

L. B. SMYSER.
TRANSOM OPERATOR.
APPLICATION FILED APR. 21, 1913.

1,065,181.

Patented June 17, 1913.

2 SHEETS-SHEET 1.

Fig. 1.

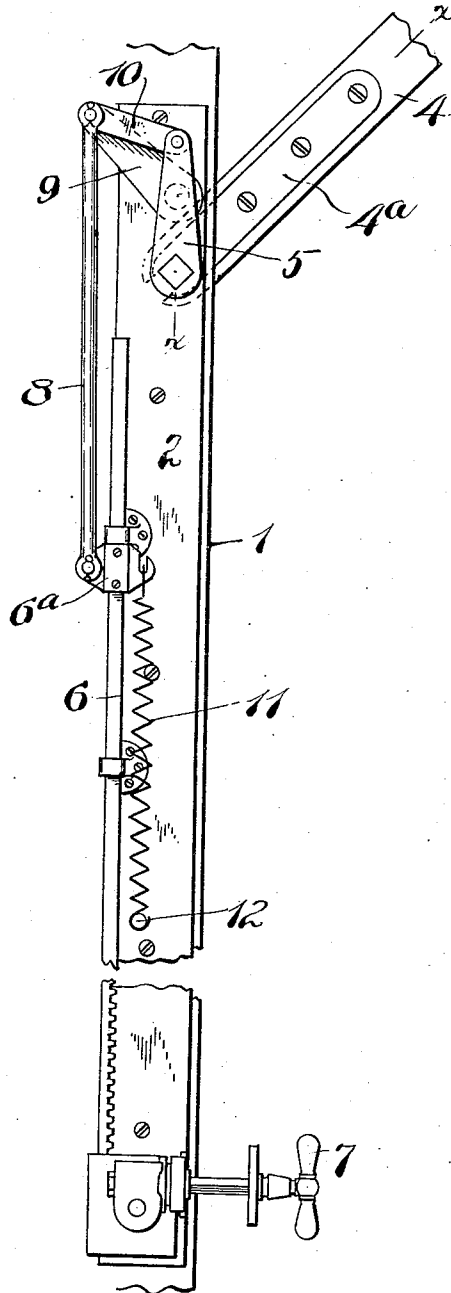
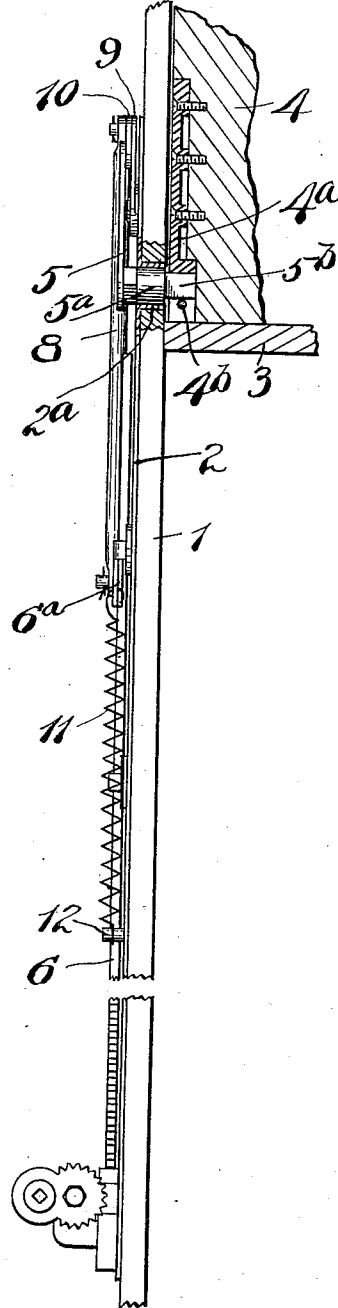


Fig. 2.



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2 SHEETS-SHEET 2.

Fig. 3.

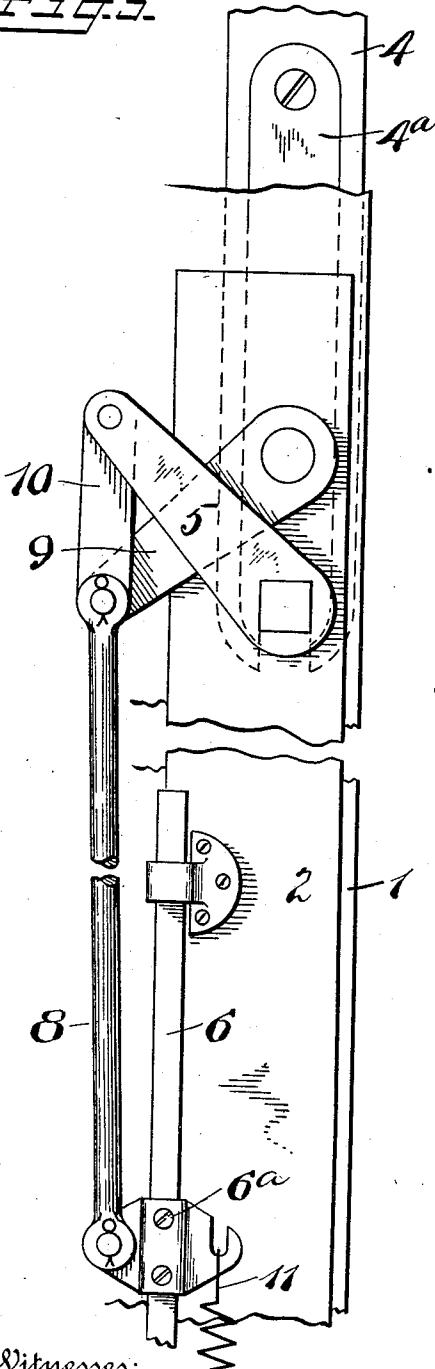


Fig. 4.

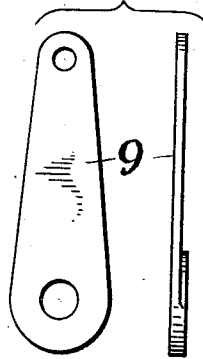


Fig. 5.

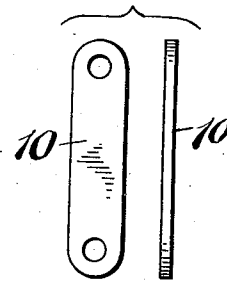


Fig. 6.

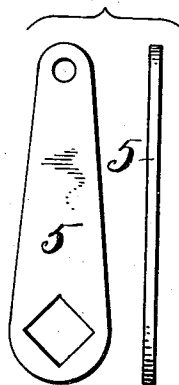
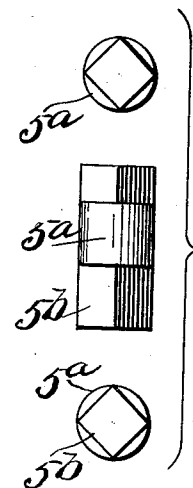


Fig. 7.



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TRANSOM-OPERATOR.

1,065,181.

Specification of Letters Patent.

Patented June 17, 1913.

Application filed April 21, 1913. Serial No. 762,482.

To all whom it may concern:

Be it known that I, LOUIS B. SMYSER, a citizen of the United States, residing at New Britain, Hartford county, State of Connecticut, have invented certain new and useful Improvements in Transom-Operators, of which the following is a full, clear, and exact description.

My invention relates to an improved operating mechanism for transoms and other swinging closures.

I aim to provide a simple and effective means for positively controlling the position of the closure whereby the same may be tightly closed or held open at any desired angle.

Broadly speaking, the main object of the invention comprises a novel arrangement of compound levers and links so arranged as to secure the greatest power at the time of greatest load, said compound leverage being such as to avoid sliding connections, cams and like devices, thereby practically eliminating friction.

I have shown my invention as applied to a transom controller of the well known concealed type, in which the various parts are hidden within the door-casing, the operating handle alone being exposed at the face of the door-casing at a convenient height to permit the operator to easily grasp and operate the same. I have associated the various parts as a unit so that they may be conveniently and properly assembled at the factory and shipped to their destination and there applied without danger of disturbing the adjustment and proper relation of the parts.

In the drawings, Figure 1 is a side elevation on a reduced scale of my invention as it appears in place showing the transom in the open position. Fig. 2 is a front edge view, the transom itself being shown in section on the plane of the line $x-x$. Fig. 3 is a relatively enlarged view of certain of the parts such as shown in Fig. 1, said parts being shifted to the position where the transom is closed. Figs. 4, 5, 6 and 7 are detail views.

1 represents one side of the door-casing or frame.

2 represents a plate which constitutes the main frame or unit mounting for the various parts. This plate 2 is arranged to be secured

to the inside of the door-casing by suitable screws or other appropriate fastenings.

3 represents the lintel bar of the door-casing above which is located a transom 4. The transom 4 may be of the ordinary construction and is provided with a suitable pivot bearing which passes through the side 1 of the door frame and which has at its outer end the usual crank 5. It is immaterial where the transom is pivoted, that is to say, whether it is at the lower or upper edge or at an intermediate point. In the drawings, I have shown the pivotal point for the transom near the lower edge which is the preferable location, and it should be understood, of course, that the opposite end of the transom (not shown) is provided with an appropriate concentric pivotal support, whereby the transom will be supported at each end.

The operating means comprises in its preferred form a vertically sliding bar 6 mounted in suitable guides and operated in any suitable manner by a handle 7. The handle 7 is preferably geared to the sliding bar 6, which may have a rack thereon.

8 is a link pivotally connected at its lower end to an offset 6^a, preferably adjustable on the bar 6. The upper end of the link 8 is pivotally connected to a pivoted lever 9 at a point adjacent its free end. The lever 9 is pivoted to the plate 2 adjacent one end and the pivotal axis is out of line with the pivotal axis of the crank 5, the lever 9 extending obliquely relative to said crank. In the drawings, which show the preferred form, the pivotal axis of lever 9 is located somewhat above the axis of the crank 5.

10 is a link which is pivotally connected to the crank 5 and also to the lever 9. The link 10 is connected with said crank at a greater distance from its pivotal center than the pivot for lever 9 and hence always stands at an angle to crank 5 and lever 9. By pivoting the lever 9 adjacent and on a different center from that of crank 5 and arranging these parts with the crank obliquely relative to each other, I am enabled to compound the leverage through the connecting link 10. The lever 9 and crank 5 always maintain an angular arrangement, although the relative angle changes with the movement of the lever. The oblique arrangement of these parts enables me to se-

cure a most effective leverage against the crank arm 5 through link 10 when the latter stands uprightly (Fig. 1) with the transom open, which is the position that imposes the greatest load on the parts and requires the greatest power on the closing movement. In the preferred construction, the crank 5 has a shaft extension 5^a, which has a bearing in the plate 2, which latter may be offset as at 2^a to furnish a comparatively broad bearing support or bushing for the shaft 5^a. The shaft extension 5^a preferably has a squared or angular end 5^b, which projects into the transom 4, a suitable keeper plate 4^a being fastened to the edge of the transom and having an aperture therein of proper shape to fit the squared or angular part 5^b so that the transom will be locked thereto against independent rotation—hence when the crank 5 is turned, the transom 4 is likewise turned. The aperture in the keeper plate 4^a may be a slot which is open at the lower side to permit the transom to be easily put on and taken off by simply sliding the same into place where it may be retained either by gravity or by a pin or other suitable fastening 4^b.

11 is a compensating spring which is by preference provided, one end being hooked to the offset 6^a and the other end being secured to a suitable anchorage 12 on the frame plate 2, the spring assisting to maintain the transom closed and also assisting the operator proportionately with the load.

It should be understood that the various proportions and arrangements of parts may be modified, and that the particular points of connection for the various levers and links may be modified from that shown, so long as the said parts coöperate to secure the results characteristic of the arrangement herein shown and described.

For a detailed description of an appropriate gear connection between the handle 7 and the rod 6, I may refer to corresponding parts shown in my copending application Serial No. 753,953 filed March 13th, 1913. It should be understood that the crank 5 may be connected directly to the transom 4, as shown herein, or as shown in the J. M. Maddox Patent No. 439,964 of November 4, 1890, or it may be connected indirectly to a sliding connection such as shown in my copending application aforesaid, or as set forth in G. C. Weil Patent No. 802,063, of October 17, 1905. It will be understood that I deem these various means of connecting the crank 5 to the transom as equivalent, and that the present improvement resides in the system of compound levers by which the crank 5 may be turned without the aid of cams or sliding connections between said parts, and whereby substantial friction is avoided so that the parts will move with

the greatest ease and positiveness. In operation it will be seen that the greatest leverage to the movement of the transom 4 is provided when the transom is open, so that the weight of the transom rests on the pivotal support, for in that position a powerful compound toggle lever action is effected between the axis of the crank 5 and the free end of the lever 9. In that position it will be seen that the connection between the link 10 and the end of the crank 5 is comparatively close to the fixed axis of the lever 9, hence a downward pull on the free end of the lever is multiplied on the end of the lever 5, so that the transom 4 will be powerfully moved in a direction to close it. When the transom is fully closed, as shown in Fig. 3, although the operating handle of the lever 9 is less efficient than in the starting position shown in Fig. 1 because of the gradual and progressive decrease in the leverage on crank 5 in the movement from transom-open to transom-closed position, the angle of the crank 5 relative to the transom is such that a direct pull of the sliding bar 6 and link 8 is transmitted thereto through the link 10. This is rendered most effective by the pivotal connection of link 8 to lever 9 at the point of connection of link 10 thereto. By this arrangement of compound levers and links an exceedingly compact structure is provided, which occupies but very little space and which may consequently be installed within comparatively thin door-casings.

What I claim therefore and desire to secure by Letters Patent is:

1. Operating means for swinging closures comprising a crank adapted for connection to and operation of a swinging closure, an actuating lever pivoted adjacent to and on a center different from but within the radius of said crank, the center line of said lever being arranged to cross the center line of said crank between the ends of said crank, a link connection between said crank and lever arranged to actuate said crank on the turning of said lever, and manually controlled means for turning said lever.

2. Operating means for swinging closures comprising a crank adapted for connection to and operation of a swinging closure, an actuating lever pivoted adjacent to and on a center different from that of said crank, a link pivotally connecting said lever with said crank at a point located a greater distance from its pivotal center than the pivotal center of said lever, and manually controlled means for operating said lever.

3. Operating means for swinging closures comprising a crank adapted for connection to and operation of a swinging closure, an actuating lever pivoted adjacent to and on a center different from that of said crank, a link pivotally connecting said crank and le-

ver at points adjacent their free ends and maintaining said parts at all times at an angular relation to each other, and manually controlled means for operating said lever
5 connected thereto at a point outside of its pivotal center.

10 4. Operating means for swinging closures comprising a crank arranged for connection to and operation of a swinging closure, a lever pivoted adjacent to and on a center different from that of said crank and extending at an angle thereto at all times, a link pivotally carried by said lever and operatively connected to said crank at a point located
15 at a greater distance from its pivotal center than the pivot for said lever, and manually controlled means in operative connection with said lever.

5. Operating means for swinging closures comprising a crank arranged for connection 20 to and operation of a swinging closure, a lever pivoted adjacent one end on a center adjacent to and different from that of said crank and extending at an angle relative to said crank, a link pivotally interconnecting 25 said lever and crank, a manually controlled operating means in connection with said lever at a point removed from its pivotal center, and a compensating spring connected to said operating means and arranged to assist 30 the same proportionately with the load thereon.

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