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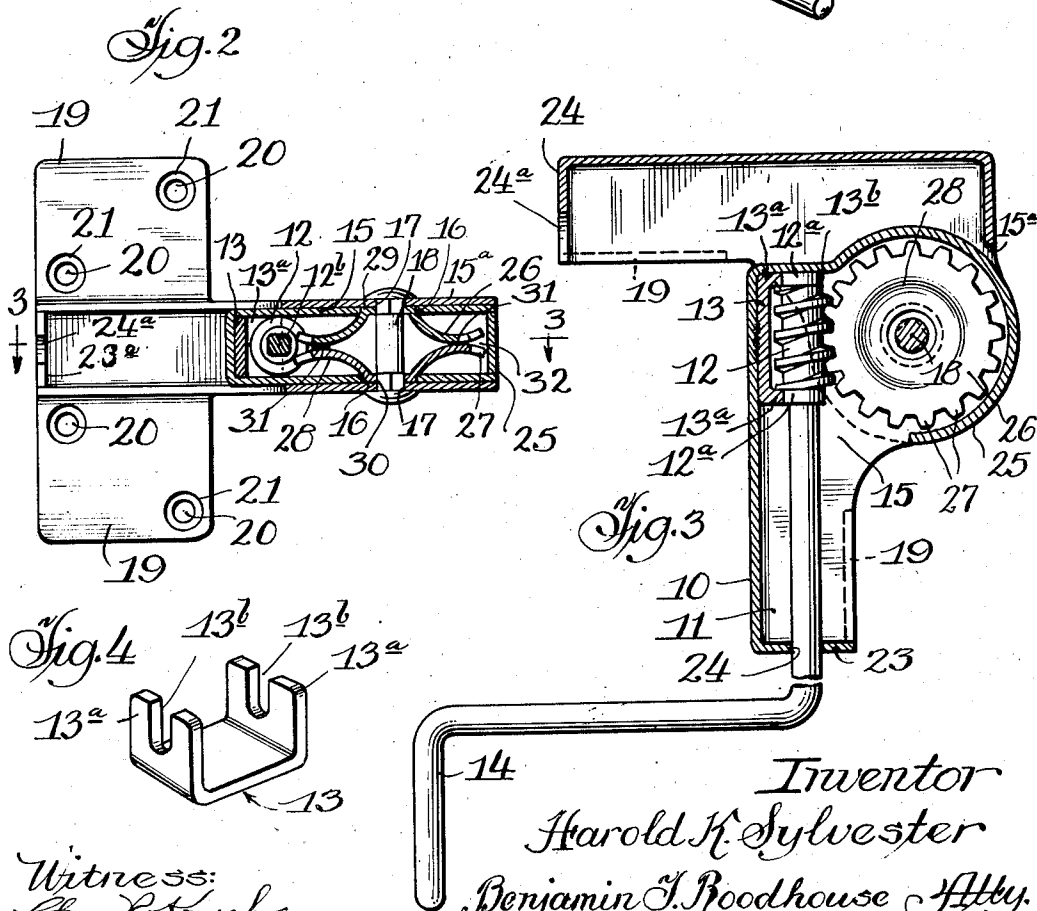
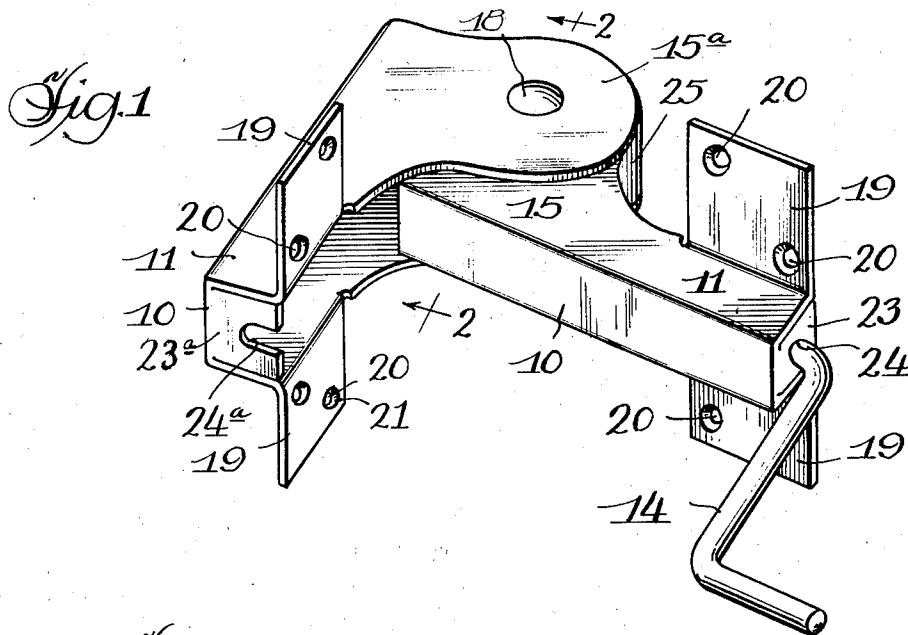
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2,190,741

HINGE AND OPERATING MEANS THEREFOR

Filed July 28, 1938

2 Sheets-Sheet 1



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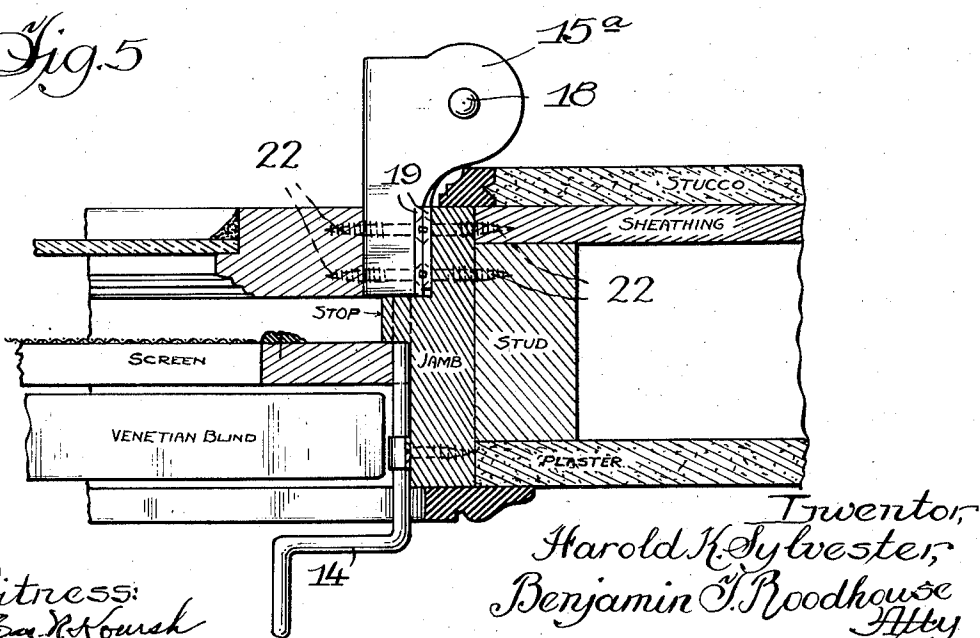
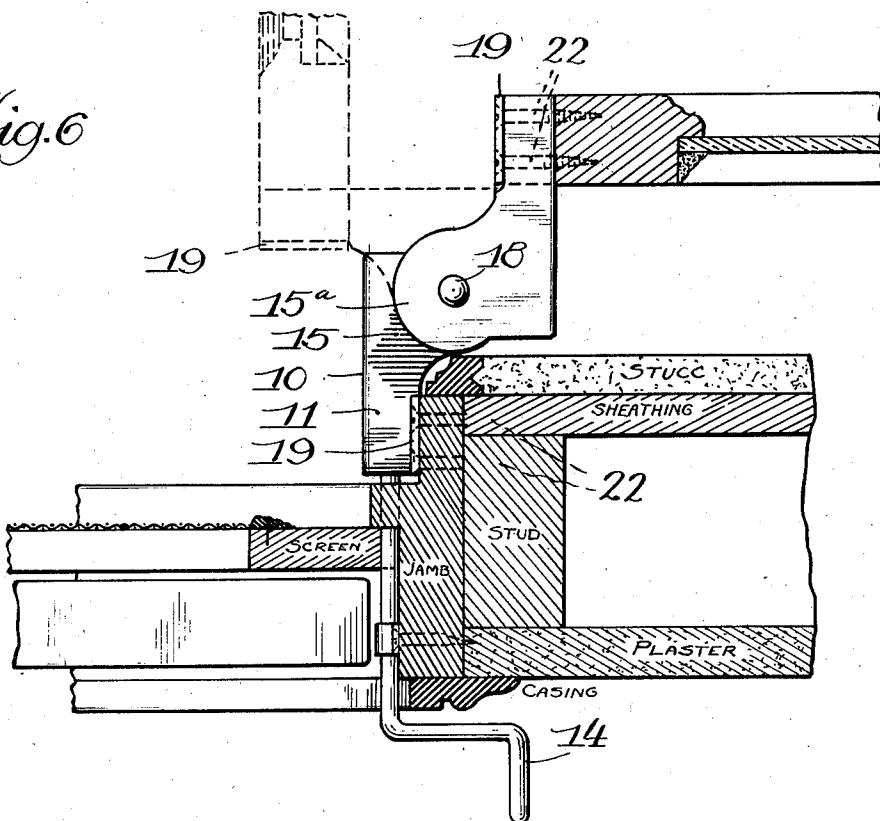
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HINGE AND OPERATING MEANS THEREFOR

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UNITED STATES PATENT OFFICE

2,190,741

HINGE AND OPERATING MEANS THEREFOR

Harold K. Sylvester, Los Angeles, Calif.

Application July 28, 1938, Serial No. 221,768

5 Claims. (Cl. 268—119)

My present invention relates to the provision of hinges and the operating means therefor, for doors, window sash, shutters or blinds and the like.

My general objects have been to simplify such structures and thereby permit an economy in the manufacture thereof and also to improve such structures with reference to dependability and functioning. As collateral objects, I desired to produce a structure which will serve for both right and left opening sash etc. without changes and which will be uniform in appearance. That is, I desire to provide a structure in which the control elements are installed or omitted without changing the appearance or the remaining structure of the hinge. As further objects I desired to produce a structure which can be largely made by stamping operations, and I desired to produce the worm-gear or worm-wheel by stamping operations so that the only remaining portion of my structure which requires machining is the worm.

I have obtained the foregoing objects by means of the structure illustrated in the accompanying drawings, in which—

Fig. 1 is a perspective of a hinge embodying my present invention.

Fig. 2 is a transverse section running centrally through the hinge pintle on line 2—2 of Fig. 1.

Fig. 3 is a longitudinal section on line 3—3 of Fig. 2.

Fig. 4 is a perspective detail of the cradle for the worm.

Fig. 5 is a detail partially in section, showing the window sash in closed position.

Fig. 6 is a view similar to Fig. 5 showing the window sash open 180 degrees in full lines and 90 degrees in dotted lines.

Similar reference characters designate similar parts in the respective views.

The structure is largely formed of a suitable gauge or thickness and quality of a desired material, such as iron, mild steel or a stainless or rustless metal composition as the customer may desire and be willing to pay for.

It was my object to provide a hinge, the leaves or wings whereof constitute a casing within which the operating elements, comprising a worm and a worm-wheel or worm-gear, could be mounted. In order to do this the blanks of sheet metal of a proper gauge, are cut so as to provide a central portion 10, of a rectangular, longitudinally elongated form, from the longitudinal edges of which extend wings 11. The wings 11 are sufficiently wide to provide space

for receiving and containing the worm 12 and its mounting or cradle 13 and a detachable shaft of a crank 14, by means of which the worm is rotated; and the outer portion of the wings 11 are further extended in an ear like form to enclose the worm gear. It will be understood that the wings 11 are bent at right angles with the central portion 10 of the blank so as to lie parallel with each other. For greater clearness I have marked the portions of the wings which lie adjacent the central portion and constitute, with the central portion, the casing for the worm 12 and its cradle 13 and the shaft of the crank 14, with reference character 15 and the ear shaped portion of the wings 15a. The two members of the hinge are of the outline and form above described but one of these members is sufficiently larger than the other to constitute the outer and inner members of the hinge, one of which fits into and registers with the other, part for part. The centers of the ear like portions of the inner member are perforated at 16 to provide a journal or bearing for the central portion of the worm-wheel or worm-gear, and the centers of the ear like portions of the outer member are provided with angular apertures 17 to receive the square shank of a rivet 18 for fixedly securing a wormwheel or worm-gear to said outer hinge member.

The edges of the wings 11 adjacent their inner ends, are extended to provide rectangular plates 19, which are bent outwardly from the wings 11 and are perforated at 20 and countersunk at 21 for the passage of screws 22 by means of which they are secured either to the jamb of the window casing or the vertical side rail of the sash or blind. The inner hinge member is attached to the jamb of the window casing and the countersinking is, therefore, on the same side from which the central portion 10 and wings 11 extend. The outer hinge member is secured to the side rail of the sash or blind and the countersinking 21 of the plates 19 extending from the outer hinge member are upon the sides opposite the central portion 10 and the wing portions 11.

The inner end of the central portion, 10, of the inner hinge member, is extended and bent at right angles, as at 23, and perforated as at 24, to form a closure for the inner end of the shaft and worm housing and a guide for the shaft of the crank 14. The inner end of the central portion 10 of the outer hinge member is extended and bent at right angles at 23a and the outer edge thereof is slotted at 24a to register with the perforation 24 in the extension 23

when the outer casing closes upon the inner hinge member. A strip of metal 25 is secured, by any desired means, between the edges of the ear shaped portions 15a of the wings of the inner hinge member so as to more completely enclose the operating elements within the inner hinge member.

The mounting or cradle 13 for the worm 12 consists of a strip of metal, the ends whereof are bent to extend parallel with each other in the same direction, as at 13a, and the outer edges of the ends 13a are slotted, as at 13b, to provide journals for the projecting ends 12a of the hub of the worm 12. The hub of the worm 12 is provided with an angular sectioned passage way 12b to receive the similarly angled end of the shaft of the crank 14. The base of the worm mounting or cradle 13 is secured, in any desired manner, as by spot welding or soldering or brazing, to the inner face of the central portion of the inner hinge member, 10, opposite the perforations 16.

The special worm gear which I have provided for cooperating with the worm, heretofore described, comprises a pair of discs 26 which may be cut out and formed by stamping operations. Besides being provided on their peripheral edges with teeth 27 to cooperate with the worm, they are centrally curved, as at 28, and the central portion of the curved portion is provided with a shoulder 29 to cooperate with the perforation 16 to form a journal for the worm-gear. Within the shoulders 29, the discs 26 are provided with square perforations 30 to receive the square shank of the rivet 18 which fixedly secures the worm-gear to the outer hinge member. The curved portions 28 of the discs 26 terminate within the peripheries of said discs, at which place 31, the discs are spot welded, or otherwise secured together, and the portions of the discs between the location of the teeth and the place where they are spot welded, or otherwise secured together, are spread, as at 32, so that the teeth in the respective discs straddle the curvature of the worm 12. This secures two results. First, the worm is held in its journal slots 13b; and, second, by rotating one disc with respect to the other before the discs are secured together, the desired accuracy of fit between the worm and the worm-gear may be secured, which fit has heretofore required careful machining in the making of the worm-gear.

It will be seen from the foregoing description, taken in connection with the drawings, that the inner end of the inner hinge member is secured to the jamb of the window or door frame and that the rotation of the worm, which is mounted in the inner hinge member, rotates the worm-gear, which is journaled in the inner hinge member and fixedly secured to the outer hinge member, thereby rotating the inner end of the outer hinge member which is secured to the side rail of the door or sash. It will be further seen that the turning of a hinge up side down, will render it suitable for either right or left swinging doors or sashes; and it will be also seen that the omission of the worm and worm-gear from a casing will leave a complete hinge in all respects similar in action and appearance for association with the hinges provided with the worm and worm-gear by means of which the door or sash may be completely opened and

closed or adjusted in any intermediate position.

It will be particularly noted by reference to Figs. 5 and 6, that the sash or blind is carried from a closed position within the outer line of the building wall to a completely open position outside of the outer line of the building wall and parallel therewith.

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

1. A hinge, comprising a pair of perforated straps for securing respectively to the jamb of a window frame and the side rail of a sash, said straps being formed at their central portions into channels extending laterally therefrom, the parallel flanges of said channels being extended, said channeled members being proportioned to register and fit together, part for part, a worm journaled in the channel of the inner of said members and a worm-gear, cooperating with said worm, journaled in the inner of said members and fixedly secured to the outer of said members.

2. A hinge comprising a pair of perforated plates for securing respectively to the jamb of a window or door frame and the side rail of a sash or door, said plates being formed at their central portions into channels extending laterally from said plates, the parallel flanges of said channels being further extended to provide ears at their remote ends, said plates being proportioned to register and one of said channels being proportioned to enter the other of said channels, a worm journaled in the inner of said channels and a worm-gear cooperating with said worm journaled between the extended ears of the inner of said channels and fixedly secured to the ears of the outer of said channels.

3. A hinge comprising a pair of perforated plates for securing respectively to the jamb of a window frame and the side rail of a sash, said plates having channels laterally extending therefrom, the remote portion of the parallel flanges of said channels being extended to provide ears, said channels being proportioned one to enter the other, a worm journaled in the inner of said channels and a worm-gear, cooperating with said worm, journaled between the inner of said channels and fixedly secured to the ears of the outer of said channels.

4. A hinge, comprising butt-plates having extending laterally therefrom channeled members, one of which is adapted to receive the other, a worm mounted in the inner of said members, and a worm-gear, cooperating with said worm, journaled between the walls of said inner member and fixedly secured between the overlaying and underlaying walls of said outer member.

5. A hinge, comprising butt-plates having extending laterally therefrom channeled members, one of which is adapted to receive the other, a worm, mounted in the inner of said members, and a worm-gear, cooperating with said worm, journaled between the walls of said member and fixedly secured between the overlaying and underlaying walls of said outer member, said worm-gear comprising a pair of discs having teeth cut upon their respective peripheries, the teeth bearing portions being spread to straddle the cooperating worm.

HAROLD K. SYLVESTER.