

No. 804,633.

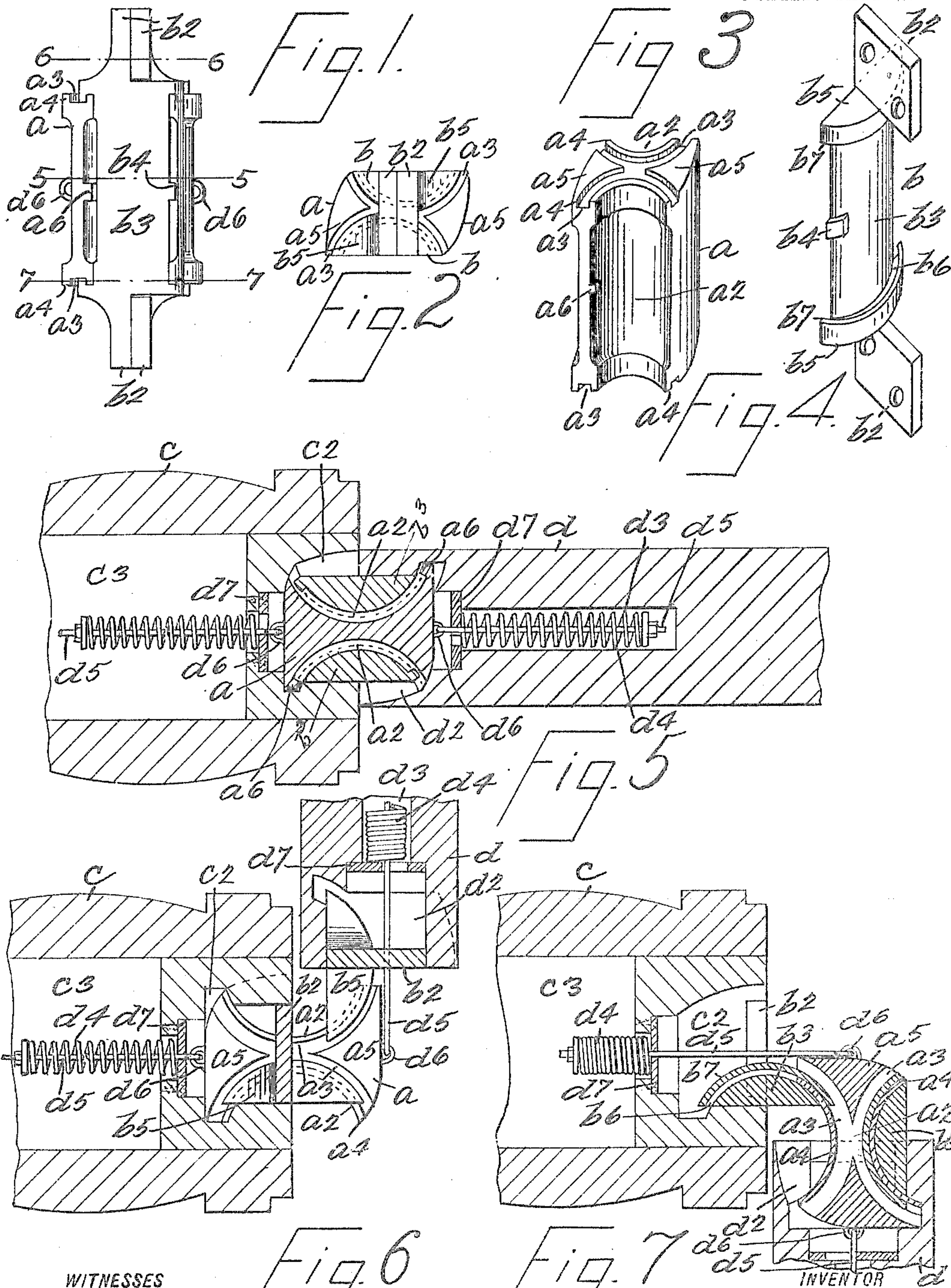
PATENTED NOV. 14, 1905.

J. SOSS.

HINGE.

APPLICATION FILED NOV. 7, 1904.

3 SHEETS—SHEET 1.



WITNESSES

J. B. Larsen
J. A. Stewart

BY

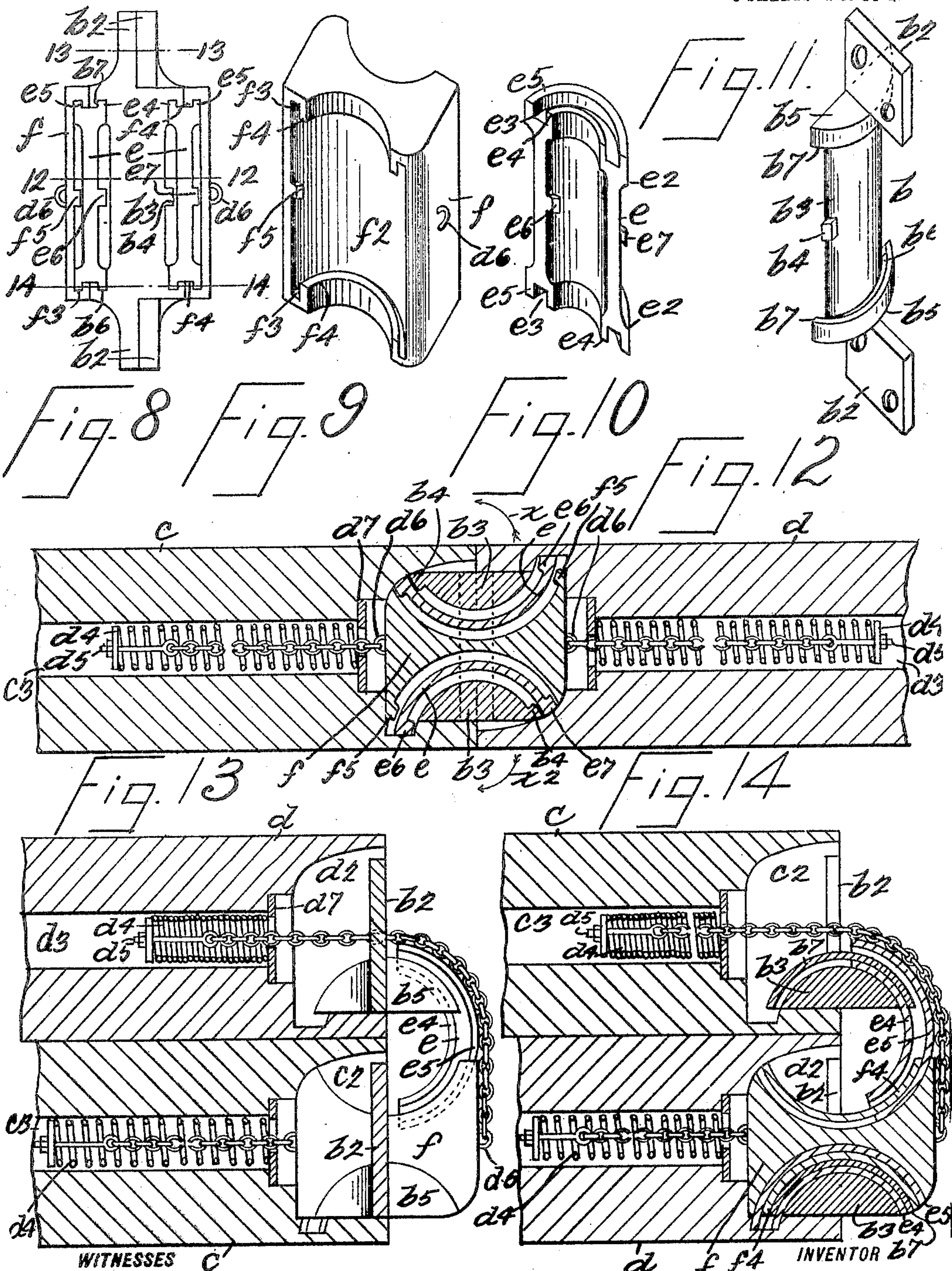
Joseph Soss
Edgar Tate & Co.

ATTORNEYS.

J. SOSS.
HINGE.

APPLICATION FILED NOV. 7, 1904.

3 SHEETS—SHEET 2.



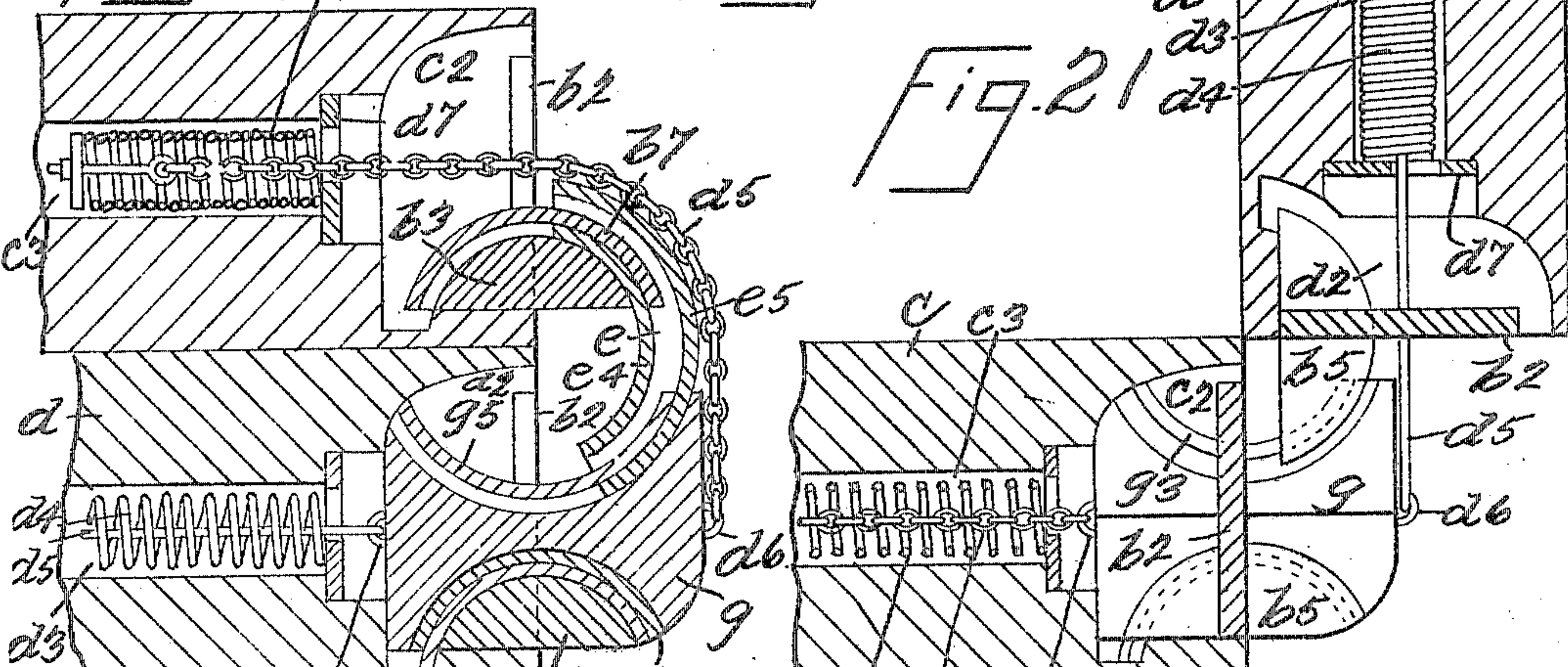
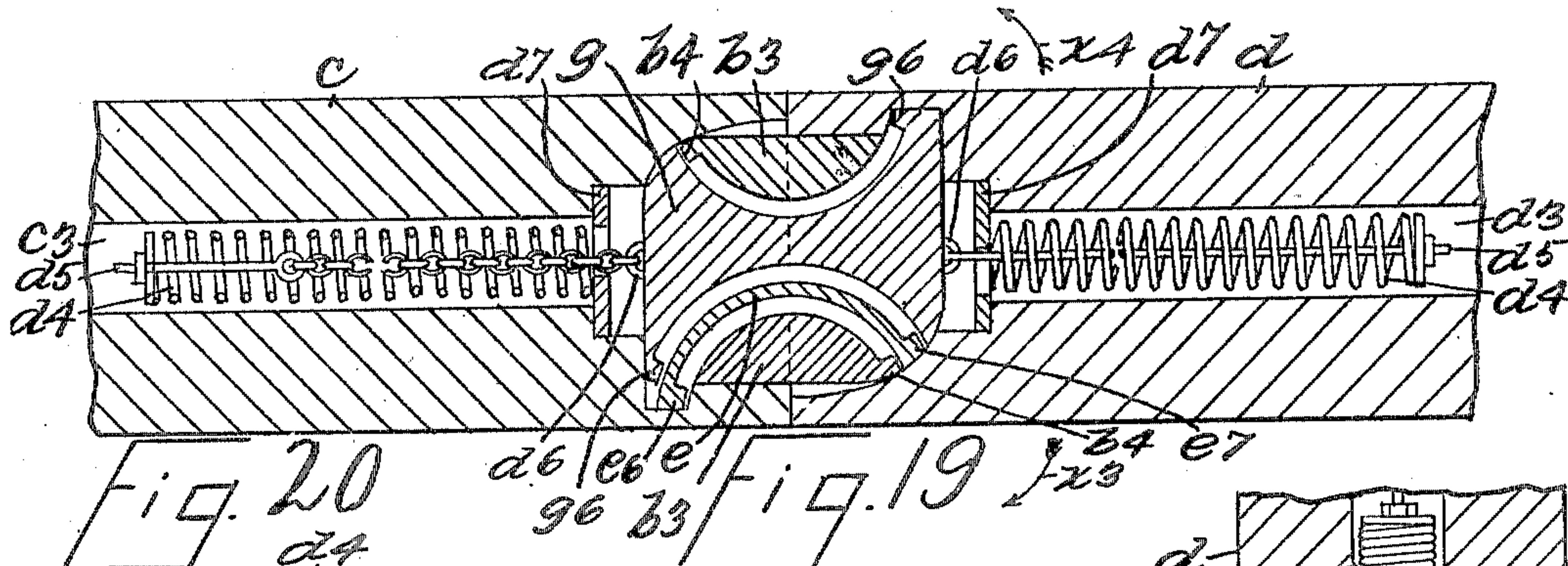
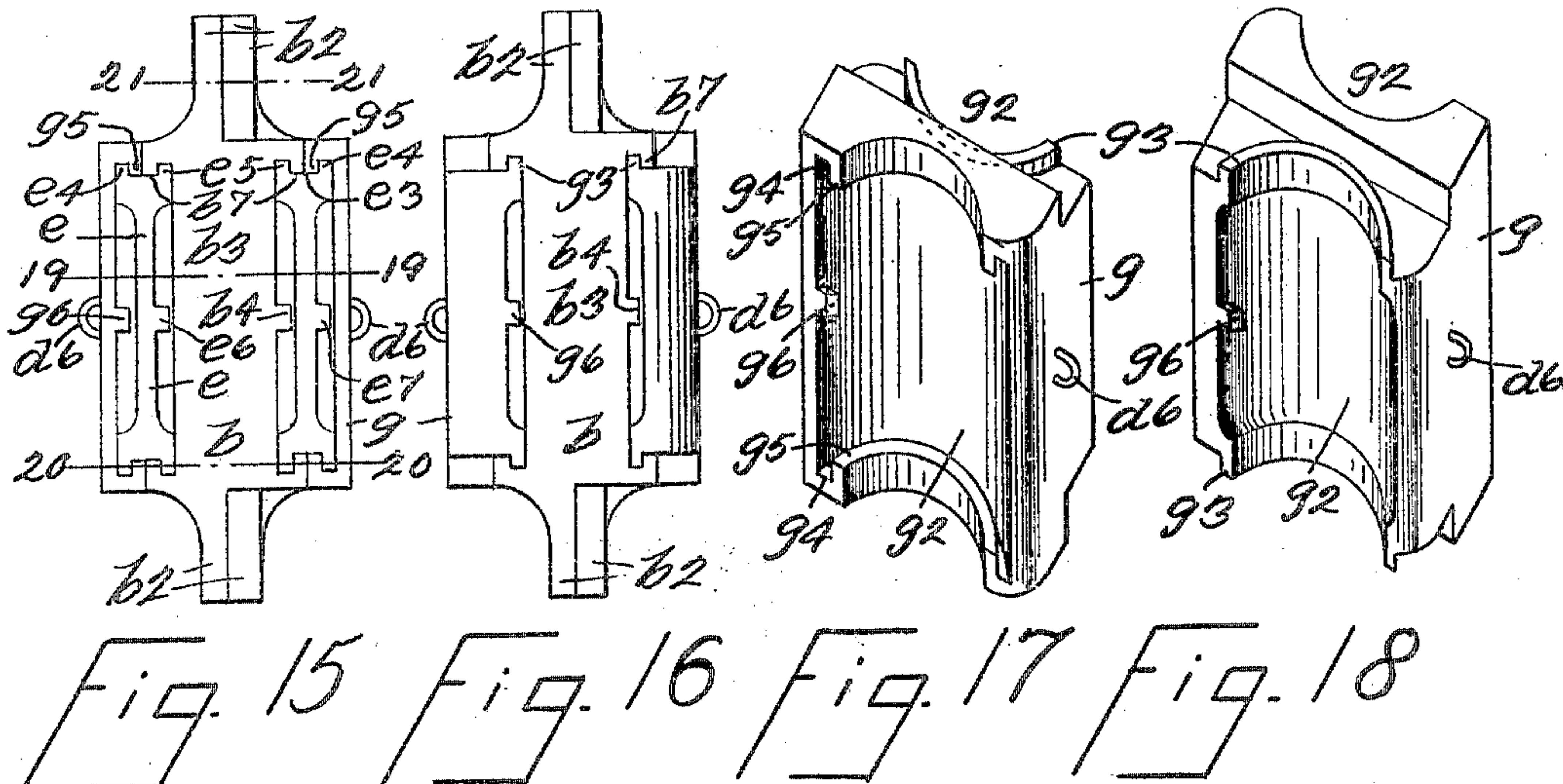
WITNESSES
J. B. Larkin
F. A. Stewart

BY
Joseph Soss
Edgar Tate & Co.
ATTORNEYS.

J. SOSS.
HINGE.

APPLICATION FILED NOV. 7, 1904.

3 SHEETS—SHEET 3.



WITNESSES
J. C. Lander
T. A. Stewart

INVENTOR
Joseph Soss

BY
Edgar Tate & Co.
ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOSEPH SOSS, OF NEW YORK, N. Y.

HINGE.

No. 804,633.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed November 7, 1904. Serial No. 231,650.

To all whom it may concern:

Be it known that I, JOSEPH SOSS, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Hinges, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

10 This invention relates to hinges which are particularly designed for use in connection with doors; and the object thereof is to provide improved hinges of this class which are concealed when the door is closed and by
15 means of which a door may be swung through an arc of one hundred and eighty degrees, three hundred and sixty degrees, or two hundred and seventy degrees, according to the construction of the hinges and the number of
20 parts employed.

In the drawings forming part of this specification I have shown three forms of my improved hinge, the first form being shown in Figures 1 to 7, inclusive, and by means of
25 this construction a door may be swung through an arc of one hundred and eighty degrees. The second form of construction is shown in Figs. 8 to 14, inclusive, and a door provided with hinges constructed as shown in these figures may be swung through an arc of three
30 hundred and sixty degrees. The third form of construction is shown in Figs. 15 to 21, inclusive, and by means of the construction shown in these figures a door may be swung
35 through an arc of two hundred and seventy degrees. I have also shown my improved hinges for doors constructed so as to operate as spring-hinges, whereby the door when
40 swung into any position will be automatically closed; but, as will hereinafter appear, the springs are not an absolute feature of my improved hinges.

The invention is fully disclosed in the following specification, of which the accompanying
45 drawings form a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which—

Fig. 1 is a side view of the first form of my
50 improved hinge detached from a door; Fig. 2, a plan view thereof; Fig. 3, a perspective view of the central part of the hinge which in this form of construction is composed of three parts; Fig. 4, a similar view of one of
55 the side parts of the hinge, two of which are

employed and both of which are of the same form; Fig. 5, a section on the line 5 5 of Fig. 1 and showing the hinge connected with the door-frame and the door; Fig. 6, a section on the line 6 6 of Fig. 1 and showing the hinge
60 connected with the frame and the door and showing the door swung to an angle of ninety degrees or at right angles to the frame; Fig. 7, a section on the line 7 7 of Fig. 1 and showing the door swung in the opposite posi-
65 tion to that of Fig. 6; Fig. 8, a view similar to Fig. 1, but showing the section form of my improved hinge; Fig. 9, a perspective view of the central part of the hinge shown in Fig. 8; Fig. 10, a perspective view of a
70 supplemental intermediate part, two of which are employed and both of which are of the same form; Fig. 11, a perspective view similar to Fig. 4, of one of the side parts of the hinge shown in Fig. 8, two of which are employed and
75 both of which are of the same form; Fig. 12, a section on the line 12 12 of Fig. 8 and showing the hinge secured to the door-frame and door and showing the door in a closed position; Fig. 13, a section on the line 13 13 of Fig. 8
80 and showing the hinge secured to the door-frame and door and showing the door swung through an arc of one hundred and eighty degrees in the direction of the arrow x of Fig. 12; Fig. 14, a section on the line 14 14 of Fig.
85 8 and showing the door swung through an arc of one hundred and eighty degrees and in the direction of the arrow x^2 of Fig. 12; Fig. 15, a view similar to Figs. 1 and 8, but showing the third form of my improved hinge; Fig.
90 16, a view similar to Fig. 15, but showing the opposite side of the hinge; Fig. 17, a perspective view of the central part of the hinge employed in this construction, which consists of three parts; Fig. 18, a perspective view of
95 the parts shown in Fig. 17, but showing the opposite side thereof; Fig. 19, a section on the line 19 19 of Fig. 15, but showing the hinge secured to the door-frame and door and showing the door in a closed position; Fig.
100 20, a section on the line 20 20 of Fig. 15 and showing the hinge secured to the door-frame and door and showing the door swung through an arc of one hundred and eighty degrees and in the direction of the arrow x^3 of Fig. 19;
105 and Fig. 21 a section on the line 21 21 of Fig. 15, but showing the hinge secured to the door-frame and door and showing the door swung through an arc of ninety degrees and in the direction of the arrow x^4 of Fig. 19.

In the practice of my invention, reference being made to Figs. 1 to 7, inclusive, I provide a hinge which comprises a central body member a . (Shown in perspective in Fig. 3 and in transverse central section in Fig. 5, in plan view in Fig. 6, and in section on the line 7-7 of Fig. 1 in Fig. 7.) The central member a comprises an oblong block having segmental and longitudinal grooves or recesses a^2 in its opposite sides, at the ends of which are segmental keepers or grooves a^3 , formed by segmental flanges a^4 and corresponding V-shaped pieces a^5 , and in each of the longitudinal grooves or recesses a^2 in the opposite sides of the central part a and at one side of said grooves is a lug or projection forming a stop a^6 . In connection with the central part a of the hinge is employed two side members b , comprising end plates b^2 and a central oblong body portion b^3 , segmental in cross-section on its outer side and preferably plain on its inner side, and the body portions b^3 of the side parts b fit in the side grooves a^2 of the central part a . The body portion b^3 of the side parts b is provided at one edge thereof and on the convex surface thereof with a lug or projection forming a stop b^4 , and the stops b^4 of the side parts b of the hinge operate in connection with the corresponding stops a^6 of the central part a . Each end of the body portion b^3 of the side parts b of the hinge is provided with a segmental head b^5 , and in the adjacent or inner surfaces of these heads b^5 are segmental grooves or keepers b^6 , formed by segmental flanges b^7 , which fit in the grooves or keepers a^3 of the central part a of the hinge when all the parts of the hinge are connected.

In Fig. 5 of the drawings the hinge shown in Fig. 1 is secured to or in a door-frame c and to or in a door d , and this connection is so made that when the door is closed the hinge is invisible, and in order to do this the door-frame is provided with a cavity or recess c^2 and the door with a cavity or recess d^2 , which receive the body portion of the hinge, and the end plates b^2 of the side parts b of the hinge are also countersunk and secured in the door-frame and door, as shown in Figs. 6 and 7 at the entrance to the recesses c^2 and d^2 . One side of the recess c^2 in the frame c in the form of construction shown is curved or segmental in form, as shown in Fig. 5, and the opposite side of the recess d^2 in the door d is similarly formed in order to provide for the swinging of the hinge, as hereinafter described, and in the form of construction shown the frame is also provided with a supplemental recess c^3 and the door with a supplemental recess d^3 , and in these recesses are placed strong spiral springs d^4 , through which are passed rods d^5 , which are connected with the sides of the central part a of the hinge at right angles to the sides in which the grooves a^2 are formed, as clearly shown at d^6 , and the springs

d^4 are held in place by plates d^7 , through which the rods d^5 are passed, said plates being secured in the door and door-frame. It will be understood that the body portion b^3 of the parts b of the hinge are free to turn in the grooves or concave sides a^2 of the central part a , and the stops b^4 and a^6 of said parts operate to prevent the parts of the hinge from being disconnected in the operation thereof. When the parts of the hinge have been assembled as herein shown and described and secured to or in the frame and door, the door may be swung through an arc of ninety degrees, as shown in Fig. 6, in one direction or through a corresponding arc of ninety degrees in the opposite direction, as shown in Fig. 7. When the door is swung as shown in Fig. 6, the central part a of the hinge remains stationary; but when the door is swung in the opposite direction, as shown in Fig. 7, the central part a of the hinge also turns or moves with the door, as clearly shown in said figure, and the springs d^4 operate to hold the door in the closed position and return it to such position after it has been opened, and any desired number of such springs may be employed; but my invention is in no way limited to the exact arrangement of these springs herein shown and described, as any arrangement of springs or automatic devices which would accomplish the same purpose may be employed, and if it is desired to operate the door only by hand no springs or automatic devices of this class will be necessary.

In the construction shown in Figs. 8 to 14, inclusive, my improved hinge consists of five parts—a central part f , which takes the place of the central part a in the form of hinge shown in Fig. 1, together with two side parts b exactly the same in all respects as the side parts b shown in Figs. 1, 2, and 4, and two supplemental inner side parts e , which are segmental in cross-section and provided with segmental heads e^2 , in which are formed segmental grooves or keepers e^3 , which form inner and outer segmental flanges e^4 and e^5 —and the concave surfaces of the parts e are provided at one side thereof with a lug or projection forming a stop e^6 , and the convex surface of said parts are provided at one side thereof with a lug or projection at the opposite side thereof, forming a stop e^7 , and the stops e^6 operate in connection with the stops b^4 on the side parts b of the hinge, while the stops e^7 operate in connection with corresponding stops on the part f of the hinge, as hereinafter described. In this form of construction the central part f of the hinge is provided in its opposite sides with longitudinal grooves f^2 , forming two surfaces concave in cross-section and similar to the grooves a^2 in the part a . (Shown in Fig. 3.) At each end of the concave surfaces f^2 in the part f , however, are segmental grooves or keepers f^3 , forming segmental flanges f^4 , and in assembling the parts of this hinge the sup-

plemental inner side members e are passed into the concave surfaces or side portions f^2 of the part f from one side thereof, the segmental flanges f^4 fitting in the end grooves or keepers e^3 of the parts e , and the concave side portions f^2 of the part f are provided at their opposite sides with lugs or projections forming stops f^5 , which operate in connection with the stops b^4 of the side parts b . In assembling the parts of the hinge, as above described, the flanges b^7 of the side parts b also fit in the segmental grooves or keepers e^3 in the central parts e of the hinge, said grooves being made wide enough to receive the flanges f^4 of the part f and also the flanges b^7 on the heads b^5 of the parts b . As thus constructed it will be seen that all the parts of the hinge shown in Fig. 8 are free to slide one upon another within certain limits, and the movement of said parts are circular movements, which is also true of the form of hinge shown in Figs. 1 to 7, inclusive.

In Figs. 12 to 14 I have shown a door-frame and door provided with the form of hinge shown in Fig. 8, two or more of which may be employed, and in this form of construction the door-frame and door are exactly the same as in Figs. 5 and 7, with the exception that the frame is made thinner, so as to enable the door to swing in either direction through a complete circle, or through three hundred and sixty degrees, and in this form of construction the door-frame and door are recessed in the same manner as in Figs. 5 to 7, the springs d^4 , rods d^5 , and plates d^7 are employed, and the rods d^5 are connected at d^6 with the opposite sides of the central part f of the hinge by means of staples, loops, or similar devices d^6 , connected with said central part f . In Fig. 13 the door is swung in the direction of the arrow x of Fig. 12 through an arc of one hundred and eighty degrees, and in this operation one of the inner segmental side members e turns in the central part f and with the side part b , secured to or in the door, while the said side part b also turns with the door and on the said member e . In Fig. 14 the door is swung in the direction of the arrow x^2 of Fig. 12 through an arc of one hundred and eighty degrees, and it will therefore be seen that with this construction the door may be swung through a complete circle, and in swinging the door in the manner shown in Fig. 14 the central part a of the hinge turns with the door and while one of the intermediate side members e turns in or on the central part f and with the door in connection with the side part b , secured to the door. It will therefore be seen that the difference between the actual construction of the hinge shown in Fig. 8 and that shown in Fig. 7 lies in the form of the central part of the hinge, said part being designated by the reference character f in the form of hinge shown in Fig. 8, and by the reference character a in the form of hinge shown in Figs. 1

and 2, and in the supplemental inner side parts e , which are employed in the form of hinge shown in Fig. 8 and which are not employed in connection with the form of hinge shown in Figs. 1 and 2.

In the form of construction shown in Figs. 15 to 21, inclusive, I provide a hinge which consists of four parts, and in this form of construction the side parts b^3 are exactly the same as in the form of construction shown in Figs. 1 to 7, inclusive, and Figs. 8 to 14, inclusive, and two of said parts are employed. In this form of construction I also employ a central part g , which takes the place of the central part a , (shown in Figs. 1 to 7, inclusive,) and the central part f . (Shown in Figs. 8 to 14, inclusive.)

The part g is shown in opposite side and perspective views in Figs. 17 and 18 and in section in Figs. 19 and 20, and said part consists, as in the first two forms of construction hereinbefore described, of an oblong block g , having longitudinal concave surfaces on its opposite sides formed by grooves g^2 and which are segmental in cross-section. One side of the block g is shorter than the opposite side, and the shorter side is provided at its opposite ends with projecting segmental flanges forming keepers g^3 , which are formed on a smaller radius than that of the segmental side surfaces g^2 , and the opposite side of said part g , or the longer side thereof, is provided at its opposite ends with segmental grooves or keepers g^4 , formed by segmental flanges g^5 , and the radius of which is less than that of the segmental grooves or side surfaces g^2 . The opposite sides of the part g of the hinge are provided in the opposite sides of the segmental surfaces or grooves g^2 with stops g^6 . This form of hinge also involves an intermediate part e , which is exactly the same as the intermediate part e (shown in Fig. 10) of the hinge shown in Fig. 8, and in assembling the parts of the hinge shown in Figs. 15 to 16 the intermediate part e is inserted into the concave side of the part g , provided with the grooves g^4 and flanges g^5 , said flanges fitting in the grooves e^3 in the end of the part e . One of the side parts b^3 is then slipped into position in the part e , the flanges b^7 at the ends thereof also fitting in the grooves e^3 in the part e . The other side part b^3 is then connected with the opposite side of the central part or block g , the flanges g^3 fitting in the grooves b^6 in the end heads b^5 of the said part b . When the parts of the hinge are thus connected, they will be free to move one upon another, the motion of said parts being in circles, and this motion is limited by the stops g^6 , e^6 , and b^4 on the parts g , e , and b . In Figs. 19 to 21 I have shown a door-frame and door provided with the hinge shown in Figs. 15 and 16, and the door-frame and door in this form of construction are exactly the same as in Figs. 12 to 14, inclusive, and the connection of the hinge with the door-frame and door is made in the same

manner. With this form of construction, however, the door may be swung in the one direction, as indicated by the arrow α^3 in Fig. 19 and as shown in Fig. 20, through an arc of one hundred and eighty degrees, and said door may be swung in the opposite direction, as indicated by the arrow α^4 in Fig. 19, through an arc of ninety degrees, as shown in Fig. 21, the combined movement of the door in opposite directions being through an arc of two hundred and seventy degrees.

It will also be seen that in each form of construction the hinge consists of a central part or member and side parts or members mounted in or connected with the opposite sides of the central part or member and adapted to turn therein or thereon in circles, said central part or member being provided in its opposite sides in the form of construction shown with longitudinal grooves or recesses which are segmental in cross-section and the side parts or members being formed so as to turn therein, said central part or member and said side parts or members being provided with interlocking segmental members which, taken in connection with the grooves or spaces in the central part or member, form keepers which connect said parts and render them movable one upon another. This is the main idea of the construction in each form, and in the construction shown in Figs. 8 to 14, inclusive, the connection between the central part or member and the side parts or members is made by means of intermediate segmental members mounted in the opposite sides of the central part or member and with which the side parts or members are movably and operatively connected, while in the form of construction shown in Figs. 15 to 21, inclusive, one of the side parts or members is connected directly with the central part or member and the other side part or member is connected with the central part or member by means of an intermediate segmental member.

In the foregoing specification I have described three separate forms of my improved hinge by means of which three different results are produced in the operation of opening or closing a door or by means of which a door may be swung through arcs of different dimensions. My invention, however, is not limited to the exact details of construction herein shown and described nor to the form of the springs employed and the method of connecting the same with the hinge or with the door-frame and door, and various changes in and modifications of the construction herein described may be made without departing from the spirit of my invention or sacrificing its advantages.

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

1. A hinge comprising a central block-shaped body portion, the opposite sides of

which are segmental in cross-section and supplemental segmental members mounted in the opposite sides of said body portion and adapted to swing in circles corresponding with the arcs on which the sides of the body portion are formed in cross-section, said parts being provided with means for holding them in operative connection, substantially as shown and described.

2. A hinge, comprising a central member having keepers in its opposite sides which are segmental in cross-section, and side members mounted in said keepers and adapted to turn therein and to be secured to a door-frame and door, substantially as shown and described.

3. A hinge, comprising a central member having keepers in its opposite sides which are segmental in cross-section, and side members mounted in said keepers and adapted to turn therein and to be secured to a door-frame and door, and means for limiting the movement of the parts of the hinge one upon another and holding them together, substantially as shown and described.

4. A hinge, comprising a central member having keepers in its opposite sides which are segmental in cross-section, side members mounted in said keepers and adapted to turn therein and to be secured to a door-frame and door, and means for returning the door to a closed position after it has been opened, substantially as shown and described.

5. A hinge, comprising a central member having keepers in its opposite sides which are segmental in cross-section, side members mounted in said keepers and adapted to turn therein and to be secured to a door-frame and door, and means for returning the door to a closed position after it has been opened, consisting of springs secured to the door-frame and door and in connection with a part of the hinge, substantially as shown and described.

6. A hinge, comprising a central member, a side member in operative connection with one side thereof, and another side member in operative connection with the opposite side thereof, said side members being adapted to turn through opposite arcs on said central member, the centers of said arcs being in line with the axial center of said central member, substantially as shown and described.

7. A hinge, comprising a central member, a side member in operative connection with one side thereof and with a door-frame, and a side member in operative connection with the other side of said central member and with a door, and said side members being adapted to turn through an arc of a circle on said central members, and means for limiting said movement, substantially as shown and described.

8. A hinge, comprising a central member, a side member in operative connection with one side thereof and with a door-frame, and a side member in operative connection with

the other side of said central member and with
a door, and said side members being adapted to
turn through an arc of a circle on said central
members, and means for limiting said move-
5 ment, and devices for returning said members
to their normal positions, substantially as
shown and described.

In testimony that I claim the foregoing as

my invention I have signed my name, in pres-
ence of the subscribing witnesses, this 4th day 10
of November, 1904.

JOSEPH SOSS.

Witnesses:

F. A. STEWART,
C. J. KLEIN