July 1, 1930. H. T. WALTON 1,768,810

FRICTION HINGE

Filed June 22, 1928

FIG. I.

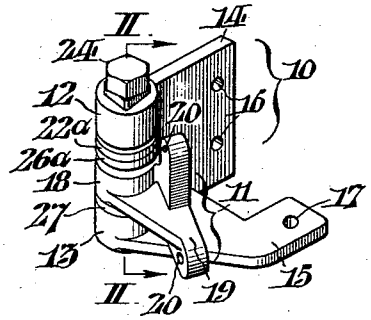


FIG. III.

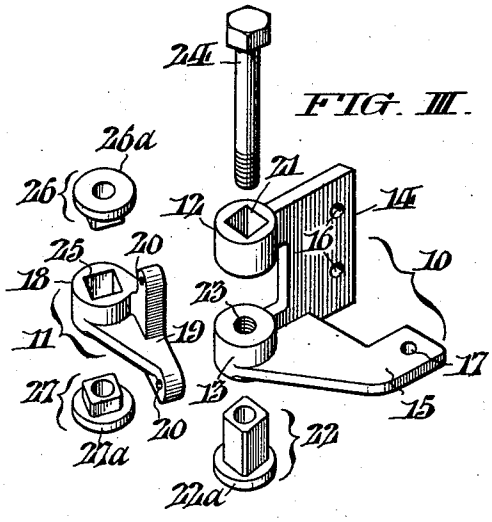


FIG. II.

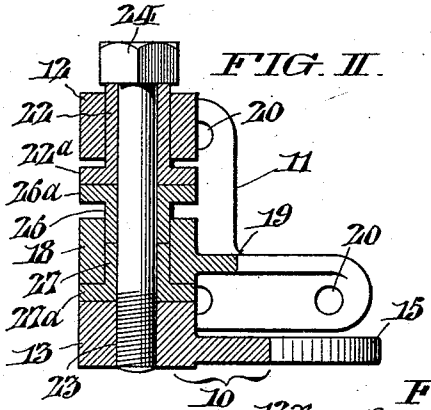


FIG. IV.

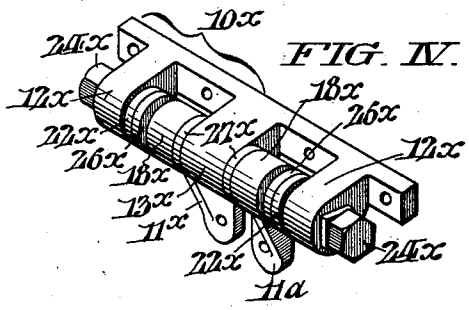
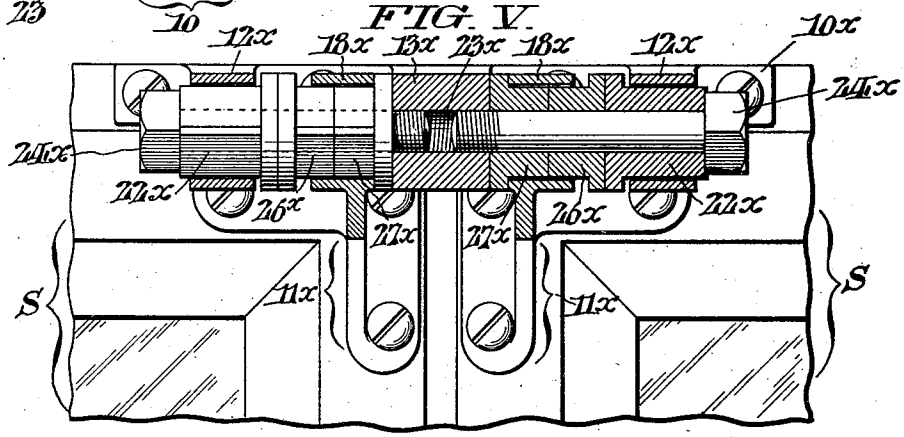


FIG. V.



WITNESSES

Thomas W. Kerr, Jr.

John A. Weidler

INVENTOR:

Howard T. Walton,

BY Fraser & Paul

ATTORNEYS.

Patented July 1, 1930 1,768,810

UNITED STATES PATENT OFFICE

HOWARD T. WALTON, OF COLLINGSWOOD, NEW JERSEY, ASSIGNOR TO DAVID LUPTON'S SONS COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA

FRICTION HINGE

Application filed June 22, 1928. Serial No. 287,448.

This invention relates to friction hinges useful with doors, casement windows, etc., to hold such closures against displacement under wind pressure when moved to various positions of opening for the purpose of ventilation.

In connection with hinges of the character referred to I aim to enable maintenance of a constant degree of frictional resistivity throughout the range of hinge movement without inducing strain on the interpivoted components of the hinge, or of causing, as wear occurs, disalignment between the respective parts of the door or window structure to which the hinge components are fastened.

My invention is further directed toward securing the foregoing advantages in a hinge structure which is simple in construction, and involves a minimum number of parts; that is very compact, sturdy and free from liability to easy derangement; which is conducive to manufacture at comparatively small cost; and which can also be adjusted without entailing the use of special tools for the purpose.

How the foregoing and other advantages may be readily secured in practice will be manifest from the following description when considered with the accompanying drawings, wherein Fig. I is a perspective view of a hinge conveniently embodying my invention in a form suitable for use with casement doors or windows.

Fig. II is an axial section through the pivot of the hinge, or taken as indicated by the arrows II—II in Fig. I.

Fig. III is an exploded view showing the various parts of the hinge, of Figs. I and II, in perspective.

Fig. IV is a perspective view of a double hinge embodying my invention; and,

Fig. V is a fragmentary illustration of a multi-sash window structure illustrating the use of the hinge of Fig. IV, the latter being shown in axial section.

With reference first to Figs. I–III, the hinge there delineated comprises the interpivoted components 10, 11 whereof the first may be regarded as the fixed member or that member intended to be secured to the window or door jamb, and the second the movable member which is to carry the door or window sash. The fixed hinge component 10 embodies two spaced ears 12, 13 from which project wings 14, 15 that occupy planes at right angles, said wings being pierced as at 16, 17, respectively for passage of securing means such as screws or rivets.

The movable hinge component 11 has but a single ear 18, which, in the assembled structure, occupies the interval between the ears 12, 13 of the fixed component 10 with provision of a definite amount of end clearance above and below. Integrally formed with the ear 18 is an angular attachment wing 19, which, like the wings 14, 15 of the component 10, is pierced as at 20, for passage of similar securing means.

As shown in Fig. III, the upper ear 12 of the component 10 has an axial polygonal opening 21—in the present instance of square configuration—to receive and hold against independent rotation a correspondingly configured bushing 22 with a circumferential flange projection 22^a affording an extended annular friction bearing shoulder. The bottom ear 13 of the hinge component 10 is axially drilled and tapped as at 23 to take the lower end of a headed screw bolt 24 that serves as the hinge pintle and also in another capacity later on explained. Still referring to Fig. III it will be noted that the ear 18 of the moving hinge component 11, like the ear 12 of the companion component, has a polygonal opening 25 to receive opposite end bushings 26, 27 respectively with circumferential shoulder projections 26^a, 27^a.

In assembling the hinge parts, the bushing 22 is introduced upward into the ear 12 of the component 10, and the bushings 26, 27 placed into opposite ends of the ear 18 of the moving hinge component 11. With these preliminary steps accomplished, the ear 18 of the component 11 is introduced between the ears 12, 13 of the fixed component 10. In this connection it is to be noted that the bushings 26, 27 together have considerable end projection beyond the ear 18, and that the same is true of the bushing 22 with regard to the ear 12. Upon axial alignment and endwise abutment of the several bushings 22,

26 and 27, the bolt 24 is inserted downward through them and screwed into the ear 13 of the fixed component 10. As the bolt 24 is tightened, it will be seen that the group of aligned bushings 22, 26 and 27, will be placed under compression with consequent increase of friction between the extended opposing annular shoulder surfaces of the bushings 22 and 26, provided by the circumferential projections 22^a, 26^a, as well as between the flange 27^a of the bushing 27 and the contiguous top surface of the lower ear 13, of the hinge member 10. It is to be particularly noted however, that absolutely no strain is induced in or between the hinge components 10, 11 incidental to adjustment of the friction since the bushings 22, 26, 27, by virtue of their end projection, are independent of the ears 12, 18 as regards axial movement, and the hinge member 11 free to shift up and down on the bushings 26, 27 engaged by the ear 18. It therefore follows also that the alignment of the parts of the door or window structure with which the hinge is used, is not disturbed incident to taking up upon the friction members 22^a, 26^a and 27^a, as wear takes place. In practice, the bushings 22, 26, 27 are made from different metals having different coefficients of friction and which are free against corrosive action.

The double hinge of Fig. IV comprises a fixed component 10^x and moving right and left components 11^x, 11^x adapted to serve two adjacent sashes shown at S, S in Fig. V. The fixed component 10^x affords three spaced ears 12^x, 12^x and 13^x. As shown in Fig. V, the ears 12^x have polygonal apertures 21^x to take correspondingly shaped non-rotative friction bushings 22^x; whereas the center ear 13^x is tapped as at 23^x to take the screw bolts 24^x, 24^x for opposite end sections of the double hinge. The bosses 18^x of the movable members 11^x are equipped with polygonal bushings 26^x, 27^x to coact with the bushings 22^x. The modification of Figs. IV and V is therefore identical with the embodiment of Fig. I except that here, two separate adjustments are provided for to suit the double character of the hinge structure.

Having thus described my invention, I claim:

1. A friction hinge of the type described comprising interpivoted components, polygonal section bushings fitted in the respective hinge components and axially aligned in abutting relation in the hinge pivot, said bushings extended at their ends beyond the respective components to afford opposing frictional bearing surfaces, and a headed screw taking into one of the hinge components whereby the group of abutting bushings may be compressed to different extents to vary the frictional resistivity of the hinge without inducing strain in or between the hinge components.

2. A friction hinge of the type described comprising components, each with a number of pivoted ears that interengage with provision of clearance between the ends, polygonal-section abutting bushings frictionally-fitting in said ears with extension therebeyond at the opposite ends and having circumferentially enlarged end flanges occupying the intervals between ears to afford opposing frictional bearing surfaces, and means whereby the group of abutting bushings may be compressed to different extents to vary the frictional resistivity of the hinge.

3. A friction hinge of the type described comprising a fixable component, said component having two spaced pivot ears, one of which has an axial polygonal opening and the other an axially screw-threaded opening, a correspondingly configured bushing fitting the polygonally apertured ear and having a circumferential flange affording an extended annular friction bearing shoulder with projection beyond said ear at opposite ends, a complemental movable carrying component having a polygonally-apertured ear with opposed correspondingly-configured friction bushings having end projections to contact on the one hand with the bushing first mentioned, and on the other hand with the screw-threaded ear of the fixable hinge component, and a headed adjusting screw passing axially through the aligned bushings and taking into the screw-threaded ear aforesaid whereby the group of abutting bushings may be compressed to different extents in varying the frictional resistivity of the hinge without imposition of strain in or between the two hinge components.

In testimony whereof, I have hereunto signed my name at Philadelphia, Pennsylvania, this 12th day of June, 1928.

HOWARD T. WALTON.