

L. S. SHERWOOD.
HINGE.

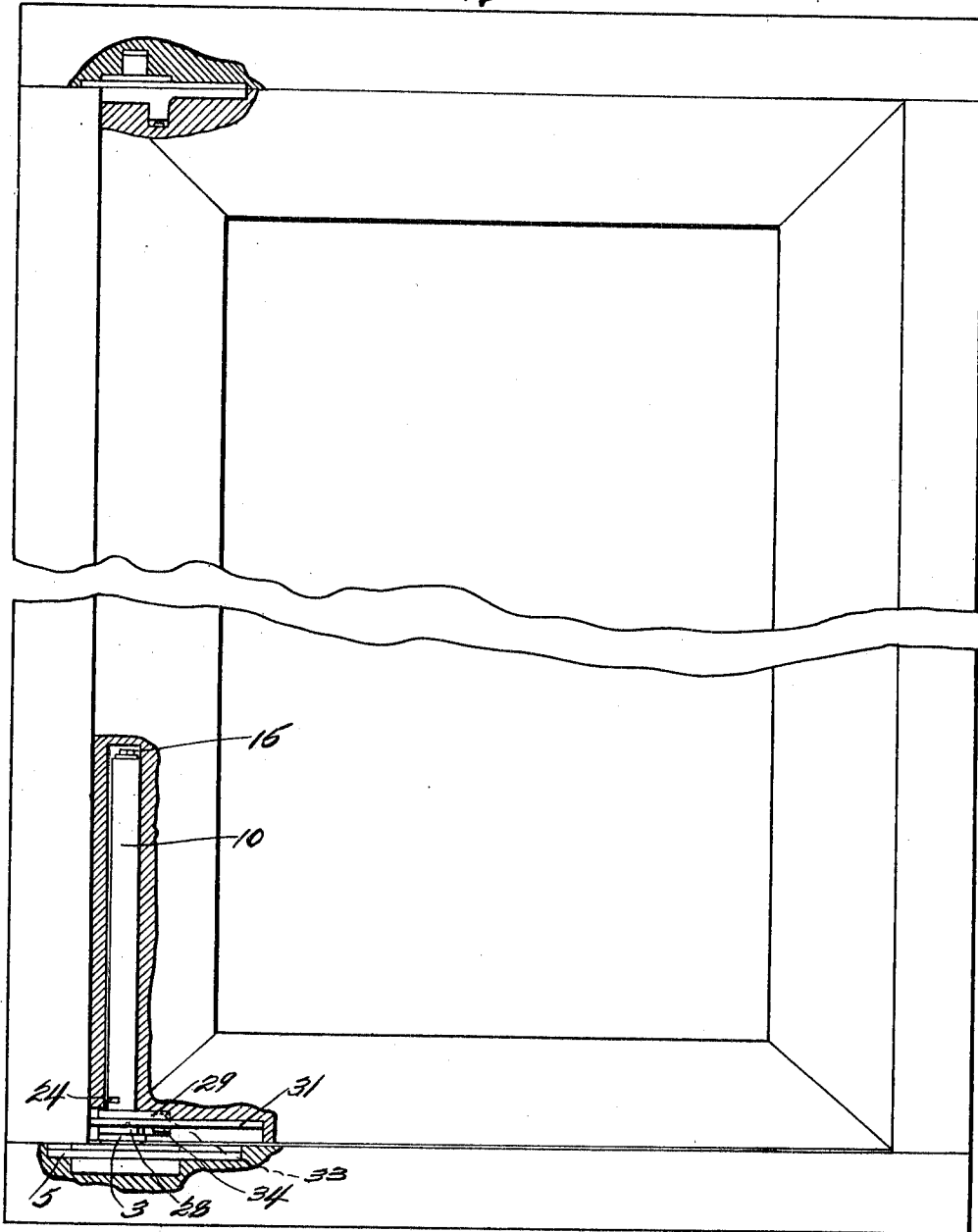
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1,105,852.

Patented Aug. 4, 1914.

2 SHEETS-SHEET 1.

Fig. 1.



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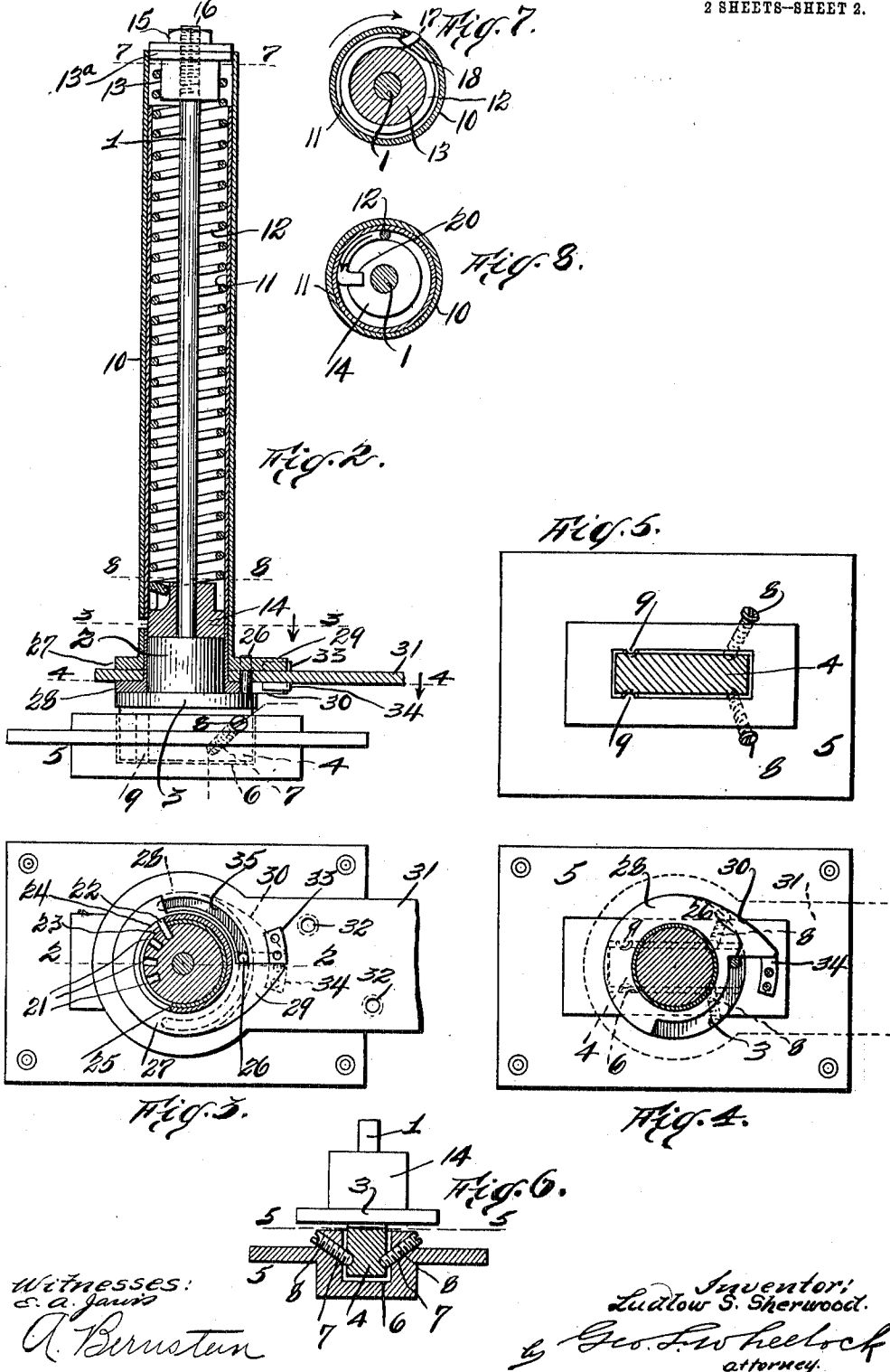
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UNITED STATES PATENT OFFICE.

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HINGE.

1,105,852.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LUDLOW S. SHERWOOD, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Hinges, of which the following is a specification.

This invention relates to hinges, more particularly to what are usually known as floor hinges in which the hinge is applied to the threshold of the door frame instead of being applied to the back edge of the door and to the sides of the door frame, although it is obvious that the said hinge may be applied to the top of the door frame. Whether the hinge be applied to the top of the door frame or the bottom, there is usually at the other end of the door a swivel which is co-incident with the axis of the hinge, so that the door swings as on two pivots, one at the top and one at the bottom of the door.

Certain objects of the invention are to provide a simple, practical and efficient hinge which will be double acting so that the door can be swung in either direction.

Further objects are to provide improved means for winding the actuating spring whether the door be swung in one or the opposite direction; that is to say the spring is wound if the door be swung in one direction and is also wound if it is swung in the opposite direction, the unwinding of the spring closing the door.

Another object of the invention is to provide simple and efficient means for adjusting the door if the carpenter has bored a slightly inclined mortise in the door instead of a mortise which extends parallel with the edges and sides of the door, such mortise receiving the spring casing or barrel.

These being among the objects of the present invention, the same consists of certain features of construction and combinations of parts to be hereinafter described and then claimed with reference to the accompanying drawings illustrating a suitable embodiment of the invention, and in which—

Figure 1 is an elevation showing a door and its frame provided with a hinge construction made in accordance with the present invention, the door and frame being partly broken away to illustrate the hinge parts; Fig. 2 is a longitudinal section of the hinge partly in elevation, the said section being taken on the line 2—2 Fig. 3; Fig. 3 is a transverse section on the line 3—3 Fig.

2; Fig. 4 is a transverse section on the line 4—4 Fig. 2; Fig. 5 is a transverse section on the line 5—5 Fig. 6; Fig. 6 is an elevation, partly in vertical section; said Figs. 5 and 6 showing the means for adjusting the hinge if it be required; Fig. 7 is a transverse section on the line 7—7 Fig. 2; and Fig. 8 is a transverse section on the line 8—8 Fig. 2.

Referring to the drawings, the pintle 1 consists of an elongated metallic rod having at one end a cylindrical bearing 2 consisting preferably of an enlargement having a lateral flange or extension 3, which may be cast integral with the bearing 2 or obviously it can be made as a separate disk screwed or otherwise secured to the bearing 2. On the outer face of the flange or disk 3 is a preferably oblong engaging member 4 which is cast integral or otherwise mounted on the flange or disk 3. The described parts support or form part of the main portion of the hinge and the engaging member 4 provides means for mounting or attaching the same to a base 5. Said base 5 is provided with a socket 6 into which the engaging member 4 is inserted, but it is obvious that the socket may be on the main body of the hinge and the engaging member on the base. Inclined screw threaded holes 7 extend through opposite walls of the socket 6 to receive set screws 8, see more particularly Fig. 6, although reference may also be had to Figs. 2 and 5. The said screw threaded holes are at one end of the socket 6 while within the opposite end of the socket are inwardly projecting fulcrums or bearings 9 preferably extending from top to bottom of said socket. One end of the engaging member 4 bears at opposite sides against the fulcrums 9, while the inner ends of the set screws 8 engage with the opposite end of the engaging member.

The object of this construction shown in detail in Figs. 5 and 6 is for the purpose of adjusting the main portion of the hinge, in case the barrel or casing 10 has been set by the carpenter into a mortise bored into the end of the door at a slight angle or inclination to the longitudinal axis of the door. The manner of adjustment is obvious. Within the barrel or casing 10 which constitutes a portion of a spring straining member is a barrel or tubular portion 11 which constitutes a part of another straining member. The helical spring 12 is confined in the barrels or casings 10 and 11 and the

latter are connected to wind or be actuated by the unwinding of the spring as follows: Plugs or bushings 13, 14 are respectively located in opposite ends of the barrel or casing 10, the plug 13 fitting into the outer end of the barrel 10 and the plug 14 which constitutes a spring attaching member is fitted into the inner barrel. A nut 15 is screwed onto the screw threaded outer end 16 of pintle 1 which extends through the spring, and said nut bears against the surface of the plug 13, thereby holding the said plug in place. One end 17 of spring 12 is bent outwardly and is seated in a notch or recess 18 in the outer end of the barrel or casing 10, and said plug 13 is flanged at 13^a so as to lie above the bent out end 17 of the spring and retain the same in its notch or recess 18. The other end 19 of said spring is bent inwardly and is seated in a notch or recess 20 in the attaching member or plug 14. Said plug 14 serves in part in connection with other devices to adjust the normal tension of the spring, to which end the said plug is provided with a series of peripheral holes 21, into either of which may be inserted a tension or retaining pin 22 as shown more clearly in Fig. 3. Pin 22 projects from the plug 14 and enters a transverse slot 23 in the inner barrel or casing 11 and a slot 24 in the outer casing or barrel 10. When the tension of the spring 12 is adjusted from its inner end by the tension plug 14, the pin 22 is by the tension of the spring thrown against one end of each of the slots 23, 24, and when the hinge is operated in swinging the door inwardly or outwardly, the said pin strikes a stop or abutment 25 formed by the other end of slot 24.

Extending from and at right angles to the flange or disk 3 is a stop device preferably comprising a pin or projection 26 which extends substantially parallel with the pintle 1 and the spring barrel, and its position corresponds with the position of the door when closed and prevents the door when it is closing, after it has been opened, from remaining beyond closed position. Parts cooperate with said stop pin 26 consisting of a plate 27 on barrel 10 and having an extension or lug 29 and a plate 28 on barrel 11 having a lug or extension 30. Normally, that is to say, in the closed position of the door, lug or extension 27 abuts against one side of the stop device or pin 26 while the lug or extension 30 abuts the opposite side of the same. The inner barrel or casing 11 extends a distance beyond the plate 27 on barrel 10 so that the plate 28 on the said inner casing or barrel is spaced away from the plate 27, and in the space between the two planes of the two plates 27, 28, and which planes are transverse to the axis of the hinge, there is located a door operating

lever 31 which is provided with an eye to receive the inner barrel or casing 11. The latter constitutes a bearing for the operating lever, while the surfaces of the plates at opposite sides of said lever are bearing surfaces for said lever. Door operating lever 30 is preferably provided with holes 32 to receive screws or other fastenings, whereby the projecting end of the operating lever is secured to the end of the door to which the hinge is to be applied. Located on one face of the operating lever 31 is an abutment 33 which strikes the lug or extension 29 when the door closes in one direction, and located on the opposite face of the lever is an abutment 34 which strikes the lug or extension 30 when the door closes in opposite direction. To permit the swinging movement of the lever 31 the same is provided with an arcuate slot 35 which is concentric with the pivot of the lever, and through the said slot the fixed pin 26 projects.

The operation of the described hinge is as follows: Assuming that a door is mounted on the hinge in the substantial manner shown in Fig. 1 and that a person in opening the door opens it away from that side of abutment 33 on which the lug or extension 29 is located, this opening movement will cause the abutment 33 on the operating lever by its engagement with the lug or extension 29 to carry one straining member consisting of the barrel or casing 10 and concomitant parts around in that direction. The door may be swung entirely open so as to stand at right angles to its closed position or substantially so, and the door is prevented from being moved beyond such wide open position by means of the pin 22 on the plug 14 striking the closed end 25 of the slot in the outer barrel or casing. During the said opening movement, rotary motion is imparted to the barrel or casing 10 from one end thereof, while the spring 12 is wound up or placed under tension by the opposite end of the said barrel or casing. When the person who has opened the door in the direction indicated releases it, the spring will react and automatically close the door, bringing the pin 22 in contact with that end of the slot in the inner barrel or casing which is opposite to the point 25, and at the same time return the lug or extension 29 into contact with the stationary stop pin 26. When a person opens the door in opposite direction, that is to say, goes through the door in the direction opposite to the first, the abutment 34 on the operating lever bears against the lug or extension 30, and if the door be fully opened, the plate 28 and the inner casing or barrel 11 are given a quarter rotation, and the spring is wound from its opposite end; the transmitting parts being the rotating casing or barrel 11, and the pin 22 which is given a quarter turn or substan-

tially so by contact of the closed end of the slot in the said barrel or casing 11 therewith, these movements resulting in the partial rotation of the plug 14 which is attached to the spring. When the door is released the spring reacts and causes the pin 22 to carry the barrel or casing 11 back to its original position, and to carry the lug or extension 30 into contact with the stop pin 26. It will be observed that whether the door be swung inwardly from the door frame or outwardly by a person passing through the doorway, the spring will always be wound up, so that its full strength will react and close the door after it has been released.

While the hinge as described consists of quite a number of parts, yet the organized hinge is comparatively simple and compact and takes up very little space, owing to the fact that several of the parts of the hinge each perform more than one function. It is obvious that the hinge described and shown may be modified as by altering the construction of some parts, omitting some of the parts or adding others without departing from the scope of the invention. It is of course to be understood that the side, hinge edge of the door is to be rounded off as usual or the joint between said edge and the door frame is to be so constructed as not to interfere with the swinging of the door.

What I claim as new and of my invention is:

1. In a hinge, the combination of a spring, means for straining said spring from one point in one direction and comprising a barrel or casing for said spring, a second means for straining said spring from another point in opposite direction, a spring attaching member at said other point mounted within said barrel or casing, means for coöperatively connecting said second straining means and said attaching member and for adjusting the tension of said spring, a door swinging lever arranged to act under pressure in one or the opposite direction on one or the other of said straining means and to be acted on by the same, and stopping means in common with both said straining means toward which said straining means are adapted to move under action of said spring to restore said lever to normal position.

2. In a hinge, the combination of a spring, means for straining said spring from one point in one direction and comprising a barrel or casing for said spring, a second means for straining said spring from another point and in opposite direction, a spring attaching member at said other point, mounted within said barrel or casing and having a number of holes, a tension pin for insertion in either of said holes to set the normal spring tension, said pin engaged by said second straining means, a door swinging lever arranged to act under pressure in one or the opposite

direction on one or the other of said straining means in common with both said straining means and to be acted on by the same, and stopping means toward which said straining means are adapted to move under action of said spring to restore said lever to normal position.

3. In a hinge, the combination of a spring, means for straining said spring from one point in one direction and comprising a stop, a second means for straining said spring from another point and in opposite direction and comprising also a stop, said stops lying in two planes transverse of the axis of the hinge, a door swinging lever arranged to act under pressure in one or the other opposite direction on one or the other of said straining means, and to be acted on by the same, said lever being arranged between said two planes of said stops and provided with abutments on its opposite surfaces to engage said stops, and stopping means against which said straining means are adapted to move said stops and to restore said lever to normal position.

4. In a hinge, the combination of a spring, means for straining said spring from one point in one direction and provided with a stop, a second means for straining said spring from another point in opposite direction and also provided with a stop, said stops standing outwardly from both of said means, a door swinging lever arranged between said stops to act under pressure in one or the opposite direction on one or the other of said straining means and to be acted on by the same, said lever having a curved slot, abutments on said lever to engage said stops, and stopping means projecting through said slot and toward which said straining means are adapted to move said stops against said stopping means and to restore said lever to normal position.

5. In a hinge, the combination of a spring, means for straining said spring from one point in one direction and comprising a barrel or casing for said spring, said barrel or casing having a transverse slot, a second means for straining said spring from another point in an opposite direction, a spring attaching member at said other point mounted within said barrel or casing, an adjustable pin carried by said attaching member for setting the spring tension to normal, said pin engaged by said second straining means and projecting into said slot of said barrel or casing, a door swinging lever arranged to act under pressure in one or the opposite direction on one or the other of said straining means and to be acted on by the same, and stopping means toward which said straining means are adapted to move under action of said spring to restore said lever to normal position.

6. In a hinge, the combination of a base,

door moving mechanism, one of said parts having a socket and the other of said parts having an engaging member to enter said socket, projecting fulcrums or bearings
5 on one of said parts, located to one side of the axis of the hinge and with which the other of said parts has contact, and adjusting screws located at the other side of the hinge-axis at opposite sides of
10 said socket adapted to bear on said engaging member to adjust the position of said door moving mechanism relatively to said base.

7. In a hinge, the combination of a spring, means for straining said spring from one
15 point in one direction and comprising a barrel or casing for said spring and a stop, a second means for straining said spring from another point and in opposite direction and comprising also a stop, said stops projecting
20 in the same general direction but in two planes transverse to the axis of the hinge, and a door swinging part arranged to act under pressure in one or the opposite direction on one or the other of said straining
25 means, and to be acted on by the same, said

door swinging part being located in a plane between the two planes of said stops and provided with means between said stops to engage them.

8. In a hinge, the combination of a spring, 30 means for straining said spring from one point in one direction, a second means for straining said spring from another point in opposite direction, a spring attaching member at said other point, means for coopera- 35 tively connecting said second straining means and said attaching member and for adjusting the tension of said spring, said first straining means constituting an abutment and stop for said connecting means, a 40 door swinging lever arranged to act under pressure in one or the opposite direction on one or the other of said straining means and to be acted on by the same, and means for the abutment of said stops.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."