(No Model.)

W. D. BUCHANAN.

HINGE.

No. 580,448. Patented Apr. 13, 1897.

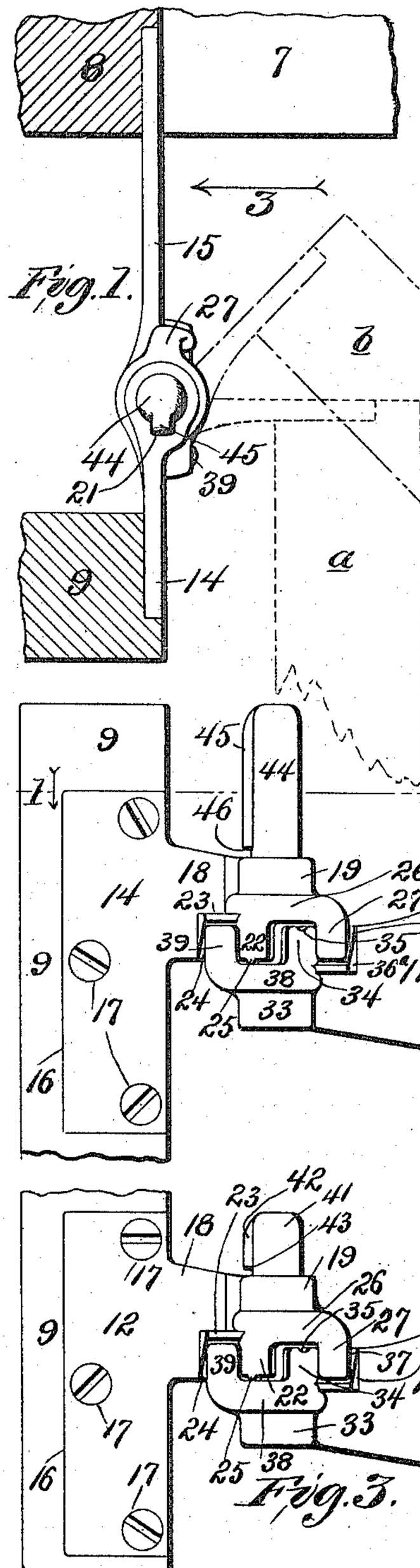

Fig. 1.

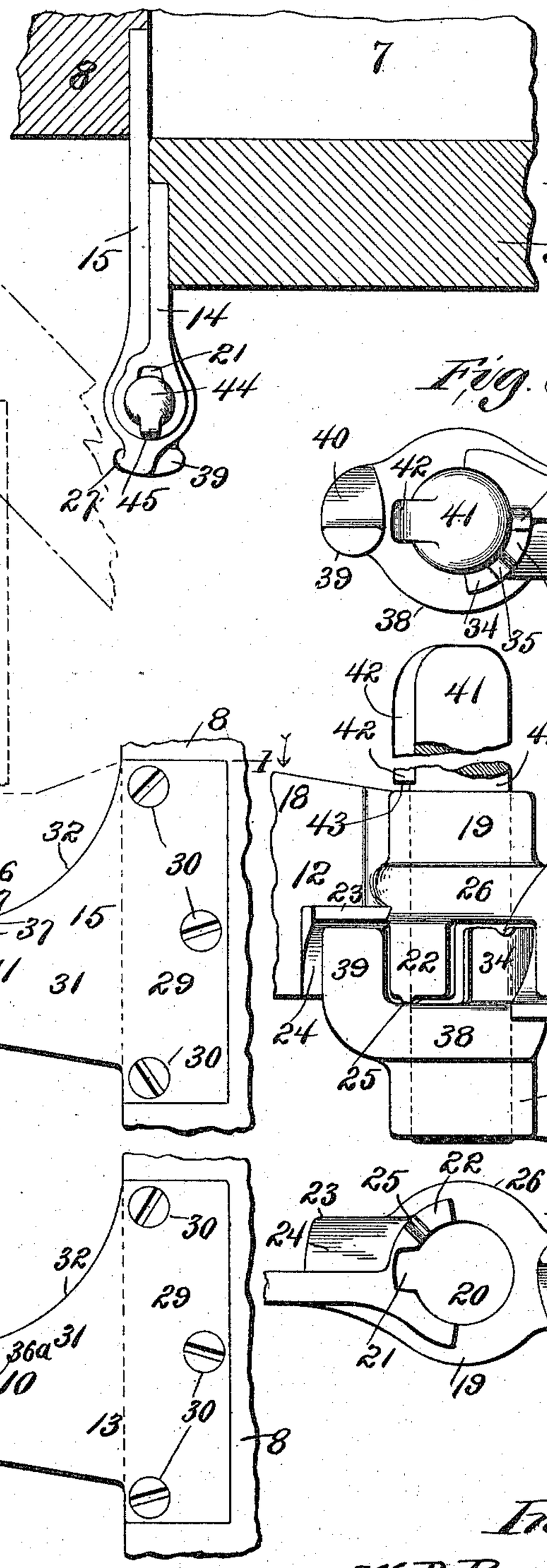

Fig. 2.

Fig. 5.

Fig. 4.

Fig. 3.

Fig. 6.

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UNITED STATES PATENT OFFICE.

WILLIAM D. BUCHANAN, OF ST. LOUIS, MISSOURI.

HINGE.

SPECIFICATION forming part of Letters Patent No. 580,448, dated April 13, 1897.

Application filed October 26, 1896. Serial No. 610,088. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM D. BUCHANAN, of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Hinges, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to hinges; and it consists in the novel construction, combination, and arrangement of parts hereinafter shown, described, and claimed.

Figure 1 is a horizontal sectional view through a door and the casing of a door, taken at a point above one of my improved hinges, thus showing a top plan view of the hinge in the position it occupies when the door is entirely open, parts being broken away to economize space and different positions of the door being shown in dotted lines. The line upon which the view is taken is indicated by 1 1 in Fig. 3 and looking in the direction indicated by the arrows. Fig. 2 is a view corresponding to Fig. 1 and showing the door closed. Fig. 3 is a side elevation of a pair of my improved hinges in the position they occupy when the door is open, as in Fig. 1, and looking in the direction indicated by the arrow 3 in Fig 1. Fig. 4 is an enlarged detail view of the parts composing the joint of the hinge, the other parts of the hinge being broken away to economize space. Fig. 5 is a top plan view of the lower portion of the hinge. Fig. 6 is a bottom plan view of the upper portion of the hinge.

My improved hinges are especially adapted to hanging window-blinds, screen-doors, storm-doors, &c. The hinges are preferably made in pairs, as shown in Fig. 3, the difference between the two hinges composing a pair being that one of the spindles is considerably longer than the other spindle.

Referring by numerals to the drawings, 7 indicates the window or door sill; 8, the frame or casing of the door or window; 9, the blind, screen, or door, and 10 and 11 represent a pair of my improved hinges.

My improved hinges are especially adapted for hanging a door or blind in position outside of the plane occupied by the casing, as shown in Fig. 2. In this construction the door or screen fits against the outer face of the frame and its edges are not well protected.

A pair of my improved hinges consists of the upper part 12 and the lower part 13, forming the lower hinge, and the upper part 14 and the lower part 15, forming the upper hinge.

The upper part 12 consists of a rectangular plate 16, having countersunk apertures, through which are inserted the screws 17 for attaching said plate to the door. Projecting from the edge of the upper half of the plate 16 is an arm 18, and upon the inner end of said arm 18 is formed a vertical cylindrical portion 19, which has a vertical circular opening 20 and a rectangular slot 21, communicating with said circular opening and both extending through its center. The cylindrical portion 19 extends downwardly from the upper edge of the arm 18 about two-thirds of the distance across said arm, and a segmental wall 22, which describes nearly a half-circle, extends from the lower end of said cylindrical portion 19 to the lower edge of said arm 18. A lug 23 is formed upon the inside of the arm 18 and joined to the segmental wall 22. The upper face of the lug 23 is substantially horizontal, while the lower face 24 of said lug is vertically inclined at an angle of about forty-five degrees relative to the arm 18 and horizontally parallel relative to said arm. Formed upon the lower edge of the segmental wall 22 is a V-shaped lug 25, projecting downwardly at a point near the inner end of said wall. A bead 26 is formed around the outer face and lower edge of the cylindrical portion 19, and a lug 27 projects from said bead at the side of the cylindrical portion 19 opposite the arm 18 backwardly and downwardly to a point on a plane with the lower edge of the segmental wall 22. The outer face 28 of said lug 27 is inclined at an angle of about forty-five degrees. The faces 24 and 28 are formed upon substantially the same plane and are arranged radially and equidistant relative to the axis of the hinge.

The portion 13 consists of the rectangular plate 29, having countersunk openings through which the screws 30 are inserted to attach said plate to the frame of the door or window. An arm 31 is formed upon the front

edge of the plate 29, with its free end substantially in line with the lower half of said plate. The upper edge 32 of the arm 31 is substantially a segment of a circle and terminates at the upper end of the plate 29. Formed upon the free end of the arm 31 is a vertical cylindrical portion 33, which extends from the lower edge of said arm upwardly about two-thirds of the way to the upper edge of said arm, and the segmental wall 34 extends upwardly from the upper end of said cylindrical portion 33 to the upper edge of said arm 31, and said wall 34 is substantially a counterpart of the wall 22. V-shaped notches 35 and 36 are formed in the upper edge of said wall 34 to receive the V-shaped lugs 25, carried by the wall 22. A lug 36^a is formed upon the inner face of the upper edge of the free end of the arm 31 and joined to the wall 34. The lower face of the lug 36^a is substantially horizontal, while the upper face 37 of said lug is vertically inclined at an angle of about forty-five degrees relative to the arm 31 and horizontally parallel to said arm. The lug 37 is substantially the counterpart of the lug 23 in an inverted position, and the inclined face 28 engages the inclined face 37. A bead 38 is formed around the upper end of the cylindrical portion 33 and is the counterpart of the bead 26. A lug 39 projects from said bead at the side opposite the arm 31 outwardly and upwardly to a plane on a line with the upper edge of the wall 34 and has the face 40 inclined at an angle of about forty-five degrees, which face engages the inclined face 24. The lug 39 is a counterpart of the lug 27. Extending upwardly from the axial center of the cylindrical portion 33 is a spindle 41. The spindle 41 may be formed integral with the cylindrical portion 33, or it may be set in the vertical opening formed through the center of said cylindrical portion 33, as desired.

Upon the upper end of the spindle 41 and upon the side thereof opposite the arm 31 is a vertical rib or lug 42, the sides of which are parallel and designed to pass through the rectangular recess 21. The lower end 43 of the lug 42 is substantially horizontal and is at a point relative to said spindle 41 which will bring it above the upper end of the cylindrical portion 19 when the spindle 41 has been inserted through the circular opening 20, as shown in Fig. 4. When the walls 22 and 34 have their bearing-faces in opposition to each other—in other words, when the lower edge of the wall 22 is resting upon the upper edge of the wall 34—the end 43 of the lug 42 is directly above and close to the upper surface of the cylindrical portion 19, as required to prevent the cylindrical portion 19 from sliding upwardly upon the pin 41. The lug 42 is designed to prevent the two parts of the hinge from being separated except when said lug is in vertical alinement with the recess 21, and this occurs only when the door or blind is wide open, as shown in Fig. 1, thus bringing the plates 12 and 13 in a line.

The portion 14 of the upper hinge corresponds to the portion 12 of the lower hinge in every essential.

The portion 15 of the upper hinge corresponds to the portion 13 of the lower hinge in every essential except that the spindle 44 is considerably longer than the spindle 41 and the lug 45, formed on the upper end of said spindle, is considerably longer than the lug 42 and long enough to bring the lower end 46 of said lug to a point immediately above the upper end of the cylindrical portion 19 of the portion 14.

The object in having the pin of the upper hinge longer than the pin of the lower hinge is to avoid the necessity of inserting said pins into the openings 20 simultaneously. The long pin is first placed in the opening 20 of the upper portion 14, and this part of the hinge needs no further attention. Then the shorter pin is guided into the opening 20 of the lower portion 12, after which the door or blind will settle down to its normal position. The door or blind can only be removed by separating the hinges when said door or blind is wide open and in a position parallel with the frame, as shown in Fig. 1. When the door or blind is closed and locked, it cannot be removed by separating the hinges except by breaking the hinge, and the heads of the screws being out of reach said hinges cannot be removed from either the door or the frame while said door is in its closed position.

When the door is wide open, as shown in Figs. 1, 3, and 4, the segmental walls 22 and 34 are substantially in the same horizontal plane. When the door or blind starts to close, the inclined faces 28 and 36 engage each other and the inclined faces 24 and 40 engage each other and the faces upon the portions 12 and 14 slide upwardly upon the faces upon the portions 13 and 15, thus raising the door until the lower edges of the segmental walls 22 rest upon the upper edges of the segmental walls 34. Then as the door swings to the proper position, as indicated by the dotted lines *a* in the drawings, the V-shaped lug 25 will drop into the recess 35, and the door will stand in that position unless considerable force is exerted to move it one way or the other. In like manner the door may be turned to the position indicated by the dotted lines *b* in Fig. 1, when the V-shaped lug 25 will drop into the recess 36, and the door will stand in that position.

An additional number of recesses 35 and 36 may be employed, and by this means the door may be set at any desired position, and no additional door-stop is required to hold it in that desired position, thus preventing the annoyance of having the blind or screen or door swing back and forth in the way. The segmental wall 22, being located as it is very near to (in fact, in contact with) the spindle

and passing around the said spindle, forms a large bearing and guide on opposite sides thereof and thereby serves to guide the spindle and prevent lateral movement of the same during operation, and said segmental wall also greatly strengthens the hinge at a weak point.

Hinges constructed in accordance with the principles of my invention are very simple and inexpensive and at the same time very efficient and satisfactory for the purposes described.

I claim—

A hinge comprising in its construction the plate 16, the arm 18 formed integral with the upper half of said plate 16, the vertical cylindrical portion 19 formed integral with said arm and having a vertical opening to receive the spindle, the segmental wall 22, describing nearly half a circle, projecting downwardly from said cylindrical portion, the lug 23 formed upon the side of the arm 18 and joined to said segmental wall 22, the lug 25 projecting downwardly from near the end of said wall 22, the lug 27 projecting from said cylindrical portion 19 to a plane substantially in alinement with the lower edge of the segmental wall 22, the plate 29, the arm 31 formed integral with the edge of said plate and substantially in a horizontal line with the lower half of said plate, said arm 31 being considerably longer than said arm 18, the vertical cylindrical portion 33 formed upon the free end of said arm 31, the segmental wall 34 extending upwardly from said cylindrical portion and having the V-shaped notches 35 and 36 formed in its upper edge to receive the lug 25, the lug 36ª formed upon the side of the arm 31 and joined to the wall 34, the lug 39 projecting from the cylindrical portion 33 upwardly to a plane substantially in line with the upper edge of the segmental wall 34, and the spindle projecting upwardly from the axial center of the cylindrical portion 33 and operating in the vertical opening in said cylindrical portion 19, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM D. BUCHANAN.

Witnesses:

EDWARD E. LONGAN,

MAUD GRIFFIN.