

No. 762,362.

PATENTED JUNE 14, 1904.

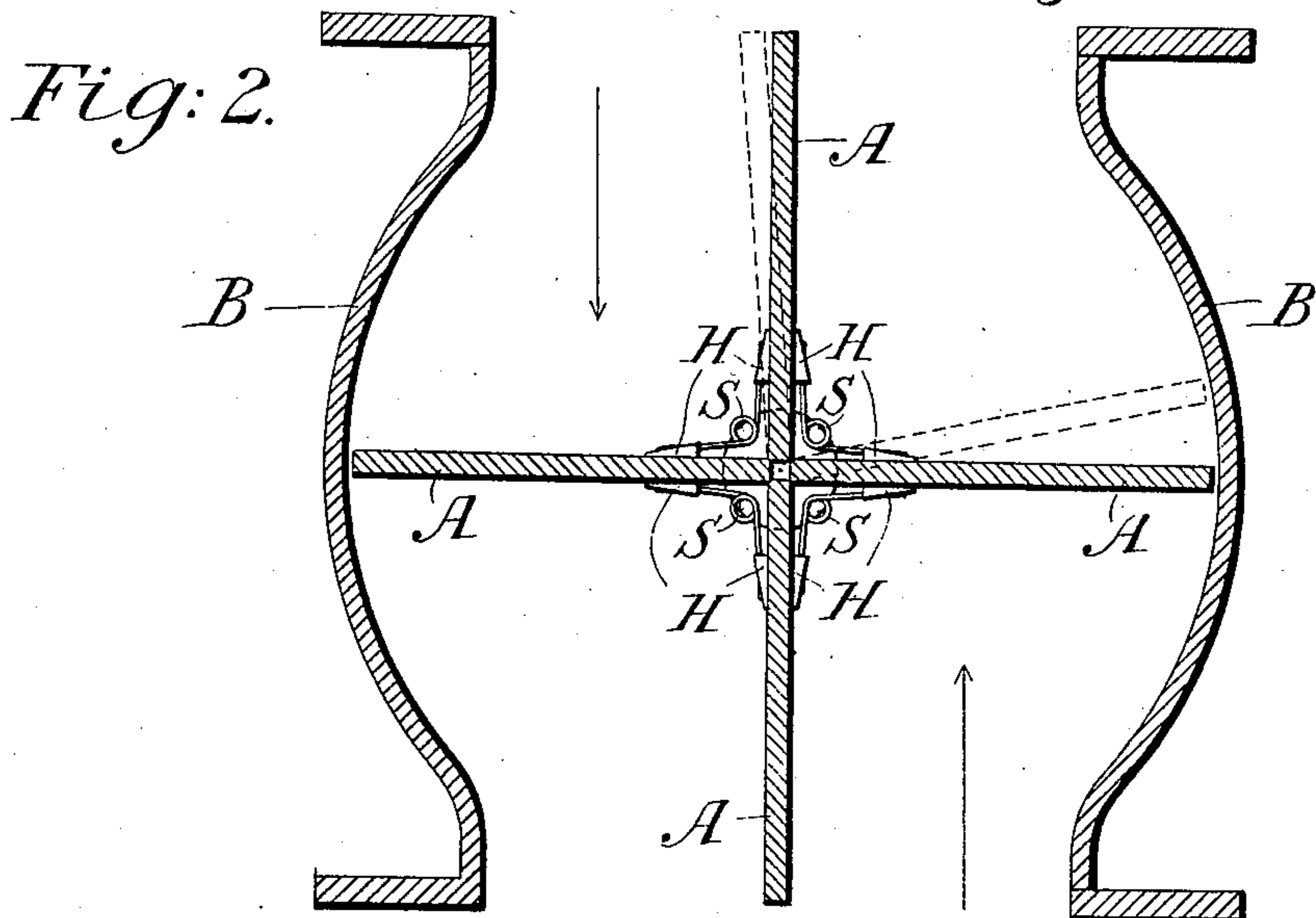
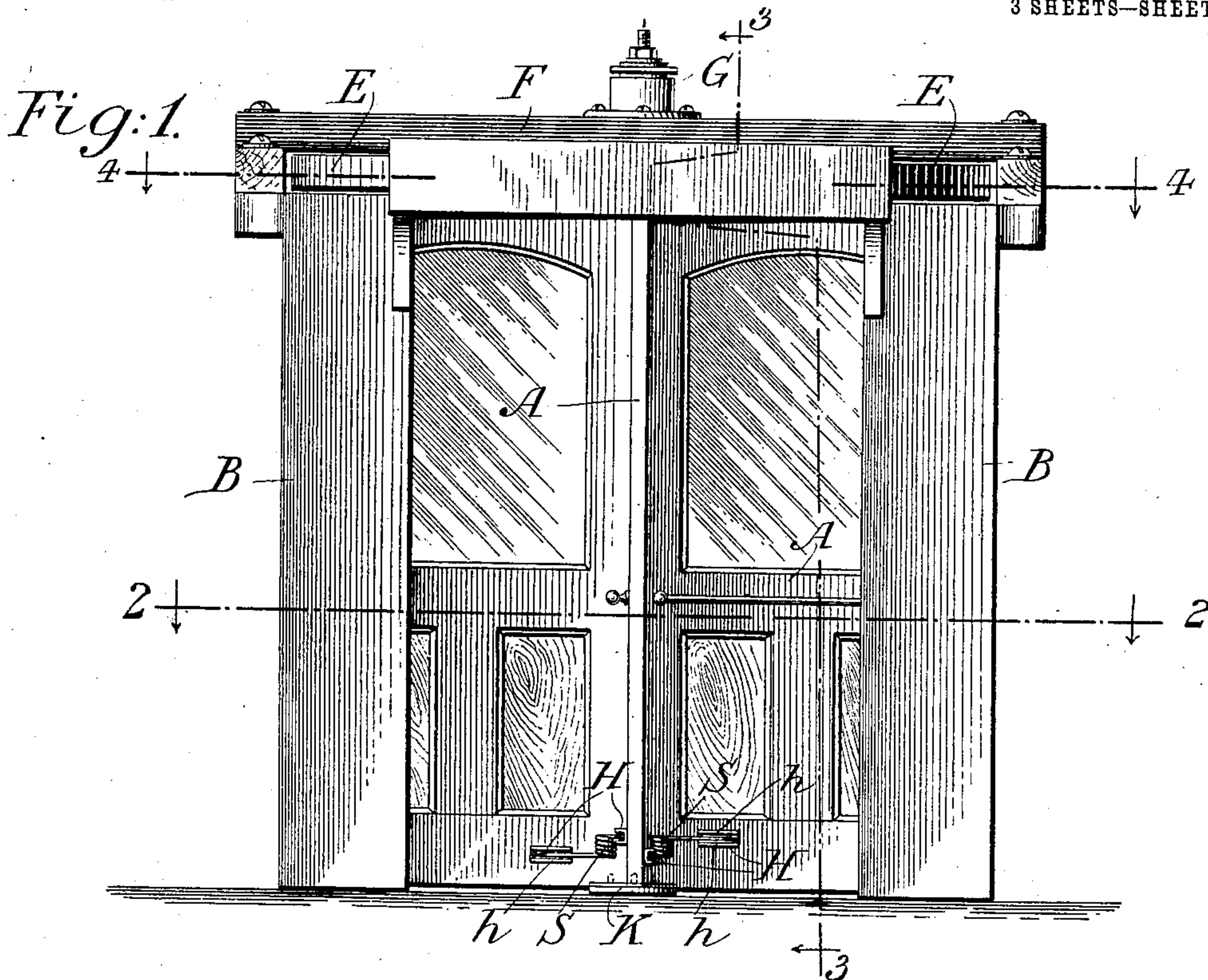
J. W. SUTTON & J. A. RENNIE.

REVOLVING DOOR.

APPLICATION FILED AUG. 6, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:

Peter Mc Nicol
Thomas Duffy

INVENTORS

John W. Sutton
and
John A. Rennie

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Fig. 3.

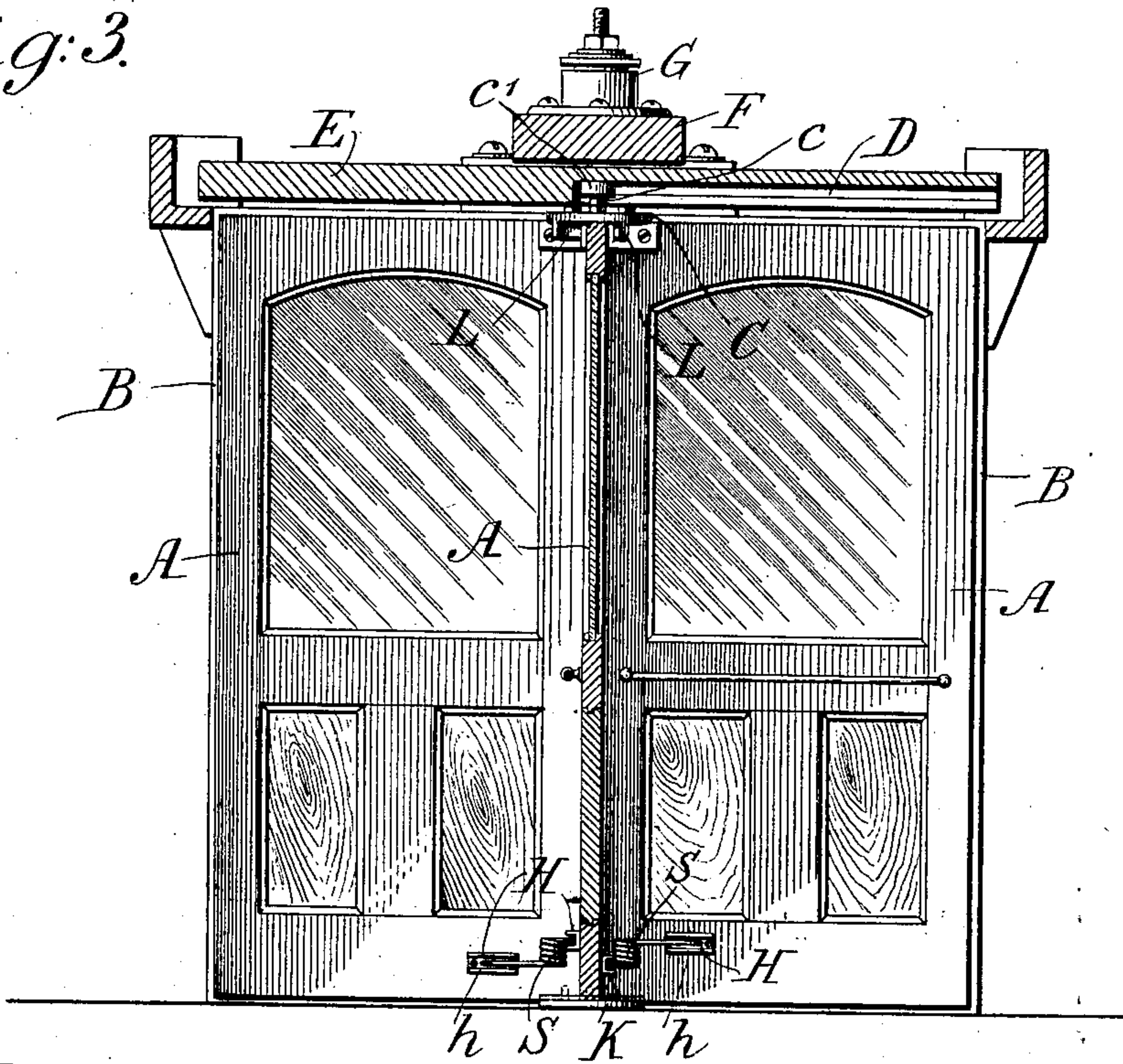
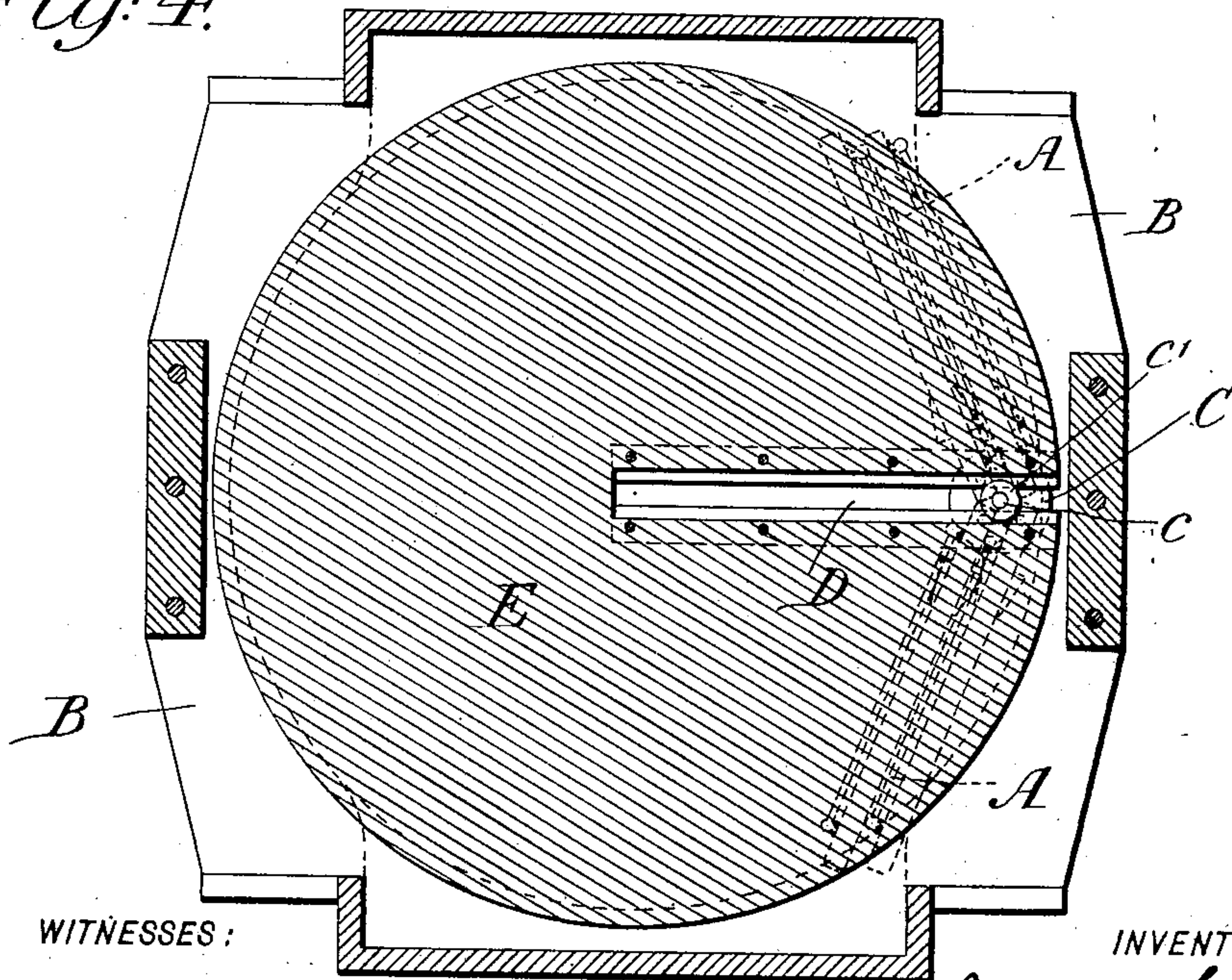


Fig. 4.



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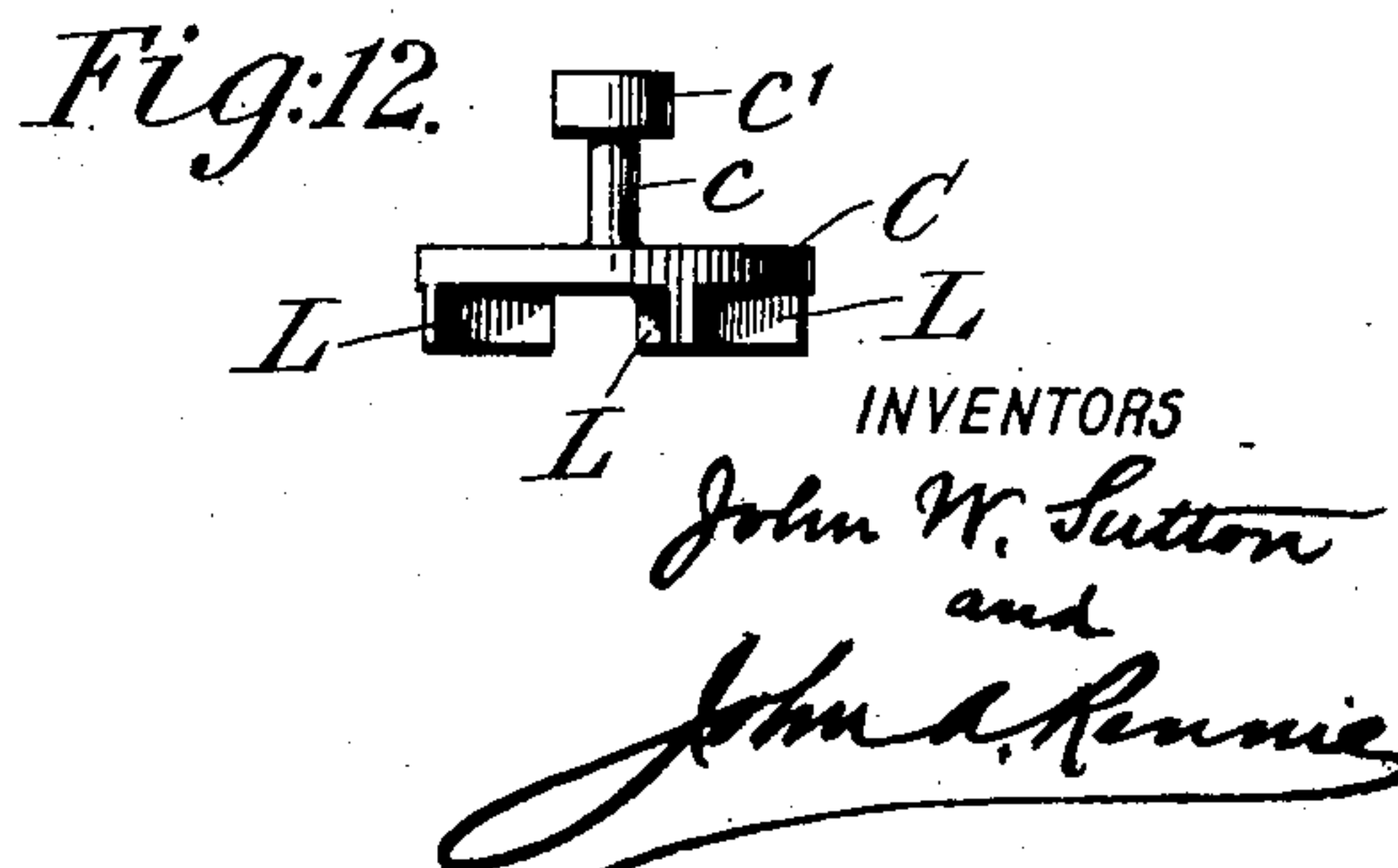
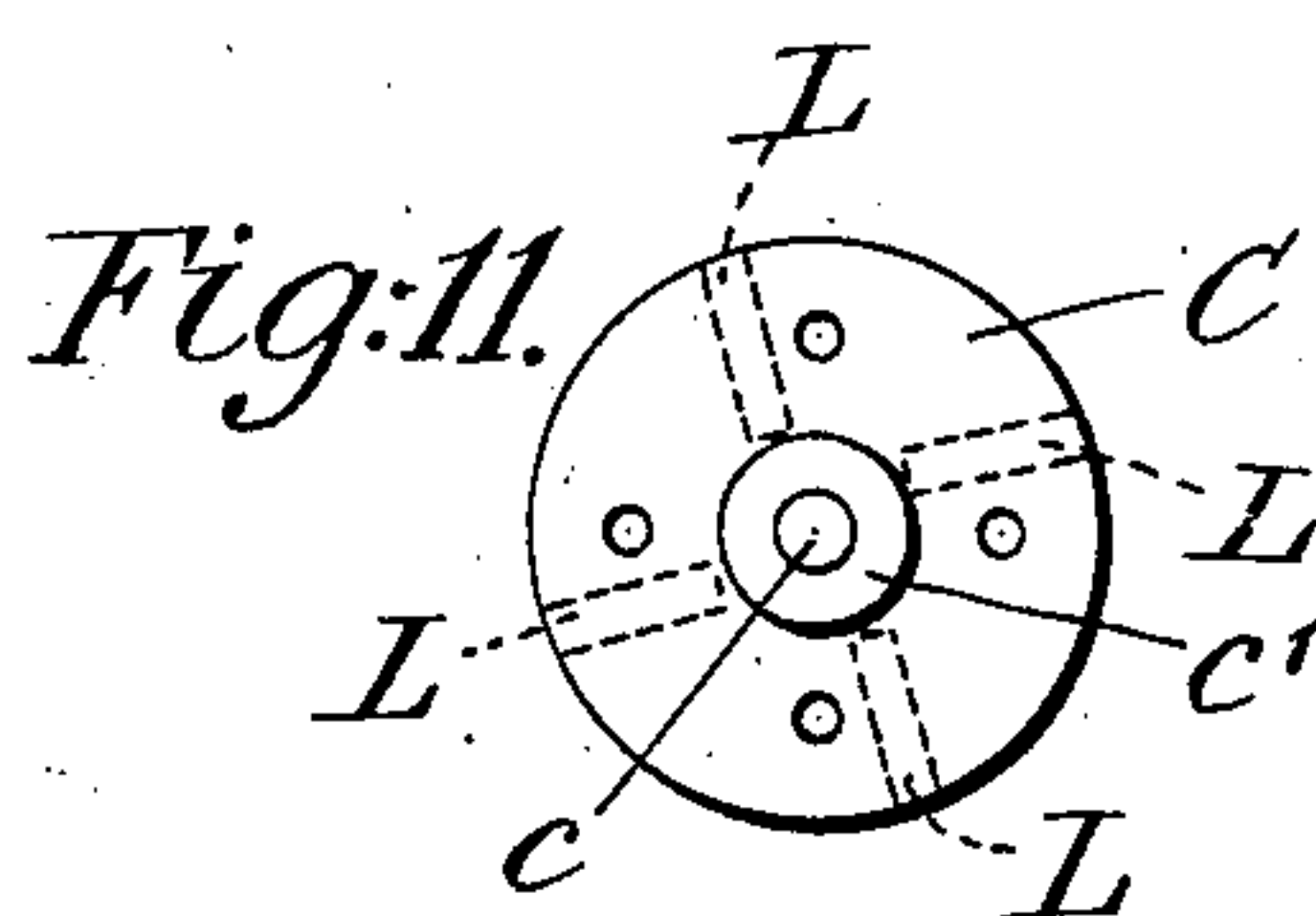
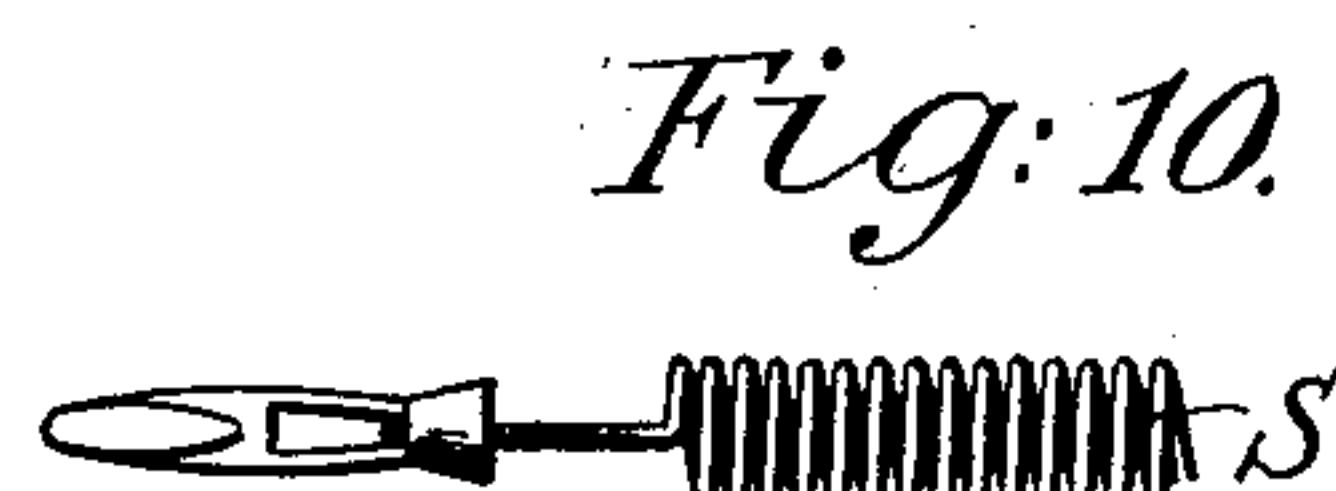
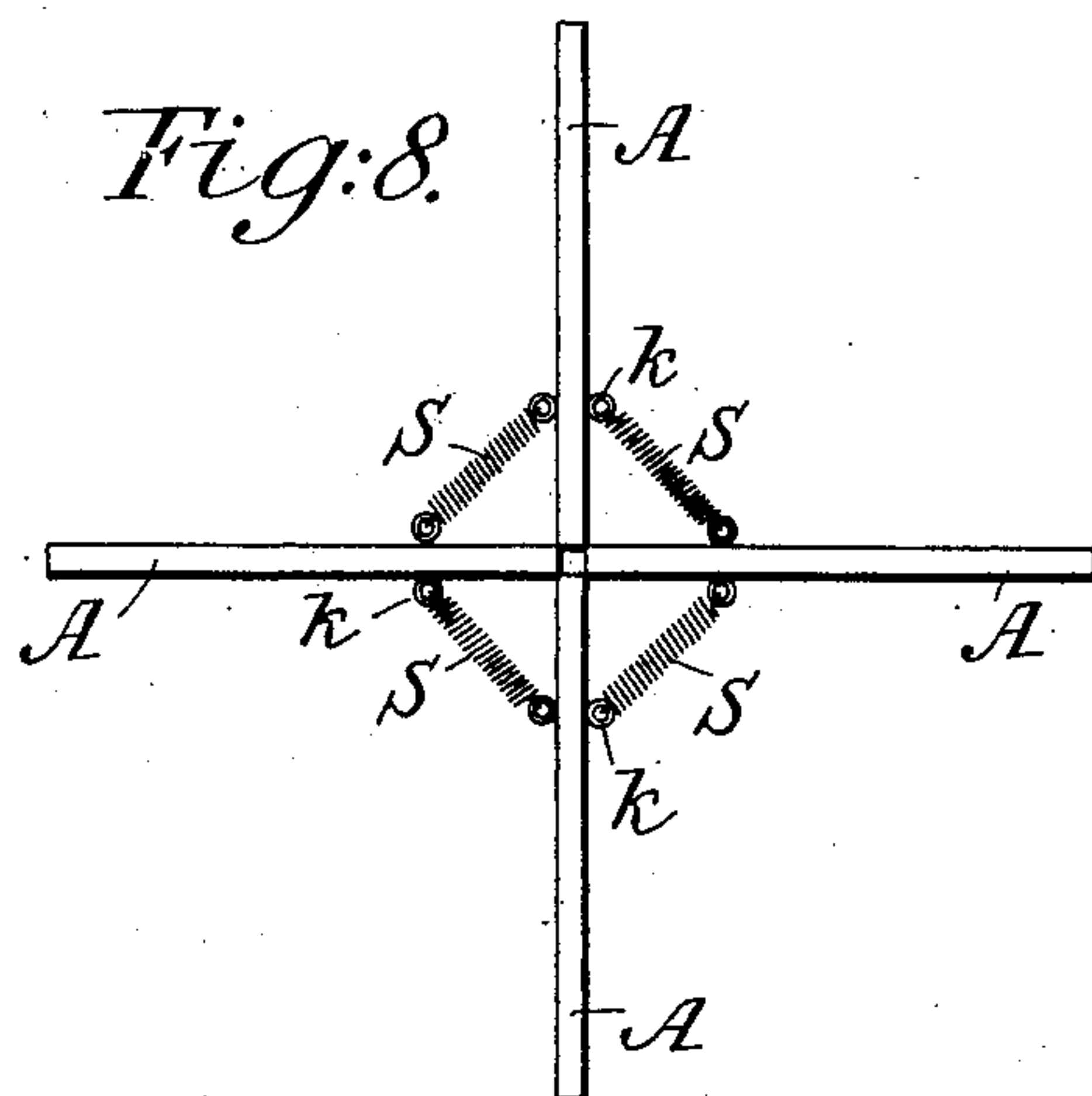
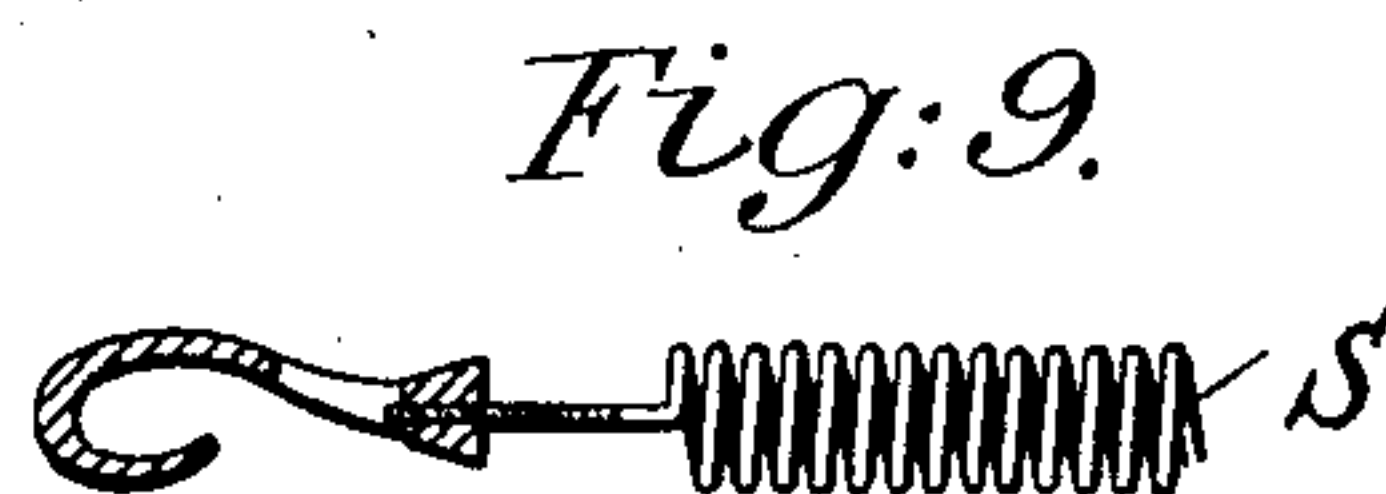
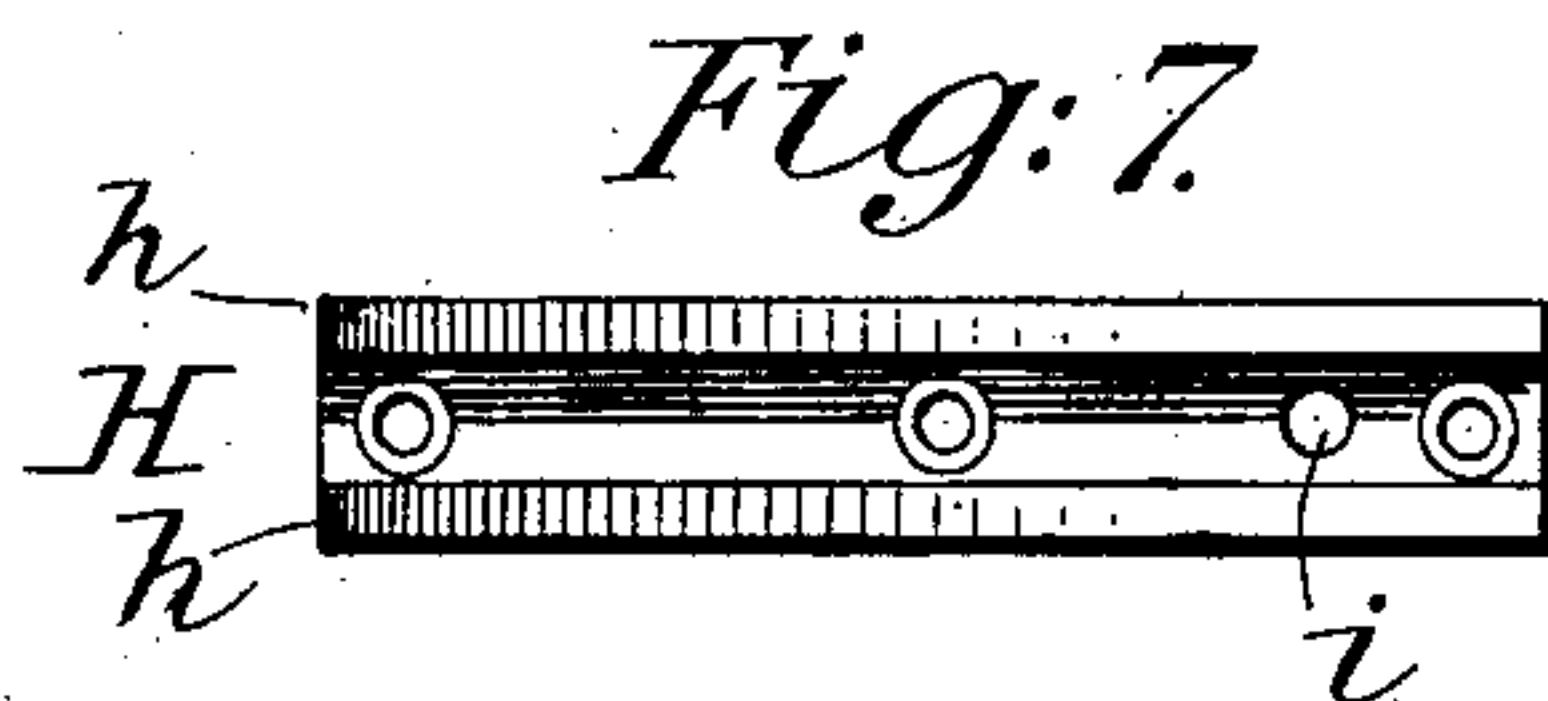
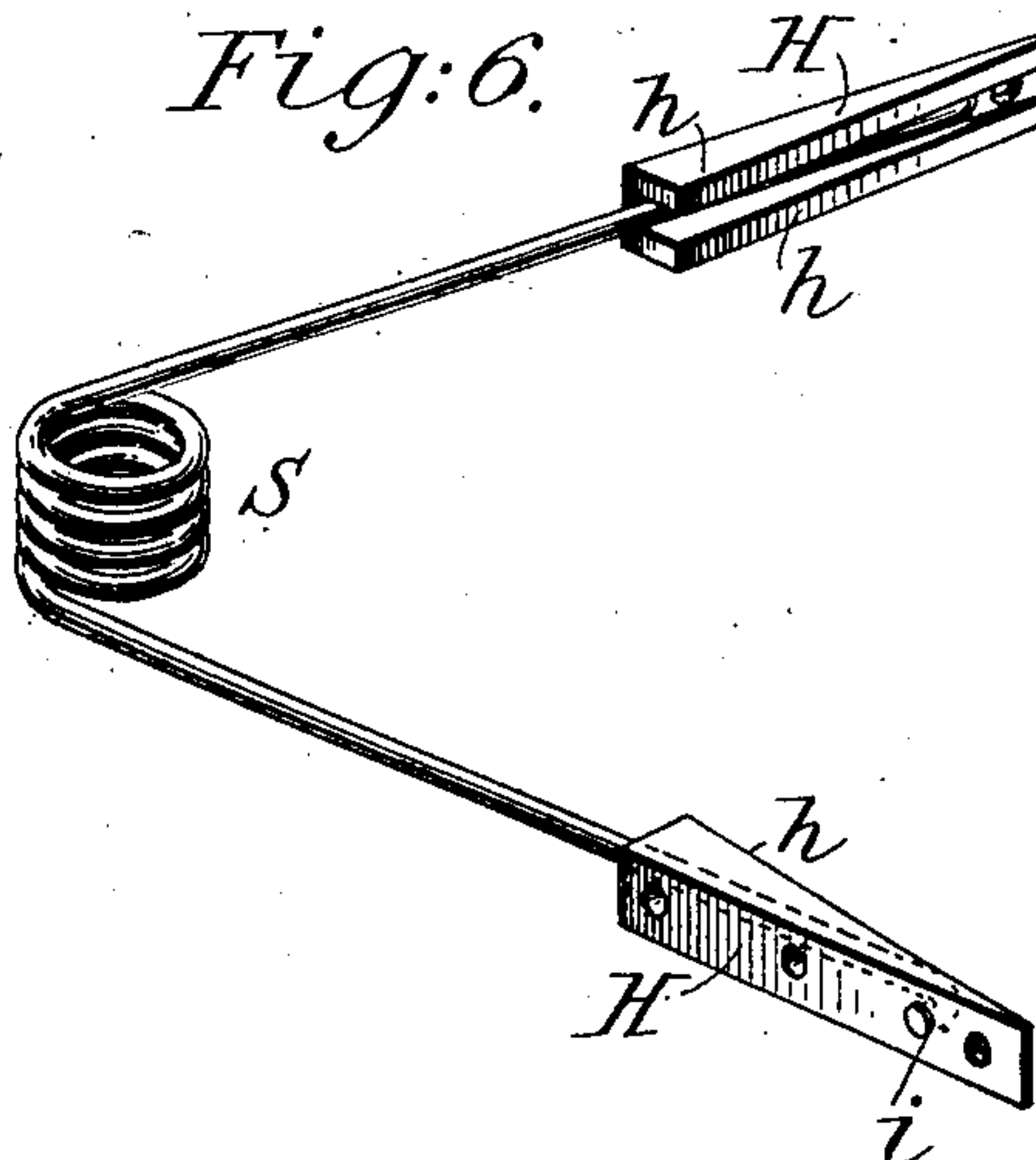
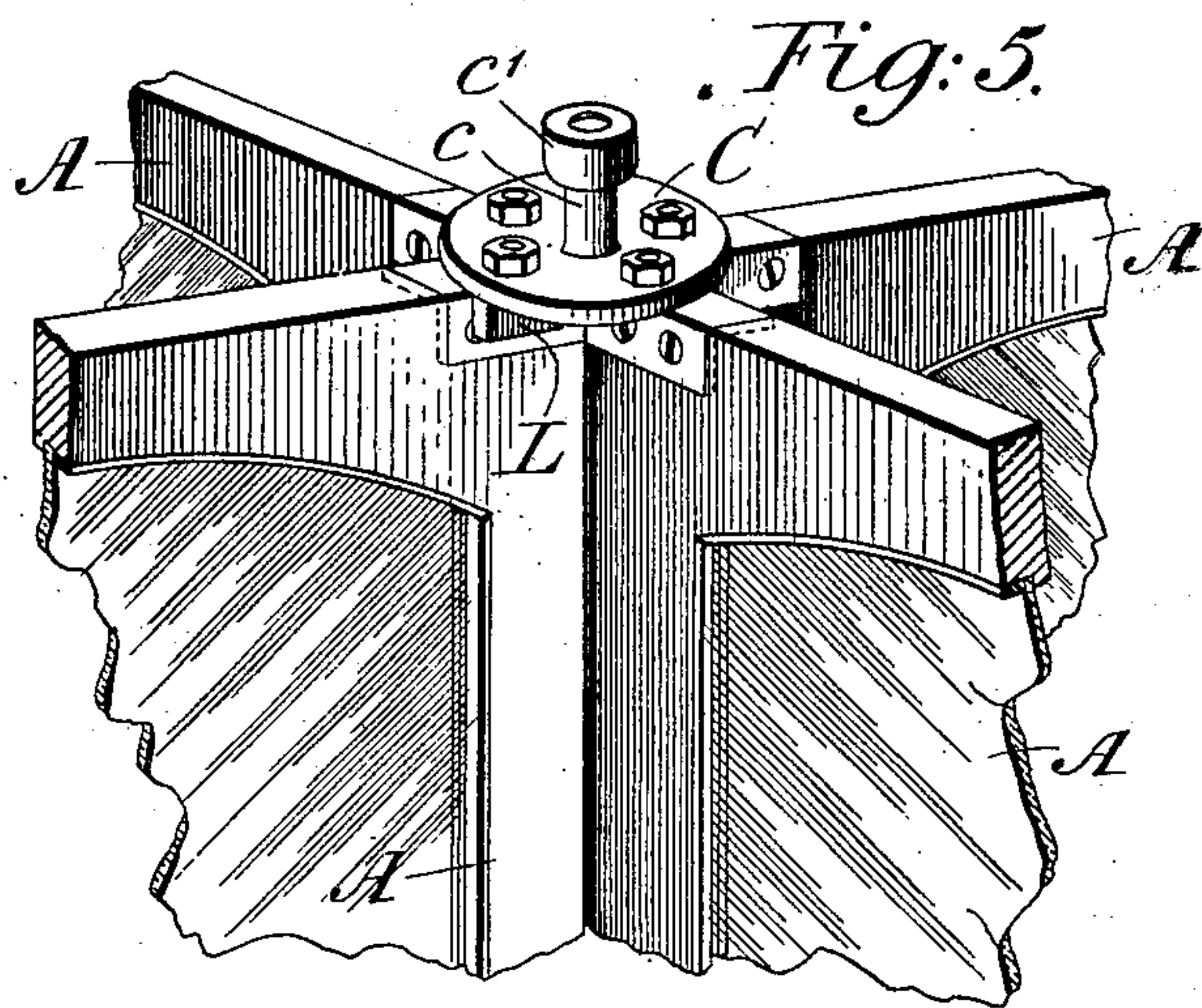
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UNITED STATES PATENT OFFICE.

JOHN W. SUTTON, OF BROOKLYN, AND JOHN A. RENNIE, OF
NEW YORK, N. Y.

REVOLVING DOOR.

SPECIFICATION forming part of Letters Patent No. 762,362, dated June 14, 1904.

Application filed August 6, 1902. Serial No. 118,641. (No model.)

To all whom it may concern:

Be it known that we, JOHN W. SUTTON, a citizen of the United States, residing in the borough of Brooklyn, county of Kings, and
5 JOHN A. RENNIE, a subject of the King of Great Britain, residing in the borough of Manhattan, county of New York, city and State of New York, have jointly invented a certain new and useful Improvement in Re-
10 volving Doors, of which the following is a specification.

This invention relates to revolving doors having multiple wings or sections, and has for its object, primarily, to render the move-
15 ment of the door either in ingress or egress more easy to the person passing, or, in other words, to produce such a construction that the minimum amount of power applied ini-
20 tially in moving any one of the wings of the door will be accumulated mechanically and the revolution (and consequent opening of the passage-way) be accomplished by the least manual effort on the part of the person pass-
ing through.

25 To this end our invention has for its chief feature a system of springs, in connection with the several members or sections of the revolving door, which render to each other mutual aid in moving the multiple-winged
30 door in either direction.

The main object of the invention is to overcome the inertia or weight of the ordinary revolving doors, and with this in view we provide spring-connections between the doors, so that
35 the user will encounter a cushioned surface instead of the heavy resistance usual under present conditions. For example, if one door is pushed upon the spring immediately in front will be slightly compressed until the
40 limit of compression is reached, when the door ahead will begin to move, and in a similar manner will the door behind move when the limit of expansion of spring in rear is reached. Thus in operating the door you have no more weight
45 to overcome with the springs than you have without them, as the force is not diminished, but is gradually accumulated. If, however, only one of the doors was free to move while

the other doors were held against movement, then we would have the resistance of the
50 springs to overcome; but where all the doors are swung from a common center and are adapted to move together then we gradually overcome the resistance without adding any weight to the structure.

Certain novel features of construction and arrangement of parts are also embodied in our invention, all of which tend to its practical and useful operation upon the lines just
60 premised, and these will now be described.

For full comprehension, however, of our invention reference must be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate like parts in the several figures.

65 In said drawings, Figure 1 is a front elevation of our newly-invented revolving door. Fig. 2 is a sectional plan of the same, taken on the line 2 2. Fig. 3 is a vertical sectional elevation on line 3 3, Fig. 1, showing the in-
70 strumentalities whereby the several wings or divisions of the door are carried from the top and are permitted to move easily in the required direction. Fig. 4 is a sectional plan on line 4 4, Fig. 1, indicating the means where-
75 by the door-sections are permitted to travel in their proper channels and also showing said door-sections folded together and stowed aside when the maximum opening is desired for
80 passage of bulky objects, a thoroughfare for numerous persons, or for ventilation and convenience in hot weather. Fig. 5 is a detail view in perspective illustrating the means we
85 prefer to employ for hanging our revolving door and affording connection for the operating-springs. Fig. 6 is a detail, shown in enlarged perspective, of one of the springs and the socket employed for its connection with the door-section. Fig. 7 is a detail plan, en-
90 larged, of the spring-socket, illustrating particularly the means for retaining the end of the spring. Fig. 8 is a diagrammatic view of a modified arrangement of springs in connection with the door-sections; and Figs. 9 and
95 10 are details of construction, showing means for adjusting tension of springs used in the

modified form indicated in Fig. 8. Figs. 11 and 12 are details of pivotal connecting-plate, to be referred to.

We will now describe our invention in connection with said drawings, premising that they show practical means for putting the same into successful operation, and will then point out the novel features in the claims, it being understood that we do not limit ourselves in setting forth such details, as they may be amplified or changed in their mechanical construction and combination without departing from the principle or sacrificing the advantages of our invention.

Referring now more particularly to Figs. 1, 2, and 3, A A represent four door-sections made up of wood panels or partly of glass or of ratan or other materials and in such form and construction as may be desired, such door-sections being preferably arranged rectangularly when in their normal position. B represents the casing within which the four-sectioned door revolves, the same being of any ordinary or preferred construction and configuration. In the drawings we show such casing of cylindrical or arc form.

The revolving door is supported from the top, a metal plate C affording pivotal connections for the four sections at the point where their inner edges approach each other at the top, as seen clearly in Figs. 3 and 5, and this plate has an upwardly-projecting spindle *c*, having an enlarged head or carrying a roller *c'*, which fits within and is adapted to travel in a guide D, fastened to or formed within a ceiling-plate E, which is preferably of slightly-larger area than the opening within which the door revolves. This guide D extends approximately from the center to the circumference of the ceiling-plate E, as shown in Figs. 3 and 4, and the plate E is supported centrally by one or more braces F, forming a fixed portion of the casing, a suitable thimble or housing G for ball-bearings being arranged centrally between the plate E and the bracing-piece F as a means of connection and to insure the easy rotation of the door in either direction. The construction of this ball-bearing support forms no material feature of our invention and may be of any preferred form.

Each of the door-sections A A has affixed to it (preferably near the bottom, as seen in Fig. 1) two shoes H, one on each side, such shoes being preferably of cast metal and tapered toward one end, as shown in Fig. 6, there being two wings or side walls *h* *h*, between which lies one end of a centrally-coiled spring S, the extreme point of which is bent and projects into and is retained within a hole or socket *i*, formed in the base portion of the shoe. There is a spring for each pair of shoes, and said springs are similarly formed at both ends, the shoes also being all

identical in construction and evenly spaced upon the sides of the respective door-sections, so that one end of each spring is held in a shoe on opposite door-sections, as seen clearly in Fig. 2. These door-sections are independent of each other, so far as construction is concerned, although they are pivoted at the top, as before mentioned, to the plate C, and also by preference again pivoted to another plate K at the bottom, the springs S, however, being arranged, as described, with their opposite ends bearing against different door-sections, (in the several shoes H,) rendering their movement interdependent, that being the salient feature and purpose of our invention, as will now be more fully explained. When a person desires to pass through the doorway and pushes upon one door-section, the several springs are brought into play in such manner that additional impetus is given to the door in its revolution, and the force is automatically gradually accumulated by the compression of the spring immediately behind the section pushed upon, and the following spring is also compressed, and so on, all around the circle. The several springs act to impart motion to the entire revolving structure, thereby aiding the initial force applied by the hand of the person passing through the doorway. In this manner the minimum manual exertion only is required, whereas in the old styles of revolving doors frequently more strength is required in effecting an entrance than is possessed by many weak persons or by those carrying parcels or burdens and not having the force of both hands at their disposal.

In order that the springs S may be relieved of the strain of the whole revolving structure after the initial movement has been given to any one of the door-sections, we prefer to provide, preferably on the under side of the plate C, a series of stops L, one for each door-section, and against which they will abut after they have been moved the desired distance. The adjustment of these stops with relation to the door-sections will be determined and controlled entirely by the resistance or strength of the springs, as will be readily understood.

The dotted lines in Fig. 2 indicate approximately the relative movement of the first and second door-sections, the first being the one pushed upon by the person passing through, and the arrows indicate direction of ingress and egress.

In the modification, Fig. 8, we show plain coiled springs S, with their ends fastened directly to the sides of the door-sections, (without the intervention of the shoes H,) and turn-buckle-hooks are illustrated in Figs. 9 and 10, whereby the ends of the springs are connected to the eyes *k* upon the door-sections and by which the tension of the springs may be varied and adjusted at will.

The removal of the doors from their nor-

mal position and their bestowal at the side of the opening or casing is easily accomplished by unshipping the several springs (either wholly or by disconnecting one end of each only) and folding the door-sections together in pairs and then sliding the whole to one side of the passage-way or door-casing, the spindle head or roller *c'* moving easily within the guide D, formed upon or attached to the ceiling-plate E, as before described, this transformation of position being shown clearly in Fig. 4. This change will leave the opening clear of obstruction and is often desirable to afford extra ventilation in hot weather or for the passage of bulky goods or to afford ingress or egress of large numbers of persons at one time.

Although we have shown four sections or wings in our revolving door, it must be understood that these may be increased or lessened according to circumstances or demand, and the casing, housings, and supports may be of any suitable construction and detail without material change in the essential principle of our invention.

What we claim, and desire to secure by Letters Patent, is as follows:

1. A revolving door, consisting of a series of wings or sections hingedly secured with relation to each other, and connections secured upon each side of each wing and in between each face of all wings, whereby when one door is pushed upon the means in front will be compressed so as to cause the wing to which it is connected to move while the means to the rear of the wing which is pushed upon will be extended so as to cause the wing to which it is connected to be pulled upon.

2. A revolving door, made up of a plurality of wings or sections, means for pivotally mounting the wings or sections secured at their top and bottom, and a series of spring connections between each pair of wings so mounted that when one member is pushed upon the member in front will be moved slightly as its spring is compressed and the member in the rear will be moved slightly in the same direction by the extension of its spring.

3. In a revolving door the combination with a series of wings or sections secured together so as to revolve in unison, springs interposed between and connected to each pair of said wings, whereby the compression or expansion of such springs will assist in the movement of the two doors to which they are connected and thereby the whole structure, a ceiling-plate connected to and revolving with the upper portion of the wings and a journal for said ceiling-plate.

4. A revolving door consisting of an upper and lower plate, a plurality of wings or sections independently and swingingly mounted between said plates, spring connections be-

tween the sections or wings, so mounted that when one wing is pushed upon the wing in front will be moved slightly as its spring connection is compressed and the wing in the rear will be pulled slightly in the same direction by the extension of the spring connection in the rear, and stops to limit the extent of movement of the sections.

5. The combinations with fixed walls and a revolving ceiling-plate provided with a groove extending from the circumference to the center thereof, of a revolving door having its upper end removably fitting within the groove of the ceiling-plate consisting of a series of wings or sections, a plate to which the upper inner edges of each of said sections are pivotally hinged provided with an upwardly-projecting spindle, which engages the groove of the ceiling-plate, and detachable spring connections between the wings or sections of the door.

6. A revolving door consisting of a series of independently-pivoted wings or sections, shoes fixed upon opposite sides of each of said wings, and springs having their extended ends secured within said shoes.

7. In combination with a casing having opposite entrances, of a closure therefor, consisting of a rotatable ceiling-plate, a revolving door consisting of a series of pivoted sections or wings journaled in the ceiling-plate and upon the floor of the casing respectively, and a series of spring connections between the sections or wings and so secured upon each side of said wings and between them that when one wing is pushed upon the spring in front will be compressed so as to cause the wing to which it is connected to move while the spring to the rear of the wing which is pushed upon will be extended so as to cause the wing to which it is connected to be pulled upon.

8. In combination with a casing having opposed entrances, a ceiling and a floor, of a closure therefor consisting of a rotatably-mounted ceiling-plate provided with a groove extending from the center thereof to the periphery thereof, a plate having an upwardly-projecting headed spindle slidably mounted within said groove of the ceiling-plate, a bearing-plate mounted upon the floor of the casing in line with the center of the ceiling-plate, and a revoluble sectional closure connected to said plates.

9. In combination with a casing having opposed entrances, a ceiling, and a floor, of a closure therefor consisting of a rotatably-mounted ceiling-plate provided with a groove extending from the center thereof to the periphery thereof, a plate having an upwardly-projecting headed spindle slidably mounted within said groove of the ceiling-plate, a bearing-plate mounted upon the floor of the casing in line with the center of the ceiling-plate,

and a revoluble closure for the casing consisting of a series of wings or sections independently and pivotally mounted between said plates, and spring connections between said
5 sections.

10. In combination with a casing having opposed entrances, a ceiling, and a floor, of a closure therefor, consisting of a rotatably-mounted ceiling-plate provided with a groove extending from the center thereof to the periphery thereof, a plate having an upwardly-projecting headed spindle slidably mounted within said groove of the ceiling-plate, a bearing-plate mounted upon the floor of the casing
15 in line with the center of the ceiling-plate, a revoluble closure for the casing consisting of a series of wings or sections independently and pivotally mounted between said plates, and springs each one having its ends connected
20 between the doors.

11. In combination with a casing having opposed entrances, a ceiling and a floor, of a closure therefor, consisting of a rotatably-mount-

ed ceiling-plate provided with a groove extending from the center thereof to the periphery thereof, a plate having an upwardly-projecting headed spindle slidably mounted within said groove of the ceiling-plate, a bearing-plate mounted upon the floor of the casing in line with the center of the ceiling-plate, and
25 a revoluble closure for the casing consisting of a series of wings or sections independently and pivotally mounted between said plates, shoes connected upon opposite faces of each door, and a series of springs each provided
30 with a central coil and oppositely-extending hooked terminals mounted in the respective shoes.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses. 40

JOHN W. SUTTON.
JOHN A. RENNIE.

Witnesses:

E. E. WINTRINGHAM,
HARRY MILLER.