No. 667,040. Patented Jan. 29, 1901.

G. C. SMITH.

FASTENING APPARATUS FOR WINDOWS.

(Application filed June 25, 1900.)

(No Model.)

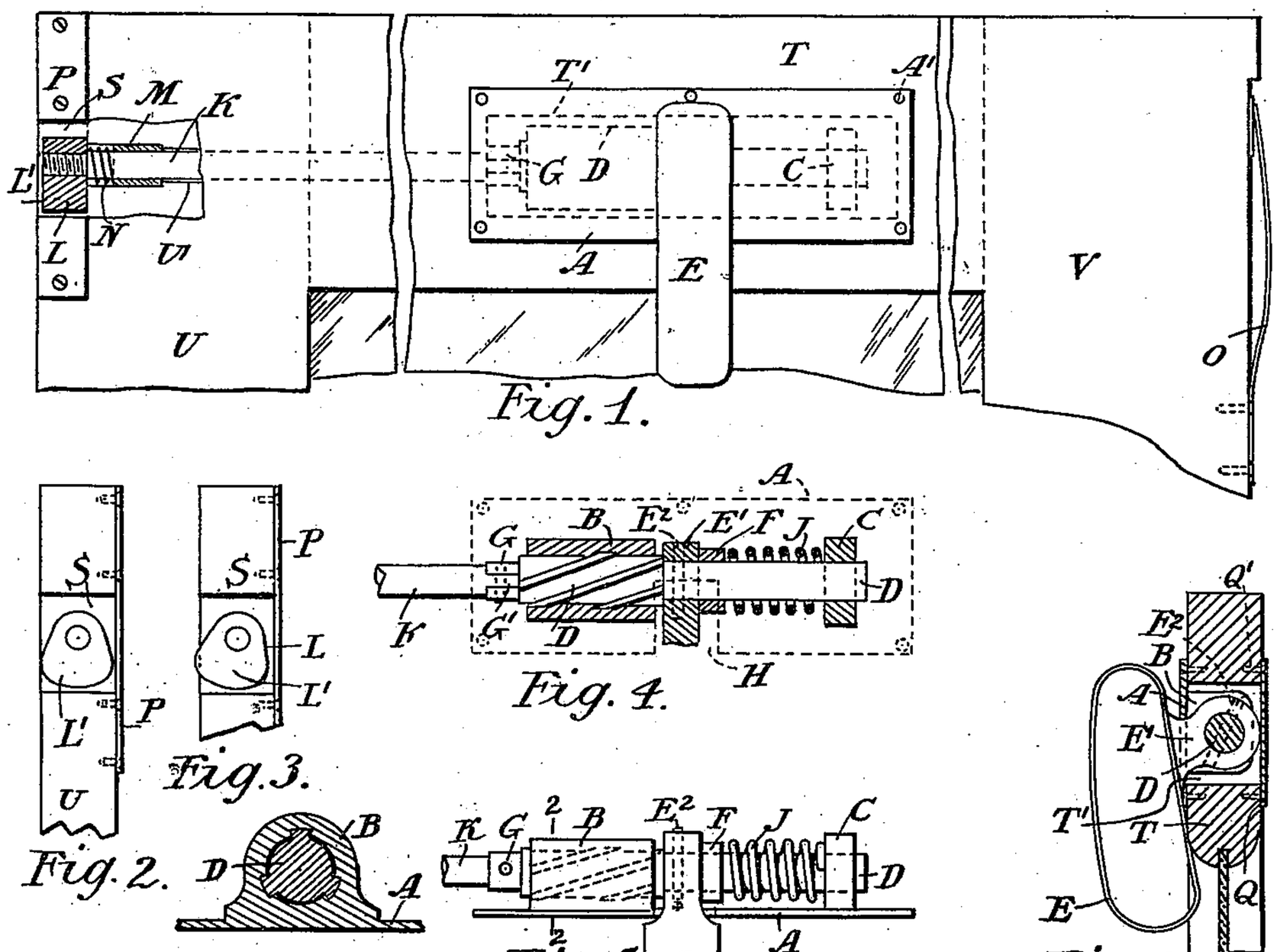

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5A

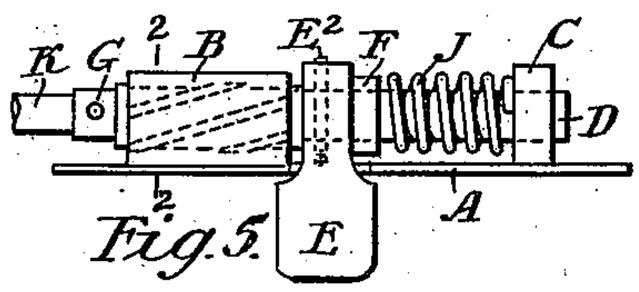

Fig. 5.

Fig. 6.

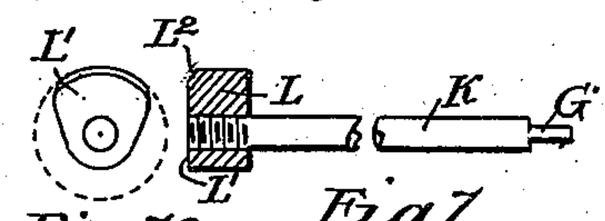

Fig. 7A

Fig. 7.

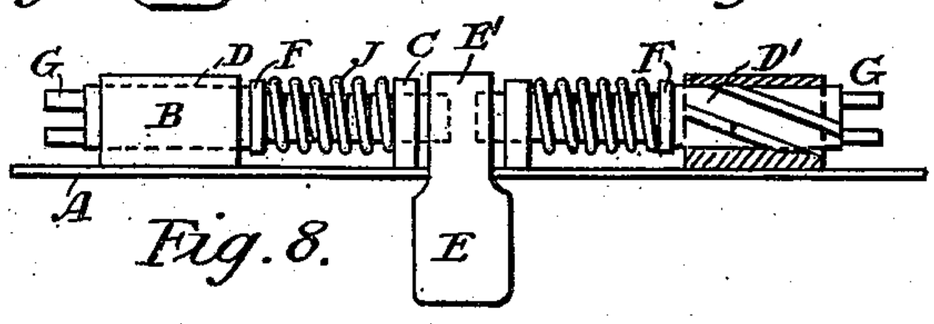

Fig. 8.

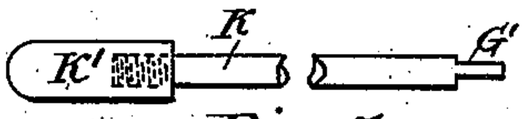

Fig. 7B

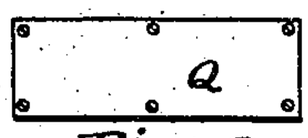

Fig. 9.

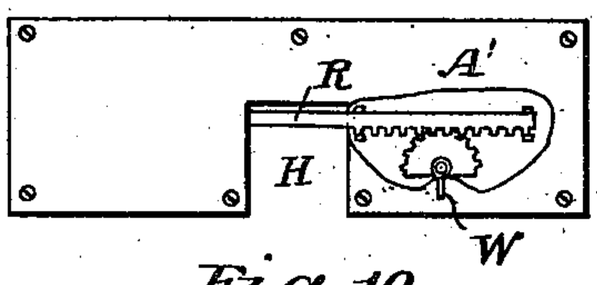

Fig. 10.

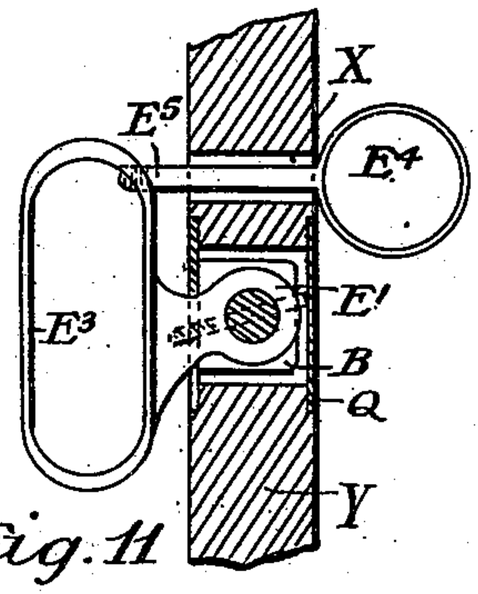

Fig. 11

Witnesses.
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UNITED STATES PATENT OFFICE.

GEORGE CROCKER SMITH, OF ST. KILDA, VICTORIA.

FASTENING APPARATUS FOR WINDOWS.

SPECIFICATION forming part of Letters Patent No. 667,040, dated January 29, 1901.

Application filed June 25, 1900. Serial No. 21,399. (No model.)

To all whom it may concern:

Be it known that I, GEORGE CROCKER SMITH, a subject of the Queen of Great Britain, residing at No. 57 Odessa street, St. Kilda, in the Colony of Victoria, have invented certain new and useful grip or fastening apparatus for the windows and louvers of railway-carriages, tram-cars, and other vehicles, and also applicable to drawers, gates, and the like, of which the following is a specification.

This invention has been devised to provide a locking or holding appliance which upon a slight movement of the hand by a passenger in a railway-carriage, for instance, releases the window, previously secured by my appliance, enabling such window to be adjusted or closed with a minimum of exertion, or, vice versa, by a similarly slight movement of the hand such window is most firmly and securely set or locked in position at the required height.

The invention is also of considerable value as a securing device for doors of various descriptions or for drawers in connection with cabinet-ware and may also be applied with advantage to securing gates.

In order that my invention may be the more easily understood, reference may be made to the accompanying drawings, in which—

Figure 1 shows an elevation, partly in section, of one form of my invention in position upon a railway-carriage window, Figs. 2 and 3 being end views in altered position of Fig. 1. Fig. 4 is a front elevation, partly in section; and Fig. 5 is a plan of a portion of the lock embodying my improvements, Fig. 5^A being a cross-section of Fig. 5 on the line 2 2, drawn to a larger scale. Fig. 6 shows an end elevation in section showing the position of the lock and handle as situated in the top rail of the window. Fig. 7 shows a shaft with a grip-head at its end, and Fig. 7^A an end view thereof, while Fig. 7^B shows an altered position of shaft K in Fig. 7. Fig. 8 shows a plan, partly in section, of double grip appliance. Fig. 9 shows an elevation of the back plate, while reduced in size for convenience in arrangement of drawing. Fig. 10 shows a front view of locking device, in which a key may be employed for preventing the door being operated by irresponsible persons. Fig. 11 shows a double handle arrangement, so that the lock may be operated from either outside or inside.

In the figures, T is the top rail of a railway-carriage window, in which a rectangular mortise T′, preferably about four and a quarter inches long by one inch wide, is made, said mortise being shown by the dotted lines. This mortise is covered by slotted metal plate A, (see Fig. 6,) and a central longitudinal hole U′ is bored through U, Fig. 1, to meet the mortise T′, and just large enough to allow the shaft K to partly revolve freely therein. The bored hole U′ is slightly increased in diameter at its outer end, so as to allow the bearing M to be provided for the shaft K. At the end of the longitudinal shaft K a small chamber S is provided, (see Figs. 1, 2, and 3,) the left side of which is cut out to the depth of the groove in which the window-frame works and long enough to allow grip L to move in.

L is a segment of a circle of metal which is screwed and brazed to the end of shaft K, forming a head which is eccentric or cam-shaped in side elevation. (See Figs. 1, 2, 3, and 7.) The edge L^2 of the segmental grip L is filed off or chamfered, so that it may not catch or abrade the side of the groove in which it works, and I desire it to be understood that L performs its gripping work by its end or wide face L′ and not by its top face or edge. K forms the true axis for L, and the latter constitutes the grip for holding the window in position. I would have it understood that I may use one or two shafts with segmental grips if increased strength should be found to be necessary; but in practice I have found one to be sufficient for all general purposes. The manner in which two grips are employed will be hereinafter described.

On the inner face of U (see Figs. 1, 2, and 3) a cover-plate P is screwed in position and is preferably about one-sixteenth of an inch thick and let in flush with the surface of the wood. The width of this plate equals the depth of the groove the frame works in, thus forming an aperture or opening on the outer side and end of the frame. This plate P prevents any friction between L and the inside edge of the groove, wherein the window-frame works.

A steel spiral spring N, (see Fig. 1,) consisting of about three convolutions, is placed

around K and between the segmental gripper or head L and the bearing M, in which K works. At the opposite end of T a bow or plate spring O is provided, so as to always exert a pressure toward the other side of the window, and it will be seen that the pressure on such spring has a tendency to prevent any side movement of the window.

Referring to the front plate A, a wide vertical slot H, Fig. 4, is provided in same, through which the shank E′ (see Fig. 6) of the handle E may work, the width of the slot H being sufficient to permit of a slight side travel of the shank E′ when the lock is operating. E′ encircles the shaft D, to which it is made rigid by set-screw pin E^2. (See Figs. 5 and 6.) The construction of this shaft is shown more particularly in Figs. 4 and 5. At the back of the plate A are cast lugs B and C, preferably of gun-metal, and both forming bearings for D. A portion of the shaft D is provided with a multiple-thread male screw of suitable pitch throughout its length, as shown, while the lug-bearing B has a correspondingly-cut female multiple screw to receive the thread of D. The other portion of the shaft D is cylindrical, the opposite end running in the smooth lug-bearing C. The shank E′ of the handle E operates against the end of the screw-thread and is rigidly fixed by the steel set-screw E^2, hereinbefore referred to. F, Figs. 4 and 5, is a washer, while J is a tempered-steel spiral spring, the whole being so arranged that the shaft D moves freely forward or backward while partly revolving through the lug-bearing C and the female-screw bearing B. At the end of the main shaft D is shown a bifurcated portion G, through which passes a steel screw at right angles thereto, this screw forming an articulation-piece with the corresponding end G′ of the shaft K. (See Figs. 4, 5, 1, and 7.)

Figs. 6 and 9 show a back plate Q, which is employed to cover the mortised chamber T′ on the outside of the window-frame. In these figures the apparatus comprised in the parts A and K are placed in position, as shown in Fig. 1, and the connection made between G and G′, thus forming an articulation. The wood-screws A′ (see Figs. 1, 2, 3, and 6) are then fastened and the back of plate Q similarly fixed by its screw Q′. The apparatus is then ready for use.

The *modus operandi* of my invention is as follows: The handle E is raised slightly by the hand of the passenger, the shafts D and K move and at the same time slightly revolve to the right, and the segmental grip or head L takes the position shown in Fig. 2. The window can then be moved up or down to any desired position, as the segmental grip-face L′ is out of contact with the bottom or back of the groove in which the window-frame works. Upon releasing the handle the springs J and N cause the shafts D and K to move around to the left by the means of the screw-thread, thus bringing the concentric edge of the segmental grip-head into contact with the outer edge of the groove, and the falling motion of the window causes the shafts K and D to further revolve in the same direction and to consequently force L′ into a close grip on the bottom or back of the groove, thus creating an end-thrust grip. A glance at Fig. 3 will explain the approximate position of L when the grip-face L′ is in operation. Such position is determined by the amount of play between the frame and the sides of groove. Similarly when the grip-face L′ meets the bottom of the groove the bow-spring O becomes compressed to a flat surface, and thus makes an additional grip on the edge of V. All the movements act synchronously, and the drop of the window during fastening is so small as to be unimportaut. Any additional weight of the top rail T causes the grip-head L to travel farther, which thus gives the increased grip on its end flat face. The leading edge of the segmental grip L is filed off, so as to prevent it from bruising its side of the groove. The portion filed away is shown by the dotted line L^2 (see Figs. 2, 3, and 7) in its endlong movement.

Fig. 7^B shows the form of bolt-head K′ which I prefer to use in cabinet-work, doors, and gate-fastenings.

Fig. 10 shows the form of front plate, in which A′ is the plate, and W a keyhole, to operate by rack and pinion the slip-bolt R, which may pass over the top of E′, and thus prevent the handle being raised.

Where a double grip apparatus is required, my apparatus may be arranged in the manner shown on Fig. 8, which illustrates a plan, partly in section, of a double grip, D being the shaft with the left-hand multiple thread and D′ being the right-hand similar thread. The inner ends of these shafts are square and pass into squared holes in E′, both having a limited endlong motion therein. The washers F F and the other parts are similar to a single grip, hereinbefore referred to, and particularly illustrated in Figs. 4 and 5.

Fig. 11 shows an end view of the form of handle E^3 when the apparatus is used for doors and gates. In such figure, Y is the door or gate, presumably of about one inch in thickness. E^4 consists of a rod having at one end a brass handle and at the other end a stem E^5, provided with a screw-thread, screwed into E^3. An aperture or slot X is cut away in the wood frame Y to permit the stem E^5 to move sufficiently when it is desired to operate E^3 from the other side of the door or fence, and it will be noticed that when E^4 and the outer side are pulled in a direction away from the frame Y such action will draw bolt just as though the handle E^3 was directly operated from inside of the door. If, however, the locking appliance shown on Fig. 10 has been previously set with the key at W, the bolt R will of course prevent the shank E′ from rising, and it will be impossible, therefore, to open the door or gate. The front and back

plates A and Q are in the case of Fig. 11 preferably let in flush with the surface of the wood.

While the head or segment L is referred to herein and in the claims as eccentric, it is to be understood that it does not form an eccentric grip in the sense that the cam-shaped edges of the head act as the grip. The actual grip is performed by the flat end face of said head binding against the bottom of the groove in which the frame is fitted. This is due to the fact that when the handle is operated so as to turn the head from the position shown in Fig. 2 to the position shown in Fig. 3 the cam-shaped side of the head is projected, so as to engage the side of the groove of the casing in which it works, and then any falling movement of the window causes the head to rotate farther in the same direction. This rotates the rod or shaft K, and the threaded portion of the shaft D, working in the threaded bearing B, causes the rod K and the head L′ to move outward and to bind, as described.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. A sash-fastener comprising an eccentric or cam-shaped head secured to the outer end of a shaft or rod, means for manually rocking the rod and head, and means for moving said rod longitudinally to project the head in the direction of the axis of said rod.

2. A sash-fastener comprising an eccentric or cam-shaped head secured to one end of a shaft or rod, means for manually rocking the rod and head, and means for moving said rod longitudinally to project the head in the direction of the axis of the rod, a spring being provided for aiding the longitudinal movement of said shaft or rod.

3. The combination with a frame such as a window, door or gate frame, said frame having a recess in its edge and said recess being open at its end and inner side, the other side being closed, of an eccentric head mounted to rock in said recess and to move in the direction of its axis, the closed side of the recess preventing friction between said head and one side of the groove in which the frame is adapted to fit, and means for rocking said head and for forcibly projecting it from the recess in the direction of its axis.

4. The combination with a frame such as a window, door or gate frame, said frame having a recess in its edge and said recess being open at its end and inner side, the other side being closed, of an eccentric head mounted to rock in said recess and to move in the direction of its axis, the closed side of the recess preventing friction between said head and one side of the groove in which the frame is adapted to fit, means for rocking said head and for forcibly projecting it from the recess in the direction of its axis, and means for locking the device against movement on its axis.

5. The combination with the shaft or rod K having a head at one end adapted to bind against an opposing surface, of the shaft D coupled to the shaft K and having screw-threads, the bearing B having internal screw-threads, a handle secured to the shaft D, and a spring normally pressing said handle and the shafts D and K in one direction.

6. In combination shaft as D having at one end thereof a male screw-thread engaging with female screw-thread bearing as B and being cylindrical and smooth and revolving in a plain parallel bearing as C at the other end, means for operating such shaft so as to cause it to partly revolve, and spring as J the whole forming an actuating mechanism for securing or releasing the gripping or locking appliance substantially as and for the purposes set forth.

7. In combination shaft as D one end of which carries means for forming an articulation with another shaft as K, a multiple screw-thread mounted upon one portion of said shaft as D and corresponding multiple female-screw bearing as B, a slotted metal plate as A carrying the screw-bearing B and a smooth parallel bearing as C, means for moving D backward and forward in its respective bearings, a gripper or locking shaft as K provided with a gripping device at its end substantially as and for the purposes set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE CROCKER SMITH.

Witnesses:
A. O. SACHSE,
A. HARKER.