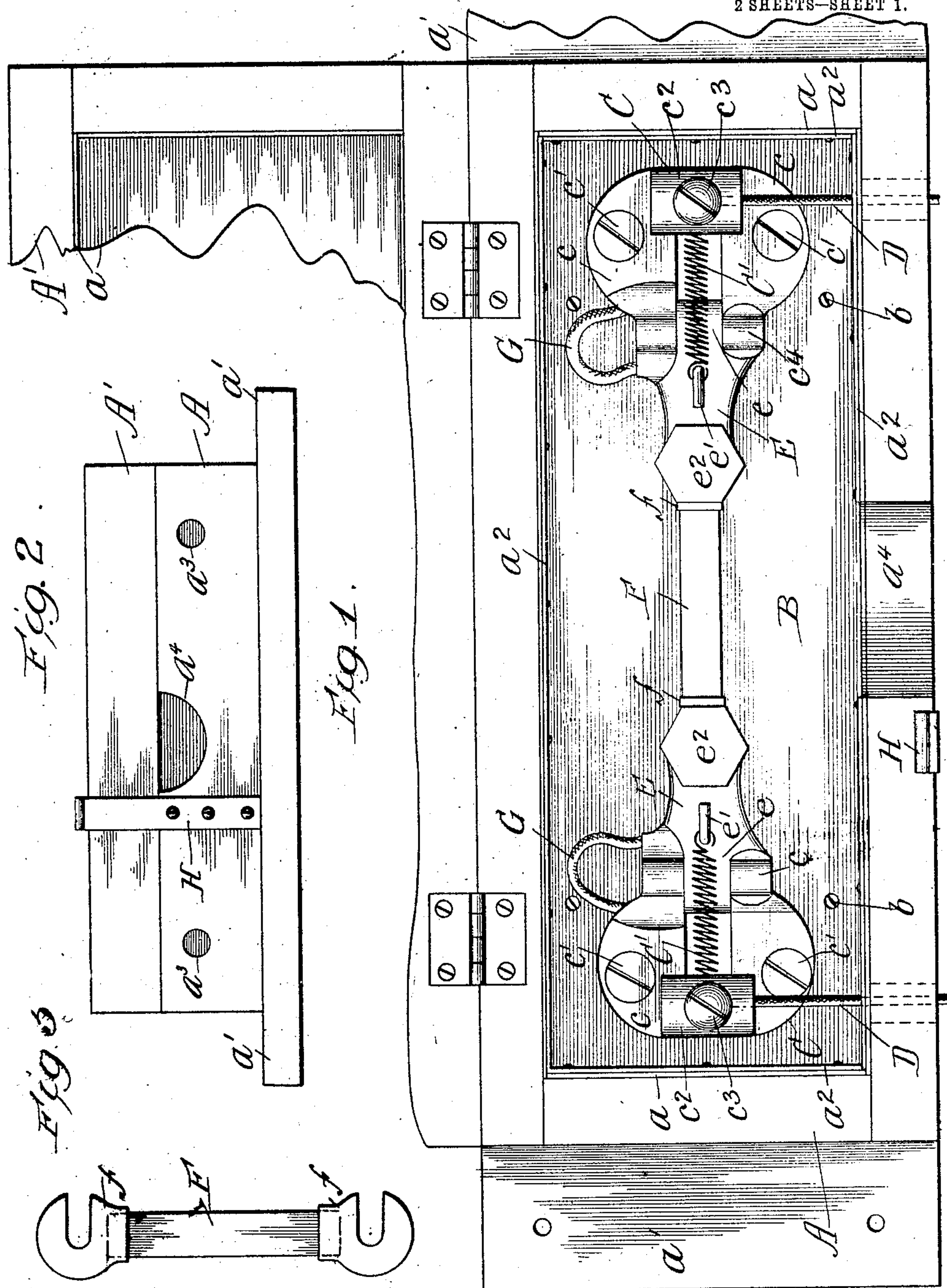
No. 850,334.

PATENTED APR. 16, 1907.

S. C. ANDERSON & C. H. FRENBERG.
AUTOMATIC CUT-OUT OR FUSE BOX.

APPLICATION FILED OCT. 18, 1906.

2 SHEETS—SHEET 1.



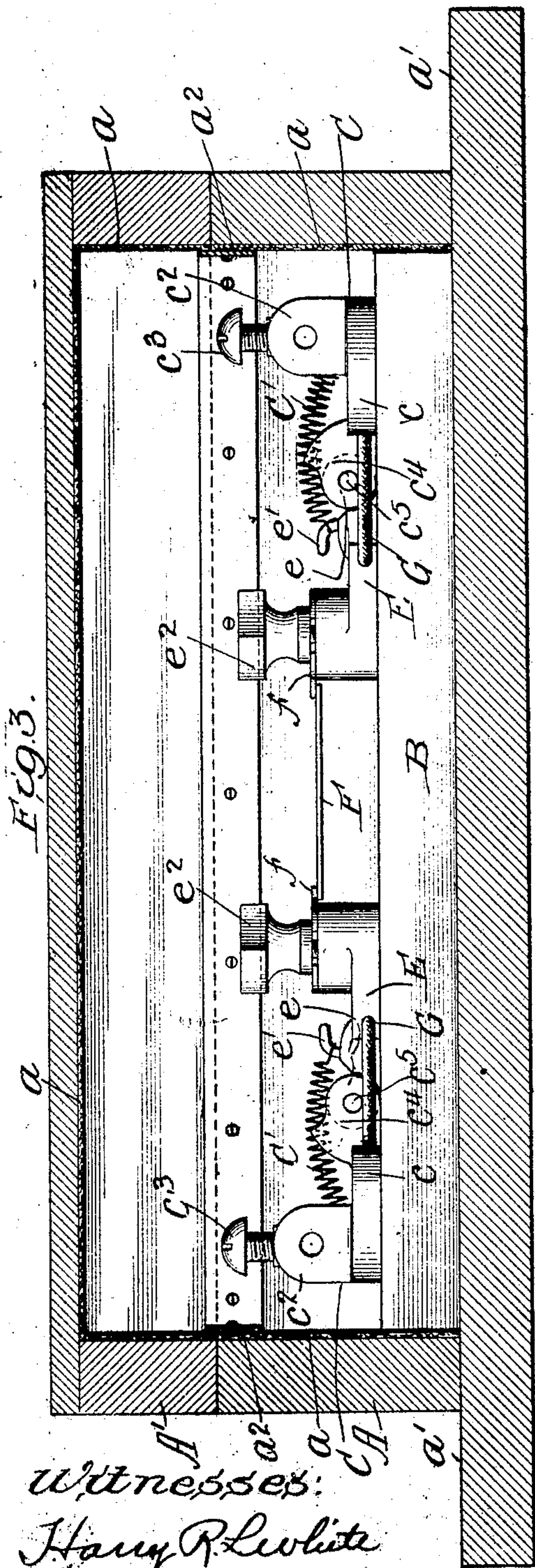
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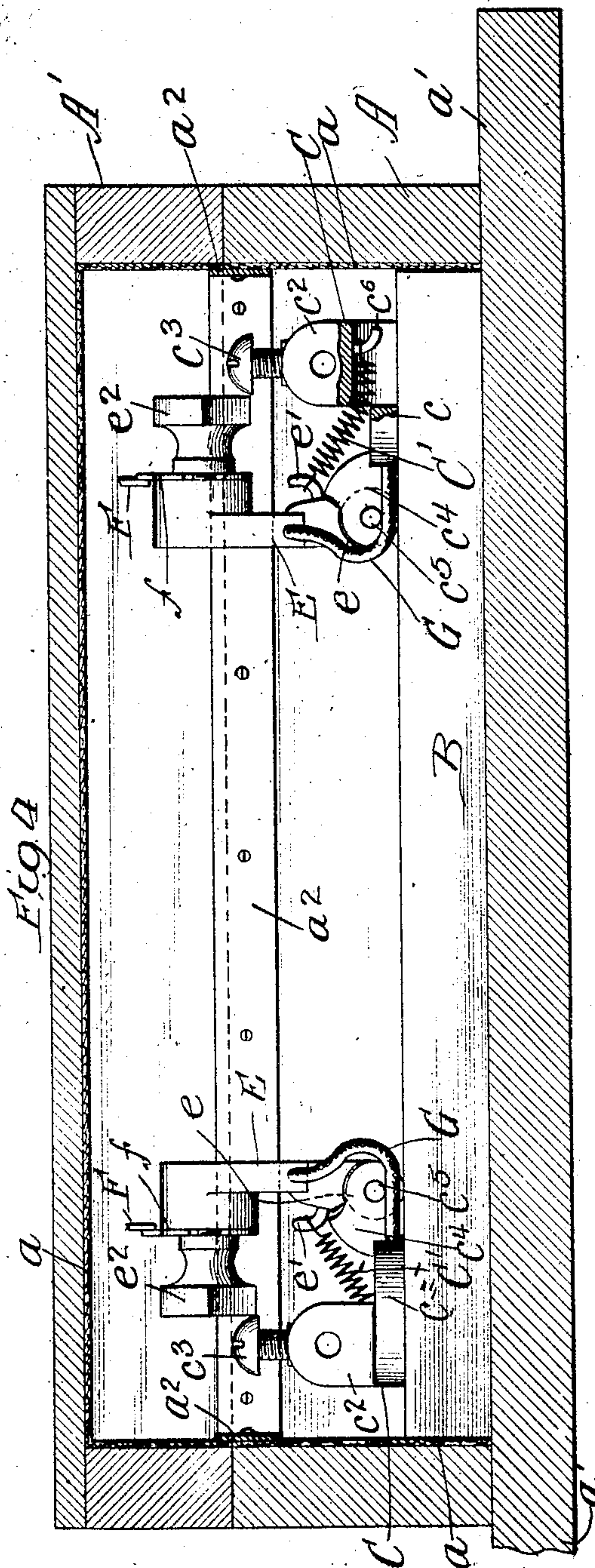
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

SWAN C. ANDERSON, OF OAK PARK, AND CHARLES H. FRENBERG, OF CHICAGO, ILLINOIS.

AUTOMATIC CUT-OUT OR FUSE-BOX.

No. 850,334

Specification of Letters Patent.

Patented April 16, 1907.

Application filed October 18, 1906. Serial No. 339,460.

To all whom it may concern:

Be it known that we, SWAN C. ANDERSON and CHARLES H. FRENBERG, citizens of the United States, residing, respectively, at Oak Park and Chicago, both in the county of Cook and State of Illinois, have invented a new and useful Improvement in Automatic Cut-Outs or Fuse-Boxes, of which the following is a complete specification.

10 This invention relates to automatic cut-outs or fuse-boxes, and more particularly to an automatic cut-out for electric circuits and of that class in which the current is broken by the fusion of a fusible link or fuse.

15 Heretofore in devices of this class, especially where used in heavy currents, such as in electric-car service, when a fuse blows out there is a great tendency to form an arc, and to prevent this a magnet is oftentimes so connected in the circuit as to throw a strong magnetic field across the space occupied by the fuse and which acts to blow out the arc. While this method is successful in preventing arcing, it is objectionable because of the liability of the coil to become short-circuited, in which case it not only causes the fuses to blow out repeatedly because of the heat generated, but also oftentimes sets fire to the fuse-box and destroys it. Furthermore, such devices are comparatively costly, and where the coil is placed in a compartment beneath the fuse it is so difficult to replace it that the car must be returned to the barn to make the necessary repairs.

35 The object of this invention is to provide an automatic cut-out adapted to instantaneously break the circuit when the current has reached a predetermined strength and which is capable of preventing an arc being formed at the break without the use of a magnetic coil.

45 It is also an object of the invention to provide a very cheap and simple automatic cut-out in which a slight tension is exerted on the fuse to enable it to break as soon as its temperature reaches its fusion-point, thereby preventing the whole fuse from fusing and greatly reducing the force usually accompanying the blowing out of the fuse.

50 It is a further object of the invention to provide a non-combustible and moisture-proof fuse-box which is provided with sufficient vent-apertures to permit the escape of

the gases created by the blowing out of the fuse without forcing the box open.

The invention consists in the matters hereinafter described and more fully pointed out and defined in the appended claims.

In the drawings, Figure 1 is a fragmentary top plan view of a device embodying our invention and showing the cover open. Fig. 2 is a reduced side elevation of the same. Fig. 3 is a fragmentary longitudinal section of the box and showing the cut-out mechanism closed and in side elevation. Fig. 4 is a similar view showing the fuse blown out and the cut-out open. Fig. 5 is a plan view of the fuse.

As shown in said drawings, the casing is represented by A and may be constructed of any preferred material, but as shown is constructed of wood and is provided with an inner lining *a* of asbestos or other non-combustible material. The base *a'* of said casing is extended beyond the end walls thereof and is provided with screw-apertures to enable the device to be attached to the car or other support. Engaged on the inner side of the casing, near the top thereof, and extending above the margins of the walls is a strip of metal or other preferred material affording a flange *a''*, over which the cover *A'*, which is hinged to the side wall, fits closely and provides a practically moisture-proof joint.

Within the casing and covering the bottom of the same is a slab B of slate or other non-combustible insulating material, which is rigidly engaged in place by means of screws *b*. Rigidly engaged adjacent each end of said slab and out of contact with the walls of the casing are the binding-posts C for the trunk-wires D. Each of said posts, as shown, consists of a plate *c*, which is rigidly engaged to said slab B by means of screws *c'* and is provided at its outer end with a raised lug or boss *c''*, having a transverse aperture therethrough to receive the trunk-wire D and having a screw-threaded aperture opening into said transverse aperture and adapted to receive the binding-screws *c'''* for the trunk-wire. Said plates *c*, as shown, are provided at their adjacent sides with a pair of apertured knuckles *c⁴*, between which fits a complementary knuckle *e* of a hinged fuse binding post or plate E, and through said knuckles a pintle *c⁵* passes, forming a hinged

joint. The binding-posts C are provided with hooks c^6 at any convenient point thereon; but as shown said hooks are beneath the lugs c^2 , which are provided with a recess beneath the same for that purpose, and the hinged plates are provided with hooks c^7 , on which and on the hooks c^6 are engaged coiled springs C' , which act normally to hold said plates E turned outwardly from the slab, as shown in Fig. 4. Each of said hinged posts or plates E is provided at its end opposite the hinge with a binding-screw e^2 , adapted to receive the ends of the fuse F, which may be of any desired construction, but which, as shown more clearly in Fig. 5, comprises a strip of readily-fusible metal having an attaching-car f at each end adapted to hook about the screws e^2 .

If preferred and as shown, a conductor G, of any suitable material, may be brazed or otherwise suitably connected at one end to the plate c and at the other end to the plate E to insure an uninterrupted current passing through the hinges.

The casing A, as shown more clearly in Fig. 2, is provided through one side, in alignment with the transverse apertures in the lugs c^2 , with apertures a^3 , through which the trunk-wires enter and leave the casing, and is provided opposite the fuse with an enlarged vent-aperture a^4 for the escape of gases when the fuse blows. A spring-clasp H of any desired kind is engaged on the front of the casing and hooks over the cover when closed and acts normally to hold the cover in closed position.

The operation is as follows: When in use, the hinged plates E E lie flat on the slab B, as shown in Figs. 1 and 3, and are held in such position against the tension of the springs C' by the fuse, which is engaged beneath the binding-screws e^2 . When the current becomes strong enough to melt the fuse, the hinged plates are thereby released and are immediately swung oppositely by the action of the springs, thereby increasing the distance between the terminals of the fuse and preventing an arc. Inasmuch as the springs are at all times exerting some tension on the fuse, as soon as the heat becomes intense enough to melt it it is severed, thereby preventing its complete fusion and greatly diminishing the force of the blow-out. When it is desired to insert a new fuse, the current is thrown off and the spring-plates again forced into alignment and the fuse secured beneath its screws. Inasmuch as there is no blow-out coil employed, the danger of short-circuiting is entirely obviated, while arcing is prevented by the space between the terminals being increased to such an extent that an arc cannot form.

We claim as our invention--

1. In a device of the class described the combination with rigid plates adapted to re-

ceive trunk-wires, of a plate hinged to each and adapted to extend longitudinally thereof intermediate the same, and a fuse connected in said last-named plates.

2. In a device of the class described the combination with a pair of rigidly-fixed plates adapted to receive trunk-wires, of a plate hinged to the inner edge of each and adapted to normally extend longitudinally thereof intermediate the fixed plates, a fuse engaged on said hinged plates and springs engaged at one end on said fixed plates and at the opposite end on said hinged plates and adapted to normally exert their tension approximately longitudinally of said plates.

3. In a device of the class described the combination with trunk-wire binding-posts, of fuse binding-posts hinged thereon and adapted to lie in alignment therewith intermediate the same, a fuse connecting said last-named posts and means adapted to swing said posts oppositely when the fuse blows.

4. In a device of the class described the combination with binding-posts for the trunk-wire, of movable fuse binding-posts, a fuse connected in said last-named posts and adapted to normally hold them in alignment with the aforesaid posts and intermediate the same, and means adapted to move said fuse binding-posts oppositely when the fuse blows.

5. In a device of the class described the combination with an insulating-slab of binding-posts rigidly engaged thereon and adapted to receive trunk-wires, fuse binding-posts hinged longitudinally thereof and adapted to be turned upwardly from said slab, a fuse connected in said last-named posts and springs connecting said trunk-wire binding-posts with the fuse binding-posts and adapted to turn said fuse binding-posts at an angle with the trunk-wire binding-posts and prevent an arc when the fuse blows.

6. In a device of the class described the combination with an insulating-slab of a plate rigidly engaged near each end thereof and each having an apertured lug thereon adapted to receive a trunk-wire, a longitudinally-directed plate hinged on one edge of each of said plates and adapted to normally lie flat on the slab intermediate the same, a fuse connecting said hinged plates, and coiled springs extending longitudinally of said plates and engaged at their ends thereto and adapted to turn the hinged plates at an angle to the rigid plates when the fuse blows.

7. In a device of the class described the combination with a casing having a vent-aperture therein, of an insulating-slab rigidly engaged in said casing, a plate rigidly engaged on said slab, near each end thereof and each having an apertured lug thereon adapted to receive the trunk-wire, a swinging plate hinged on each of said rigid plates and adapted to normally lie in longitudinal alignment therewith in close contact with the slab, a

fuse connected to said swinging plates, a hook on each plate and coiled springs each having one end thereof engaged to the hook on said rigid plate and the other end thereof engaged to the hook on the swinging plate.

8. In a device of the class described the combination with a casing having a vent-aperture in one side thereof, of an insulating-slab in said casing, trunk-wire binding-posts rigidly engaged to said slab, fuse binding-posts hinged to the inner or adjacent sides of said trunk-wire binding-post and adapted to normally lie flat on said slab intermediate the trunk-wire binding-posts, a fuse connected with said fuse binding-posts, and resilient means attached at their ends to said plates and acting normally to swing said fuse binding-posts oppositely.

9. In a device of the class described the combination with a casing having a cover

hinged thereon and a plurality of apertures in one side thereof, a resilient clasp for said cover, an inner lining of non-combustible material in the casing, a slab of insulating material in said casing, trunk-wire binding-posts on said slab, oppositely-movable fuse binding-posts hinged thereto and adapted to normally lie in close contact with the slab, springs acting normally to raise said fuse binding-posts to a position perpendicular to the slab and a fuse connected in said fuse binding-posts.

In testimony whereof we have hereunto affixed our signatures in the presence of two witnesses.

SWAN C. ANDERSON.
CHARLES H. FRENBERG.

Witnesses:

W. W. WITHEBURY,
MATIE WITHEBURY.