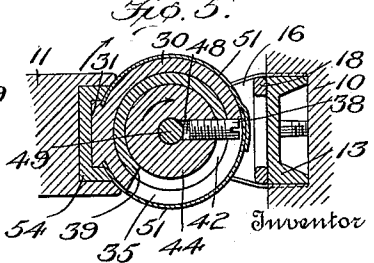
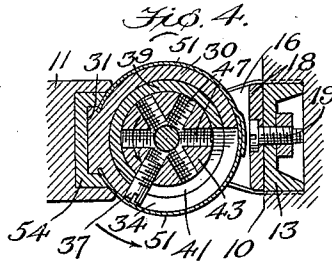
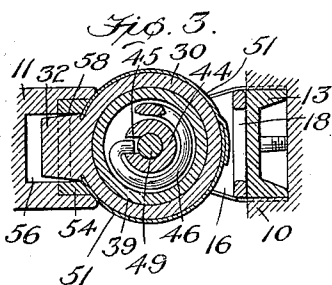
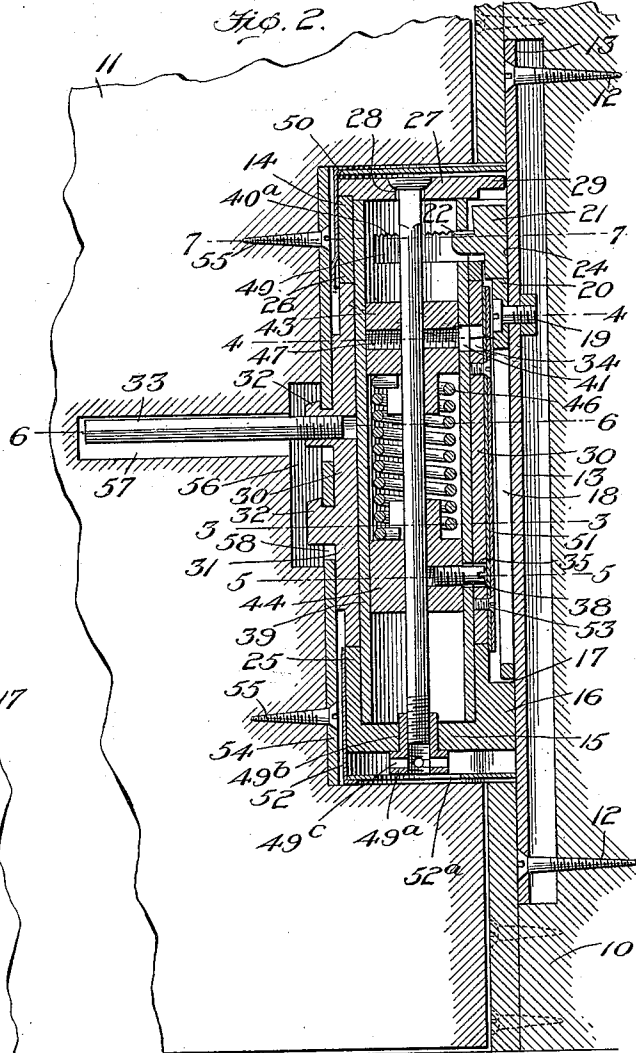
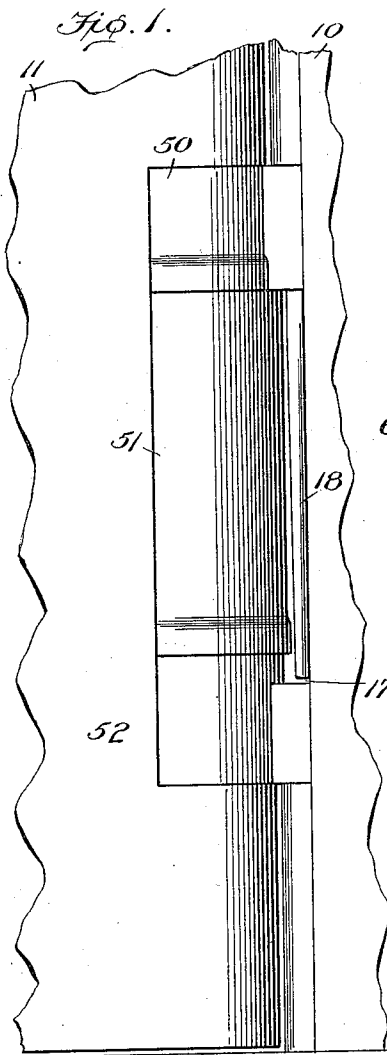


J. A. FISCHER.
DOUBLE ACTING SPRING HINGE.
APPLICATION FILED MAR. 8, 1910.

Patented June 21, 1910.

962,330.

2 SHEETS—SHEET 1.



Witnesses

Edwin L. Bradford

F. W. Ernst

John A. Fischer,
By M. E. Doyle

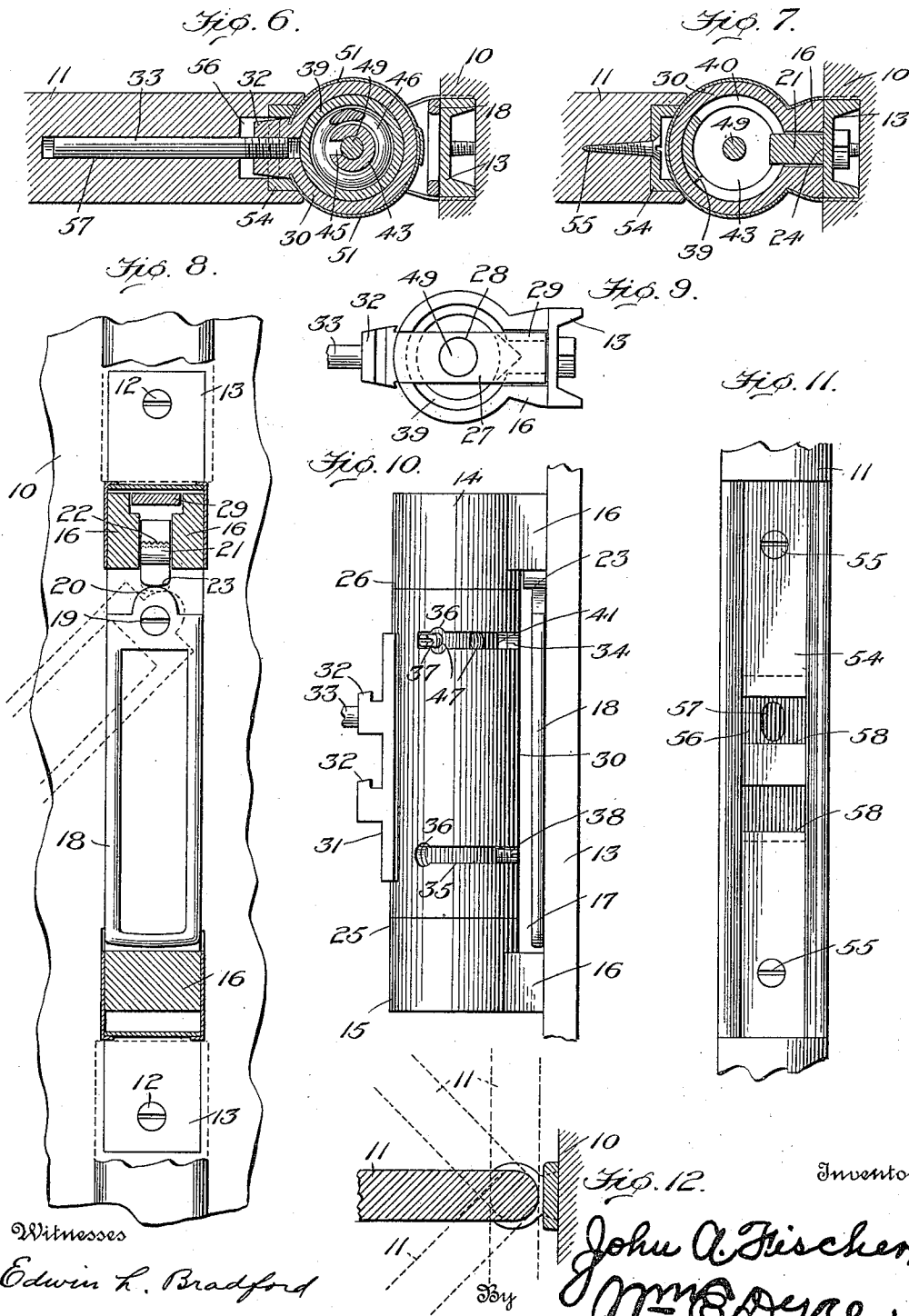
Attorney

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UNITED STATES PATENT OFFICE.

JOHN A. FISCHER, OF MEMPHIS, TENNESSEE.

DOUBLE-ACTING SPRING-HINGE.

962,330.

Specification of Letters Patent. Patented June 21, 1910.

Application filed March 8, 1910. Serial No. 548,002.

To all whom it may concern:

Be it known that I, JOHN A. FISCHER, a citizen of the United States, residing at Memphis, in the county of Shelby and State of Tennessee, have invented certain new and useful Improvements in Double-Acting Spring-Hinges; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to double acting spring hinges for doors, and is a structural improvement upon the subject-matter of U. S. Letters-Patent No. 941,239, issued to me November 23, 1909.

It has, among other objects, that of economy and simplicity of construction, durability, and a maximum degree of efficiency. As a further object my invention contemplates the production of double acting hinges equally suitable, without alteration, for right or left hand, inside or outside, double or single, full length or short doors, shutters, swinging windows and screens. It also provides convenient means for instantly converting the structure into one of springless action; means for readily adjusting the spring tension by skilled or unskilled persons either before or after a door is hung; and means for returning a door with accuracy and precision to a position of rest at any predetermined angle with relation to the plane of the door sill, or into a plane co-incident therewith, as may be desired, the latter adaptation constituting in effect an efficient door-check.

The invention will be hereinafter particularly described and pointed out in the claims following.

In the accompanying drawings which form part of this application, and wherein corresponding numerals of reference indicate like parts in the several views: Figure 1 represents in side elevation the exterior surface of one of my improved hinges as applied to fragments of a door and door-jamb. Fig. 2 is a vertical central section through one complete hinge, in the plane of the door, showing also a fragmentary section of the door and door-jamb. Fig. 3 is a horizontal section of the invention taken on the line 3—3, Fig. 2. Fig. 4 is a horizontal section taken on the line 4—4, Fig. 2. Fig. 5 is a horizontal section on the line 5—5, Fig. 2. Fig. 6 is a horizontal section on the line

6—6, Fig. 2. Fig. 7 is also a horizontal section on the line 7—7, Fig. 2. Fig. 8 is a fragmentary edge view of a door-jamb with a portion of my invention affixed thereto including in front elevation a double acting locking lever. Fig. 9 is a plan view of hinge and its supporting plate detached. Fig. 10 is a side elevation of one complete hinge with its outer casing removed. Fig. 11 is a fragmentary edge view of a door showing in front elevation a door attaching or holding plate. Fig. 12 is a horizontal sectional view showing diagrammatically a fragment of a door-jamb and door, several adjusted positions of the latter being indicated by dotted lines.

Reference being had to the drawings and numerals thereon, 10 indicates a door-jamb and 11 a door fitted thereto. Mortised into the vertical hinge surface of jamb 10 and therein secured as by screws 12, is a flush supporting plate 13 channeled upon its rear surface for purposes of strength and lightness, and provided with forwardly projecting horizontally arranged fixed hinge members 14 and 15 forged integral therewith or otherwise secured in any desirable manner. Both members 14 and 15 are bracketed or offset from the supporting plate 13 as at 16, thus insuring a vertical space 17 for the reception of a locking lever 18 pivotally mounted near the upper end of said space as at 19. This lever is by preference of link form, as best shown by Fig. 8; it may, however, be of any other form, but in any event is provided with a cam 20, or its equivalent, at its upper end, adapted to normally rest beneath a vertically slidable dog 21 having a projecting tooth or teeth 22, (also best shown by Fig. 8), a rounded lower edge 23, and an extended flat rear surface 24 bearing squarely upon the outer surface of plate 13, all for purposes that will later appear.

In its preferred form of construction the lowermost fixed hinge member 15 is substantially cup-shaped, having an upstanding continuous flange 25, the uppermost fixed hinge member 14 being also of annular form with a downwardly projecting continuous flange 26, said flanges being in vertical alignment. The upper end of hinged member 14 is crossed by a removable bridge-block 27 flush with its upper edge, of slightly increasing thickness from front to back, having a central bolt hole 28, and having also an extension 29 still more reduced in

thickness, projecting into bracket 16 above dog 21.

Interposed between the opposing edges of flanges 25—26 of the fixed hinge members 14—15, respectively, and in vertical alinement therewith, is a relatively movable hinge member 30 of cylindrical form having upon its outer surface a vertically arranged plane face 31 from which latter project latch lugs 32—32, and a horizontal pin or lever 33 affording one means of attachment for the door 11 to the said movable hinge member 30; while at one side and back of said plane surface 31 above and below its horizontal center said movable hinge member 30 is provided with corresponding transverse slots 34—35 as illustrated by Fig. 10, the forward ends of both being enlarged as at 36 to permit introduction of upper and lower screws or pins 37—38 respectively, for purposes that will hereinafter appear.

Concentrically arranged within the movable hinge member 30, is a cylindrical sleeve or tubular pintle 39 extending above and below said member 30 into the fixed hinge members 14 and 15. Near its upper end, that portion of said tubular pintle 39 which projects into the fixed hinge member 14, is provided at its back with a transverse slot 40 having a serrated upper edge as 40^a with which the projecting teeth 22 of the aforesaid dog 21 normally engage. Below said slot 40 and in vertical alinement therewith, the tubular pintle 39 is likewise provided with upper and lower transverse slots 41—42, corresponding, and registering with slots 34 and 35 in the hinge member 30 aforesaid. Within the tubular pintle 39 are located upper and lower spring holders 43 and 44, each having a spring seat 45 which receives opposite ends of an actuating spring 46 as shown by Fig. 2. The said upper spring holder 43 is tapped and threaded radially at intervals, as shown at 47 (see Fig. 4), to receive the end of the screw or pin 37; and in like manner the lower spring holder 44 is tapped and threaded as at 48 (see Fig. 5), to receive the screw or pin 38; the former being designed to not only hold the spring after the tension has been fixed, but to afford means for operative connection with said holder 43 to wind the spring when the door is opened in one direction, while the latter affords means for operative connection with the holder 44 when the door is opened in the opposite direction to wind the spring from its lower end. These screws 37—38, projecting radially from their respective spring holders 43—44, pass through slots 34—41 and 35—42, in the members 30 and 39, respectively, where they rest in opposite ends of said slots, being retained normally in such position by action of the interposed spring 46, as indicated by Fig. 10.

Passing downwardly through bolt-hole 28

in the bridge-block 27, and centrally through spring-holders 43—44 and the spring 46, is a bolt 49 threaded upon its lower end and there engaged by an adjusting nut 49^a which latter enters the lower fixed hinge member 15 through a central smooth-bore opening 49^b, and is provided with radial perforations 49^c in its projecting head for the reception of a wrench pin (not shown).

Neatly surrounding all cylindrical parts represented by Fig. 10, is an outer shell or casing formed of sections 50, 51 and 52, overlapping in the order mentioned as shown by Fig. 1, serving not only to impart a finished appearance to the structure, but also as a water shed for the protection of the hinge members from rain and snow. The sections 50 and 52 are capped over the fixed hinge members 14 and 15, as shown in vertical section by Fig. 2 and in horizontal section by Fig. 7, the lower section 52, moreover, being perforated centrally as at 52^a and having slight vertical movement for the purpose of rendering accessible the adjusting nut 49^a, when desired. The intermediate casing section 51 is divided and overlapped vertically at its back, as shown by Figs. 2 and 6, and is secured to hinge member 30 by small screws 53—53, as shown by Fig. 2, or in any other approved manner.

Mortised into the hinge edge at door 11 is a holding plate 54 which may be secured by ordinary wood screws 55—55; beyond this is mortised a still deeper pocket 56, and communicating with the latter is a vertically elongated depression or hole 57 to receive the horizontal pin 33 aforesaid. This holding plate 54 is provided with rectangular perforations 58—58 through which are introduced the latch lugs 32—32 into pocket 56 when the door is hung.

Having thus described my invention, its use and operation are quite apparent and need not be dwelt upon at length. The parts having been adjusted for the ordinary closing of a double acting door or a pair of double doors hinged to opposite door-jambs, it will now be apparent by reference to the drawings, that a movement of the door in one direction as indicated by dotted lines at the bottom of Fig. 12, results in a rotary movement of the hinge member 30 and a consequent advance, as indicated by arrows in Fig. 4, of screw 37 carried by the trailing end of slot 34. As a consequence, spring holder 43 is rotated in the same direction as indicated by the central arrow in Fig. 4, thus placing spring 46 under increased tension. Naturally, the reverse action of that last described follows a release of the door, which thereupon is returned by reaction of the spring 46 to the plane of the door-sill, or that position of rest indicated by full lines in Fig. 12. A movement of the door in the opposite direction, or as indicated by dotted

lines at the top of Fig. 12, results in a corresponding movement from the opposite side of its pivotal center, actuated by the opposite end of spring 46 by agency of the opposite or low spring holder 44 and its cooperating screw 38 carried in the opposite end of seat 35, all as indicated by the arrows in Fig. 5 of the drawings.

During the aforesaid ordinary uses of the present invention it will be noted that the inner tubular pintle 39 is retained in fixed relation to the hinge members 14, 15, and the main supporting plate 13 by engagement of the teeth 22 upon dog 21 with the milled or roughened upper edge of the locking slot 40. If now it is desired to totally disconnect the spring 46 from its operative position, between the fixed and relatively movable hinge members, this may be instantly accomplished by a movement in either direction of the hand operated lever 18 as indicated by dotted lines in Fig. 8, whereupon withdrawal of the cam 20 permits dog 21 to gravitate out of engagement with the serrated edge of slot 40, and permits pintle 39 to turn idly with the door and its connected parts. If now it is desired to invariably return the door to some plane making a predetermined angle of rest with the normal vertical plane of the door, as, for example, either of those indicated by dotted lines in Fig. 12, the action of lever 18 and coacting parts last above referred to is reversed, the door having been first placed in said predetermined position, whereupon the spring action will be as before described, but to and from the angle of rest newly fixed upon. And, in connection with these adjustments, it will be particularly noted that the degree of pressure with which dog 21 forces the tubular pintle 39 upward into contact with the under side of bridge-block 27, depends upon the adjustment of nut 49^a at the lower end of central bolt 49, where said nut also performs the important function of compensating for the wear of parts. By reference to Fig. 2 it will be apparent that access to the nut 49^a may readily be obtained at all times by a slight upward movement of the lower casing section 52 without the necessity of removing either the door or hinges. A wire nail or any suitable wrench pin (not shown) first inserted in one of the radial perforations 49^c, may now be employed to set up said nut, and as a consequence, to draw bridge-block 27 down so as to compensate for wear; and, moreover, if desired, such adjustment may be continued to the point of positively locking the tubular pintle 39 against rotation by frictional contact of the said bridge-block upon its upper end, in which event an efficient double acting spring hinge of the type herein described is produced independent of the dog and lever features.

In connection with the operation of hang-

ing doors upon hinges constructed in accordance with the present invention, it will be noted that each hinge as it comes from the factory is a self contained structure including the actuating spring 46 properly energized, and that the entire structure is neatly inclosed or surrounded by the casing or water-proof closure 50, 51 and 52, of more or less ornamental design and finish. These hinges, including both fixed and movable members, are secured to door-jamb 10 by agency of the main supporting plate 13, whereupon the door 11 with its holding plates 54 mortised therein, as indicated by Fig. 2, is introduced over said hinges, the projecting latch lugs 32 of which enter recesses or perforations 58 of the holding plates 54. Upon reaching this position the said plates 54 and door 11 are permitted to drop vertically into the seated position indicated by Figs. 1 and 2 of the drawings, whereupon the space or opening thus formed beneath the hinge member 15 is snugly closed by a telescoping downward movement of the casing member 52.

Having thus described my invention in its preferred form of construction, and enumerated a few of the uses to which it is suited, it should be noted that I do not limit myself to the particular form and arrangement of parts hereinbefore set forth; on the contrary, various structural changes may be made and various parts substituted for those hereinbefore described without materially departing from the present invention as set forth in the following claims.

1. In a hinge the combination with relatively fixed and movable hinge members, of a tubular pintle within said members, an actuating spring within said pintle operatively connected with said movable hinge member through an opening in said pintle, and an adjustable bolt connecting said pintle and one fixed hinge member, substantially as described.

2. In a hinge the combination with relatively fixed and movable hinge members, of a tubular pintle within said members, an actuating spring within said pintle operatively connected at opposite ends with said movable hinge member through openings in said pintle, and an adjustable bolt connecting said pintle and one fixed hinge member, substantially as described.

3. In a hinge the combination with relatively fixed and movable hinge members, of a tubular pintle within said members, an actuating spring within said pintle operatively connected with said movable hinge member through an opening in the pintle, a center bolt depending from a member at the upper end of said pintle, and a nut for said bolt swiveled in one of the fixed hinge members, substantially as described.

4. In a hinge the combination with rela-

- tively fixed and movable hinge members, of a tubular pintle within said members, an actuating spring within said pintle operatively connected with said movable hinge member through an opening in the pintle, a bridge-block crossing the upper end of said pintle, a center bolt depending from said bridge-block, and a nut for said bolt swiveled in one of the fixed hinge members, substantially as described.
5. In a hinge the combination of upper and lower fixed hinge members, of an interposed movable hinge member, a tubular pintle within said members, an actuating spring within said pintle operatively connected at opposite ends with said movable hinge member through openings in said pintle, a bridge-block removably crossing the upper fixed hinge member and resting upon the upper end of said pintle, a center bolt depending from said bridge-block, and a nut for said bolt swiveled in the lower of said fixed hinge members, substantially as described.
6. In a hinge the combination with fixed and movable hinge members, of a tubular pintle within said members having a transverse slot intermediate of its ends, an actuating spring within said pintle operatively connected with said movable hinge member, a center bolt passing through the entire structure, and a locking lever having a cam surface adapted to operatively connect with said slot of said tubular pintle to lock it against rotation, substantially as described.
7. In a hinge the combination with fixed and movable hinge members, of a tubular pintle within said members, an actuating spring within said pintle operatively connected with said movable hinge member, an adjusting bolt passing through the entire structure, a pivotal locking lever independently supported with relation to said hinge members, and a dog actuated by said lever to engage a slot in said tubular pintle to retain the latter against rotation, substantially as described.
8. In a hinge the combination with fixed and movable hinge members, of a tubular pintle within said members having a transverse slot near its upper end, an actuating spring within said pintle operatively connected with said movable hinge member, an adjusting bolt passing through the entire structure, a locking lever, a cam carried by said lever, a vertically movable dog actuated by said cam, and teeth upon said dog projecting into said transverse slot adapted to interlock with the pintle aforesaid, substantially as described.
9. In a hinge the combination with fixed and movable hinge members, of an interposed actuating spring, a tubular pintle surrounding said spring having a transverse slot with a serrated edge, a dog adapted to engage the serrated edge of said transverse slot, a lever for throwing said dog into and out of engagement, and an adjusting bolt passing through the entire structure, substantially as described.
10. In a hinge the combination with a main channeled supporting plate, upper and lower fixed hinge members projecting horizontally from said plate, a movable hinge member interposed between the two aforesaid fixed members, a tubular pintle within said members, an actuating spring within said pintle operatively connected with said movable hinge member, an adjusting bolt passing through the entire structure, and a locking lever having a cam surface adapted to operatively connect with said pintle to lock it against rotation, substantially as described.
11. In a hinge the combination with relatively fixed and movable hinge members, a central bolt passing through said members, an adjusting nut upon said bolt protruding below said members, and an outer casing surrounding said fixed and movable members comprising overlapping sections the lowermost whereof is vertically movable and provided with a central aperture to permit passage of the said adjusting nut, substantially as described.
- In testimony whereof I affix my signature, in presence of two subscribing witnesses.
- JOHN A. FISCHER.
- Witnesses:
W. C. DUTTLINGER,
THOS. J. HALLY.