

No. 670,932.

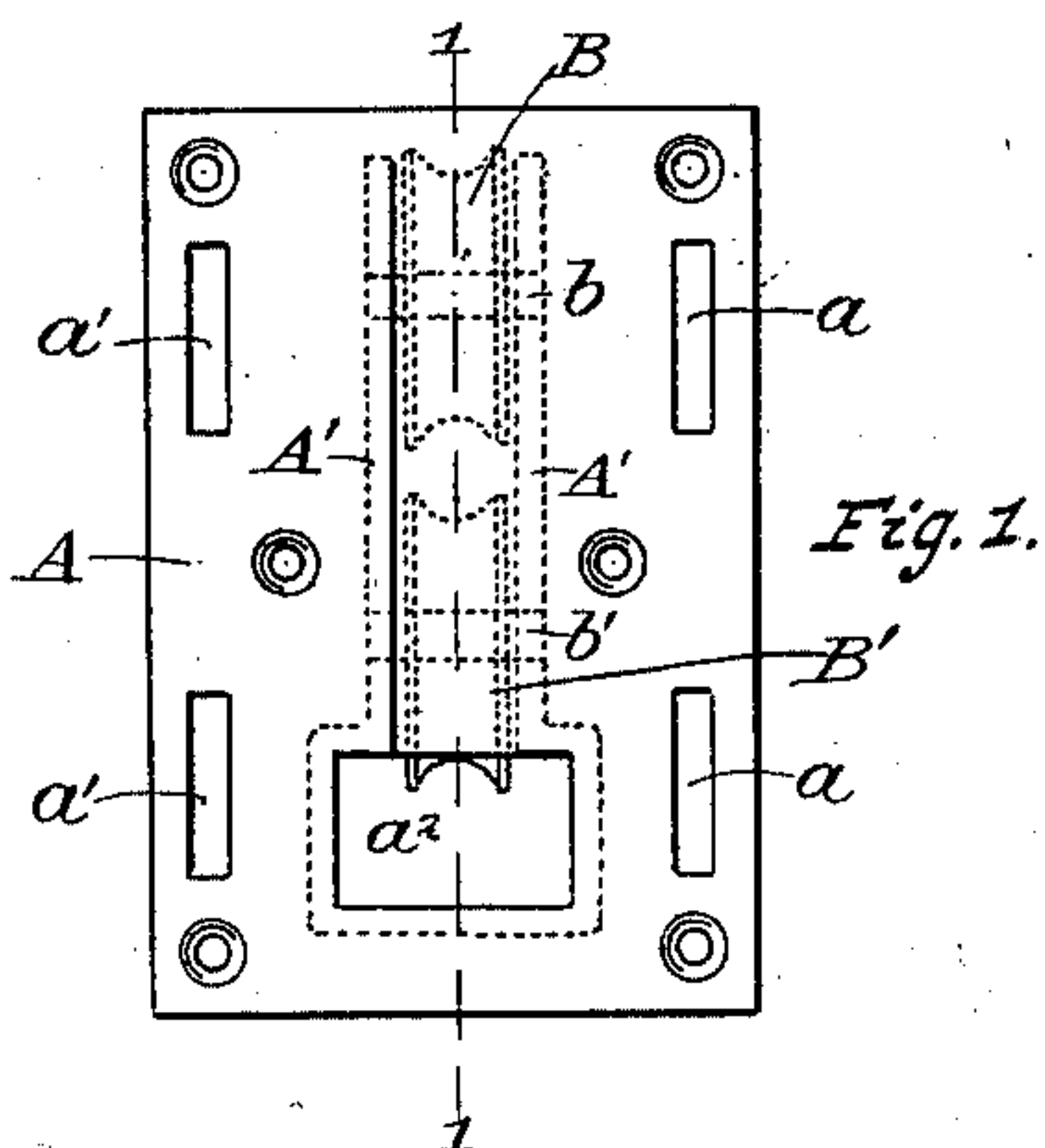
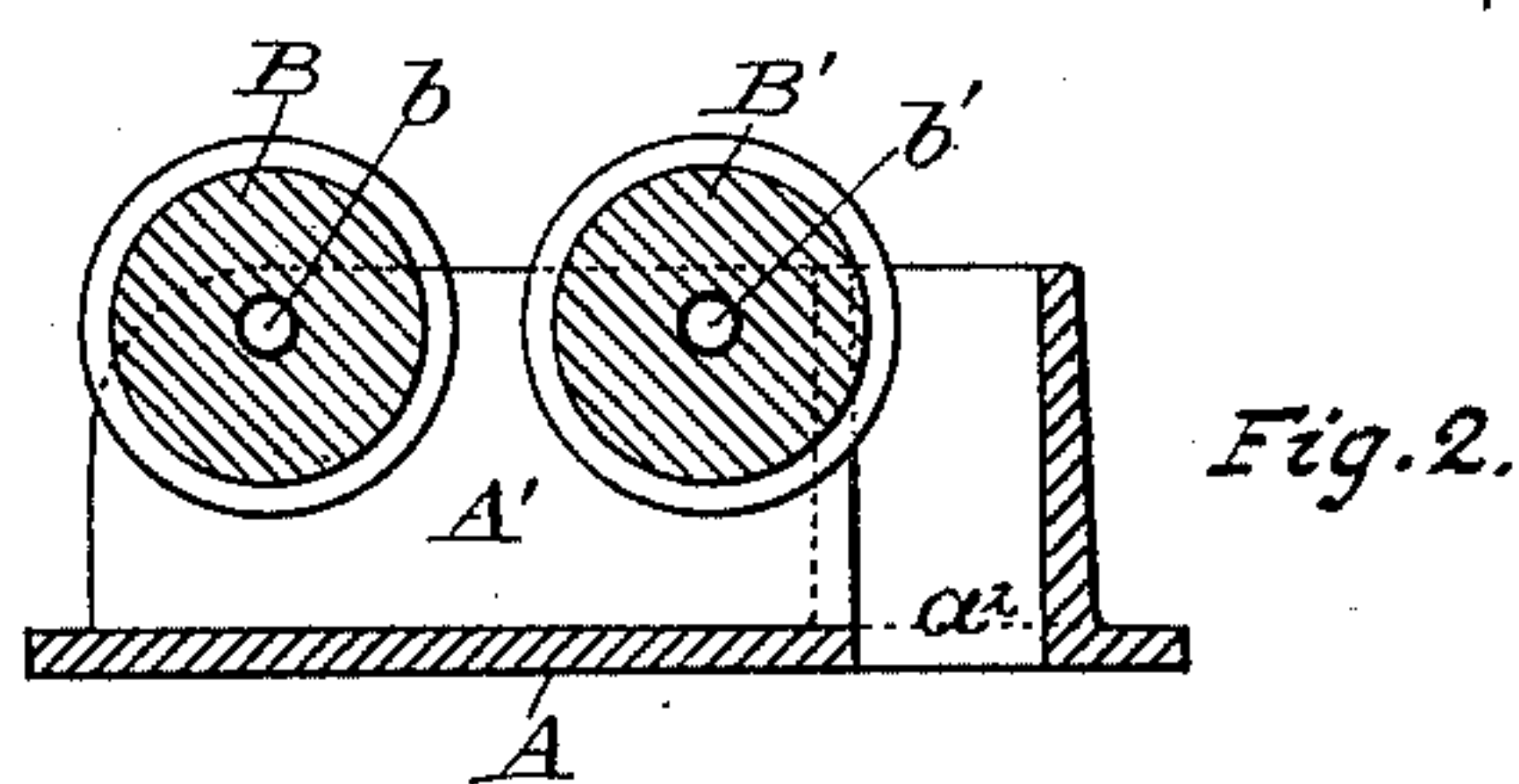
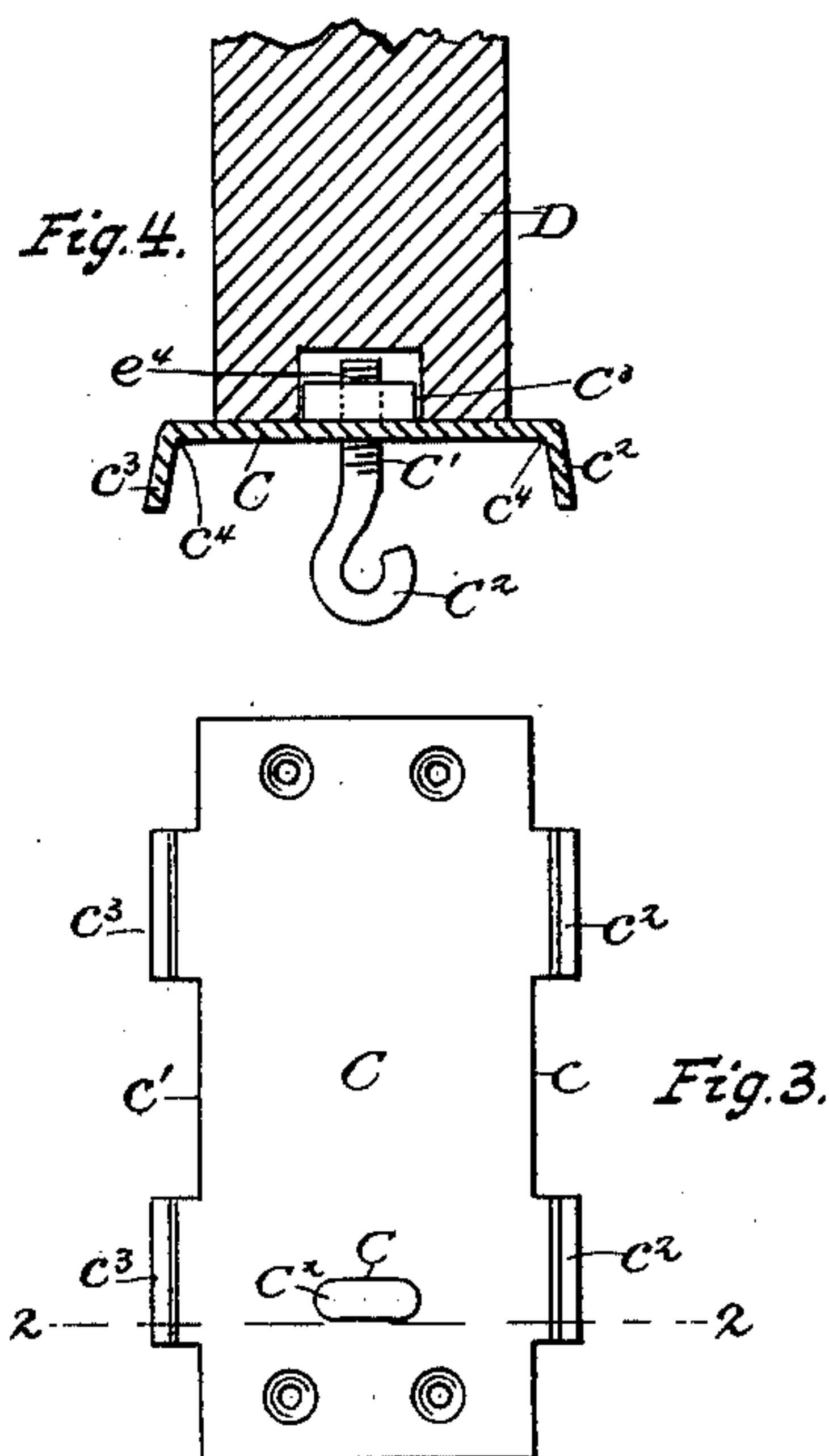
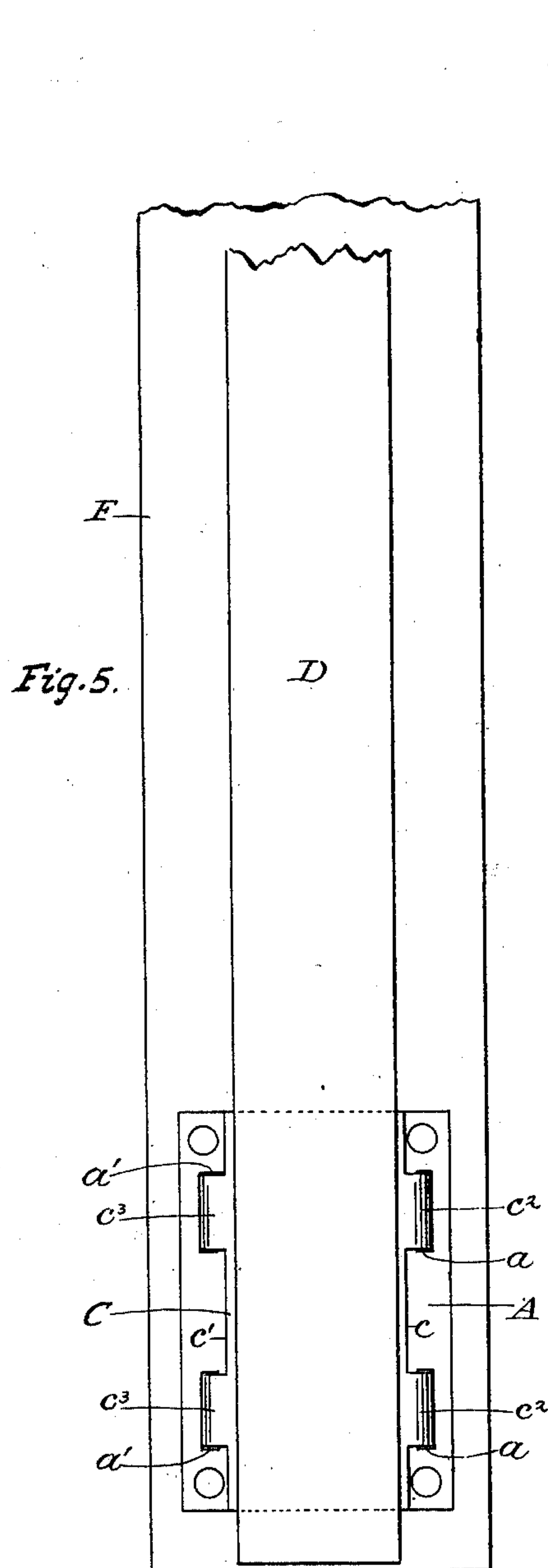
Patented Apr. 2, 1901.

F. D. HAMMOND.
DOUBLE ACTING SPRING HINGE.

(Application filed May 1, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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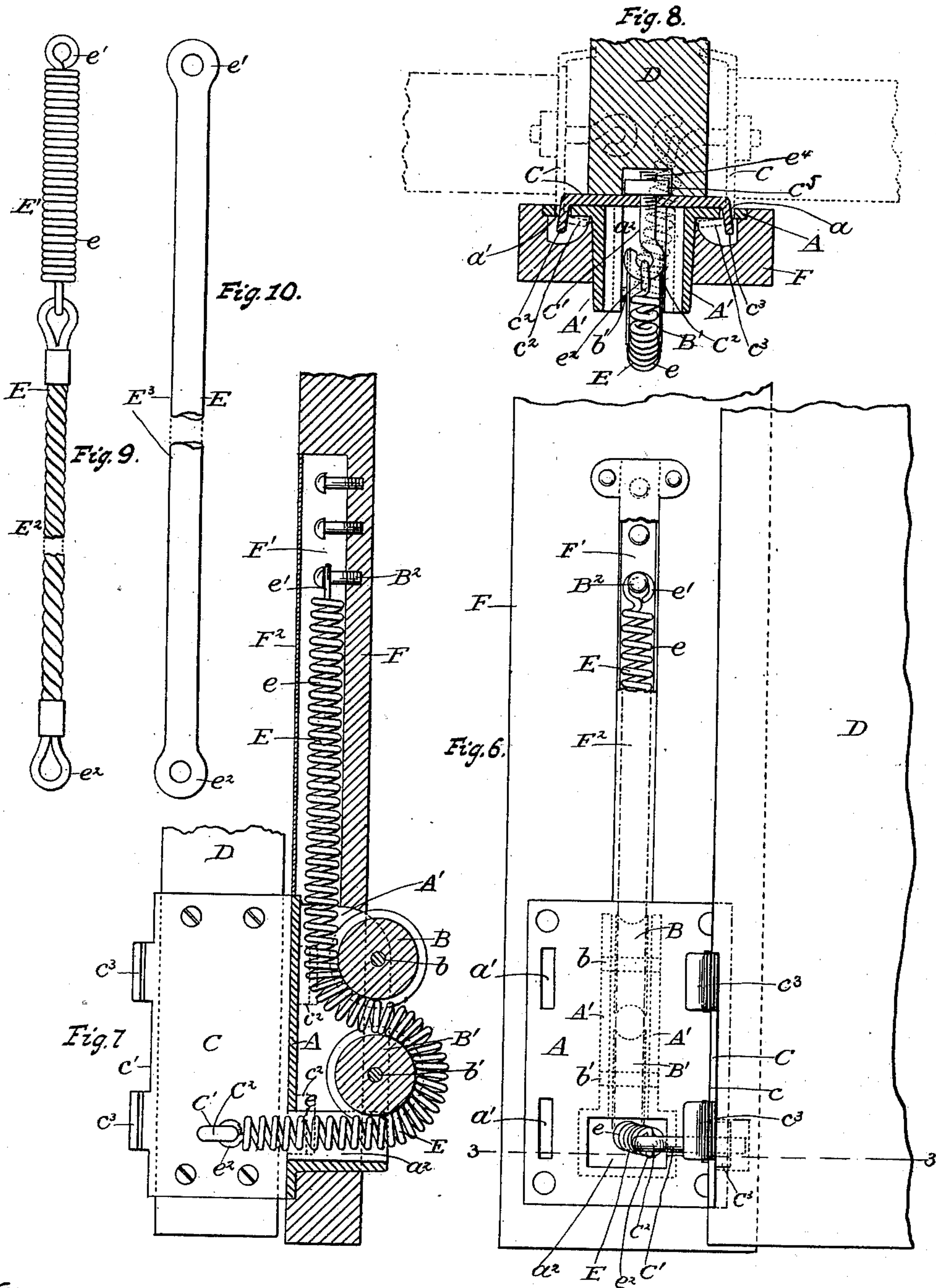
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UNITED STATES PATENT OFFICE.

FERNANDO D. HAMMOND, OF SANDYHILL, NEW YORK.

DOUBLE-ACTING SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 670,932, dated April 2, 1901.

Application filed May 1, 1900. Serial No. 15,032. (No model.)

To all whom it may concern:

Be it known that I, FERNANDO D. HAMMOND, a citizen of the United States, residing at Sandyhill, in the county of Washington and State of New York, have invented new and useful Improvements in Double-Acting Spring-Hinges, of which the following is a specification.

My invention relates to a double-acting spring-hinge; and it consists of certain novel features of construction and combinations of parts, as hereinafter set forth, and pointed out in the claims.

The object of my invention is to produce a double-acting spring-hinge which will comprise few parts, be simple in its construction, and obviate the use of pivoted knuckles and external springs, as heretofore used, and automatically operate to carry the door from an open position to a closed one and without noise. I attain this object by means of the devices and elements shown in the accompanying drawings in two sheets, forming a part of this specification, in which—

Figure 1 is a plan view of the door-frame plate. Fig. 2 is a section of the same, taken at line 1 in Fig. 1. Fig. 3 is a plan of the door-stile plate. Fig. 4 is a section of the same, taken at line 2 in Fig. 3 and applied to a door. Fig. 5 is a plan showing the two plates of the hinge in place, with the door-frame plate secured to the frame and door-stile plate secured to the swing-stile of a door and the door closed. Fig. 6 is a view showing the two plates in place with the door swung open to one side. Fig. 7 is a longitudinal section of the same. Fig. 8 is a section taken in the transverse at line 3 in Fig. 6. Fig. 9 is a view of a modification of the elastic retaining-piece employed between the door-frame and the swing-stile of the door, and Fig. 10 is another modification of said elastic retaining-piece.

The same letters of reference refer to the same parts throughout the several views.

In the drawings, A is the door-frame plate, which plate may be made with any suitable form and of any suitable material and has provided in it the sockets a and a' , of any suitable form, and also the central opening a^2 at the lower end of said plate, as shown. Suitably connected with this plate A are the

back flanges A' A' , between which are arranged friction-rollers B B' , suitably supported on pintles b b' , supported from said flanges.

C is the door-stile plate, made of suitable metal and with a rectangular form, with its edges c c' on straight and parallel lines and having integral with its edge margins the hook-form tongues c^2 c^3 , which project laterally from the edges of the plate in a line on a plane of the outer surface of the same to a short distance or a distance corresponding with the thickness of plate A and are then turned outward and forward from point c^4 to a distance sufficient for entering into the sockets a and a' of plate A, as shown by full lines in Figs. 5 and 8, and serving as engaging hooks or holding devices for engagement with the said door-frame plate A from its rear or inner side after passage through the sockets a and a' , (as when the door D is turned open, as indicated by dotted lines in Fig. 8,) which tongues are shown to be in such engagement by dotted lines in Figs. 6 and 8.

E is an elastic coupling device suitably arranged between the door-frame F and door D. This elastic coupling device is adapted to hold with both the said frame and door through their respective plates A and C and their adjuncts. The adjuncts with plate A are the friction-rollers B and B' and post B^2 , while the adjunct with plate C is a suitable coupling-arm C' , with which the elastic coupling device E is engaged or secured. This coupling device E in my preferred form for use with heavy doors is shown in Figs. 6 and 7 to consist of a single suitable length of coiled tempered-steel wire e continuous throughout its whole length and having with one of its ends a suitable eye, as e' , for holding with post B^2 , secured in the door-frame F, and a similar eye, as e^2 , at its opposite end for holding with the coupling-arm C' , secured to the door D.

Fig. 9 illustrates a modification of construction of the elastic coupling device E, which may be employed in lieu of the construction of that device as shown in Fig. 7, which modification in Fig. 9 comprises two sections or members flexibly united, consisting of an elastic section or member E' of suitable length, made of tempered-steel wire (marked e in Fig.

9) similar to wire e in the device E in Figs. 6 and 7, and a flexible non-elastic section or member E^2 , suitably flexibly connected to the elastic portion E' , which latter is designed to be supported by rollers similar to rollers B B', Fig. 7, and have its free end coupled with the door through a coupling-arm similar to coupling-arm C', Figs. 7 and 8, while the free end of the non-elastic member E^2 would be secured to a post similar to post B² in Fig. 7 and for the same purpose. This modification is well adapted for use with doors of medium weight, and its flexible portion E^2 may be made of stout cord or sash-chain, as may be preferred.

Fig. 10 illustrates another modification of construction of the elastic coupling device E which may be employed. In this modification that device consists of a single piece of elastic rubber E^3 in the form of a strong strap or strip of suitable length and having one end thereof provided with eye e' for like purpose as eye e' in Fig. 7 for holding with coupling-post B² and has provided with its opposite end with eye e^2 for like purpose as eye e^2 , provided with the coupling device E in Figs. 7 and 8, for coupling with the coupling-arm C' as is eye e^2 of coupling device E is shown in Fig. 7 to be coupled with. This modification is adapted to be used with light doors, as summer screen-doors. Coupling-pieces of these modifications will be made to run from post B² over the friction-rollers B and B' and connect with coupling-arm C', substantially as the coupling device shown in Fig. 7. This elastic coupling device E, of whatever form of construction used, is preferably incased in the wood of the door-frame F by forming in the wood from its face side the recess F', of sufficient depth to receive the straight portion thereof, between post B² and roller B, and it is covered by a suitable closing-piece, as F², for excluding therefrom foreign substances.

The coupling-arm C' is preferably made of steel or stiff wire, with an open-form eye, as eye C², for convenience for readily engaging with it the eye e^2 of the elastic coupling device E, and it has a suitable portion of its body e^4 provided with screw-threads for screwing into a suitable holding substance or piece. I at present prefer to pass this screw-threaded portion e^4 through plate C and screw it into the wood of the swinging stile of the door or into a screw-threaded nut, as e^5 , set into the wood back of said plate C, as shown in Fig. 8. By having this arm C' secured in place by screw-threads, as shown in Fig. 8, said arm may be readily adjusted as to its length of projection from the face of plate C to its center of eye C² in either direction for lessening or increasing its leverage, as may be desirable for increasing or lessening the degree of pull on the door or as the size or width of the door may seem to require for best results.

In hinges for use with light-weight doors

only one pair of sockets $a a'$ need be employed in plate A, and a corresponding number of tongues $c^2 c^3$ be provided with plate C for co-action with said sockets, while for use with heavy doors two, three, or four or more of said sockets and engaging tongues may be employed at each side edge portion of said plates, if preferred, and any preferred thickness may be given to the metal of these plates A and C at their respective sockets and tongues, as the weight of the door may seem to require.

Two or any other suitable number of these double-acting spring-hinges may be employed for hanging doors from their door-frames.

When the door D is in closed position, as shown in Figs. 5 and 8, the plate C, secured to the swing-stile of the door, will be in situation flat against plate A, secured to the door-frame, and the tongues $c^2 c^3$ will have holding with the respective sockets $a a'$ they respectively enter and be efficient for supporting the door, while the coupling devices E and arms C' will coact to draw the edge of the stile of the door close to the frame of the same and prevent the door from sagging. When the door is turned to the right or to the left, as indicated by dotted lines in Fig. 8 may be done, the tongues c^2 or c^3 , according to the direction the door is opened, will engage with the metal portions of plate A adjoining the sockets said tongues enter and hold with the frame and keep the door vertical and from sagging. The swinging of doors open when hung by my improved hinges will be found to be unattended by any great friction and will quickly start to close when released from a back holding and have its closing completed in a slowed manner and without being attended with any great noise. These advantageous results are due to the gradual weakening of the resilient force of the elastic coupling device E, which together with the resistance of the air which meets the door when moving toward its closed position. It is evident that plate A, with its adjuncts, may be secured to the door and that plate C and arm C' may be secured to the frame, and similar advantageous operations and results may thereby be obtained.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a double-acting spring-hinge for doors the combination with plate A, provided with sockets $a a'$ and central opening a^2 and flanges A' A', rollers B B' supported on pintles from said flanges, and plate C having integral with it hook-form tongues $c^2 c^3$ registering with sockets a and a' in said plate A, of the elastic coupling device E, described, adapted to be supported on said rollers and have one end thereof connected with the door-frame and the opposite end with a door, substantially as and for the purposes set forth.

2. In a double-acting spring-hinge for doors, the combination with plate A, provided with

sockets a a' , central opening a^2 , flanges A' A'
and rollers B B' supported from said flanges,
of plate C , hook-form tongues c^2 c^3 integral
with plate C and registering with said sock-
5 ets of plate A , elastic coupling device E sup-
ported from the said rollers, coupling-arm C'
and coupling-post B^2 respectively for opera-

tion between the opposite ends of said coup-
ling device and the door and door-frame, sub-
stantially as and for the purposes set forth. 10

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