

(No Model.)

H. S. WAINWRIGHT & R. HYDE.

SASH HOLDER.

No. 412,312.

Patented Oct. 8, 1889.

Fig. 1.

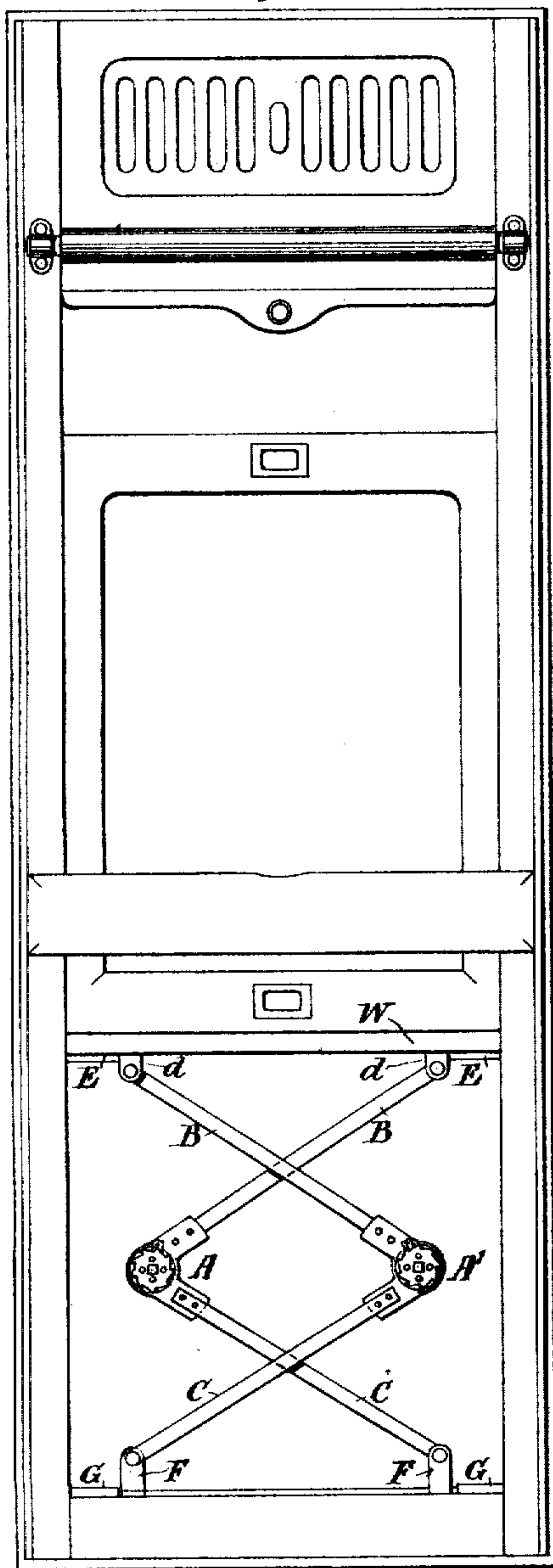


Fig. 2.

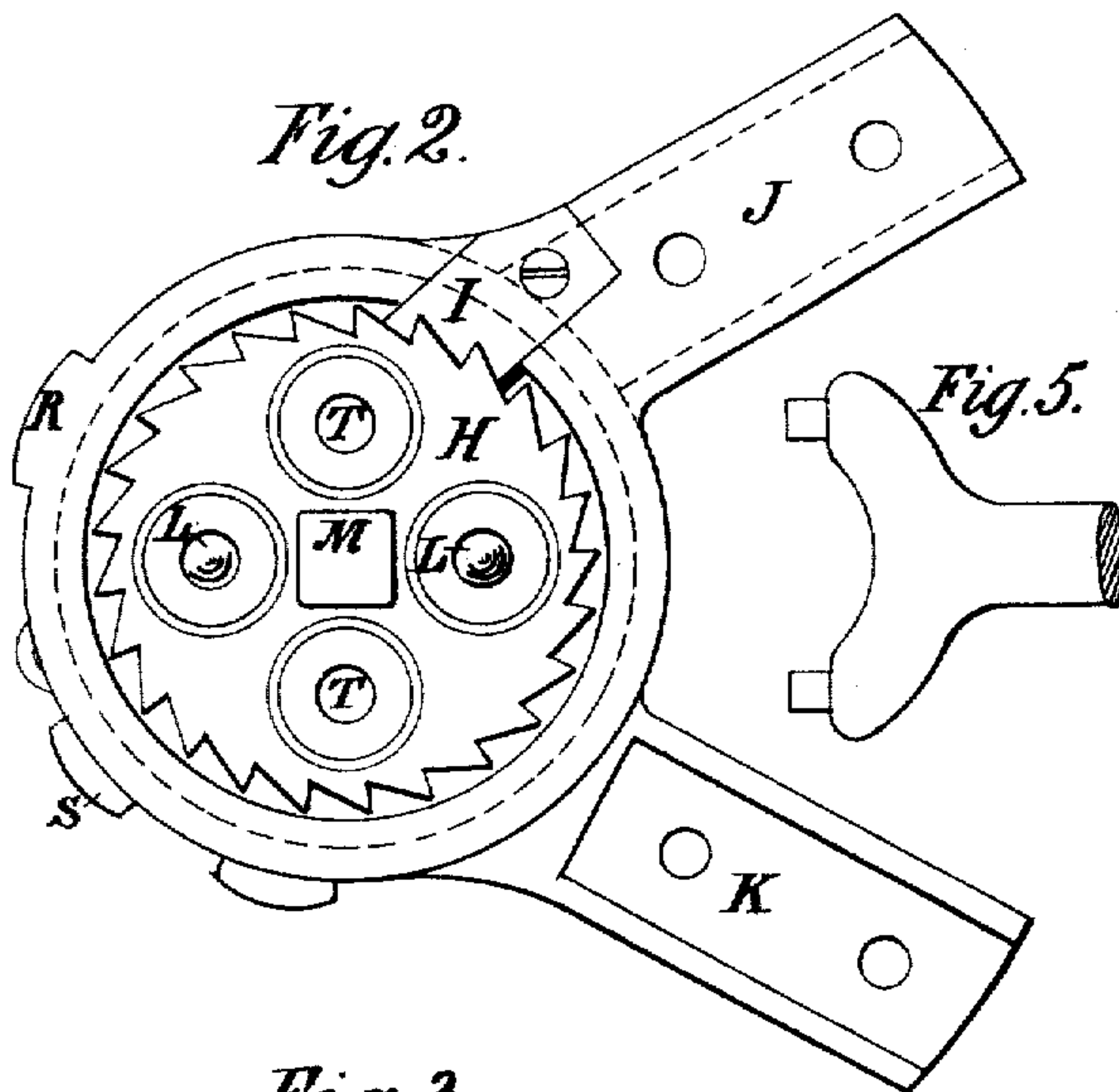


Fig. 5.

Fig. 3.

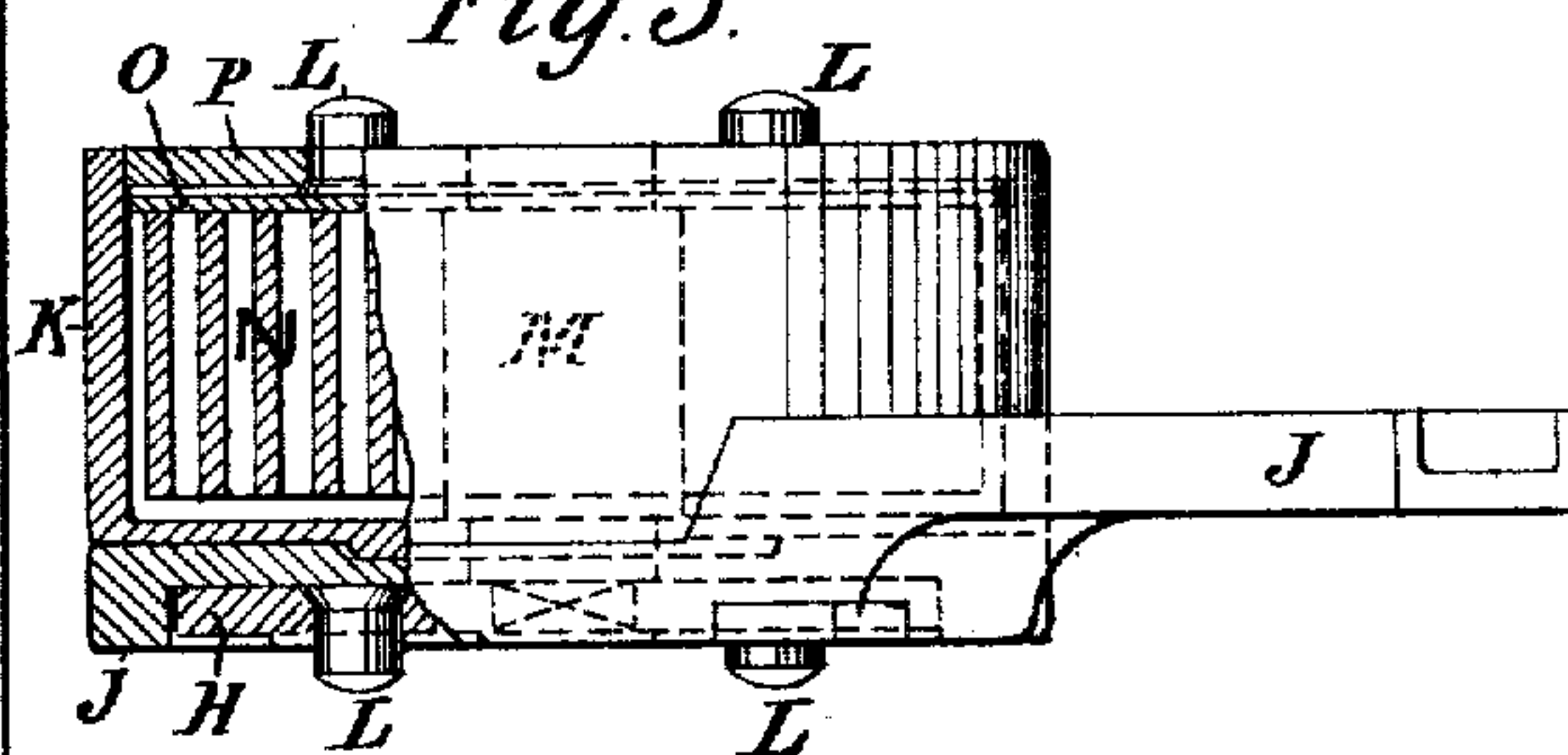
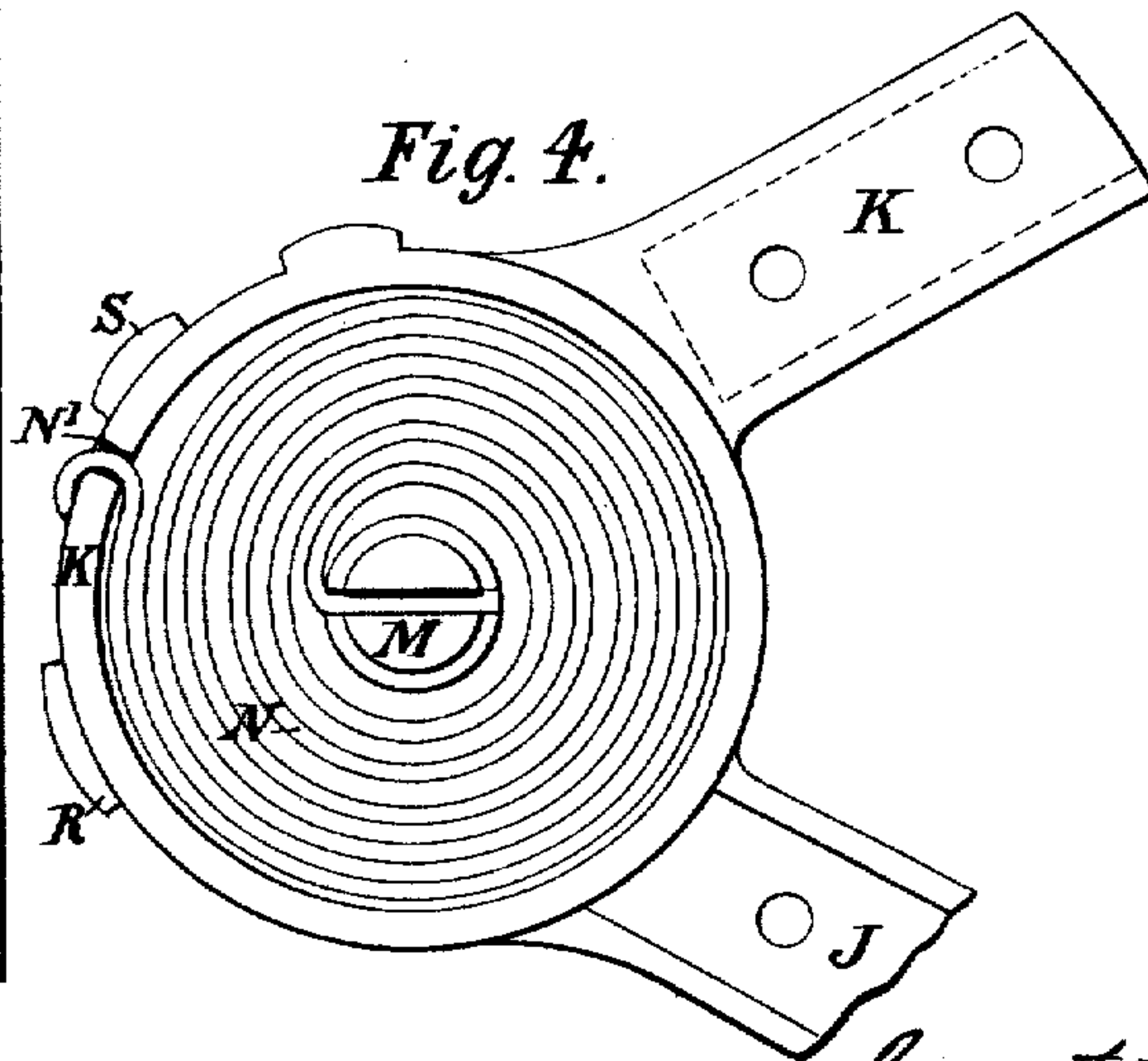


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

HARRY S. WAINWRIGHT, OF ASHFORD, COUNTY OF KENT, AND ROBERT HYDE, OF SHEFFIELD, COUNTY OF YORK, ENGLAND.

SASH-HOLDER.

SPECIFICATION forming part of Letters Patent No. 412,312, dated October 8, 1889.

Application filed May 21, 1889. Serial No. 311,565. (No model.) Patented in England October 1, 1888, No. 14,073.

To all whom it may concern:

Be it known that we, HARRY SMITH WAINWRIGHT and ROBERT HYDE, subjects of the Queen of Great Britain, residing, respectively, at Ashford, county of Kent, England, and at Sheffield, county of York, England, have invented certain new and useful improvements in apparatus for raising, lowering, and supporting sliding windows or shutters in buildings or vehicles with or without draft-excluders, (in part patented to us in Great Britain October 1, 1888, No. 14,073;) and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to improvements in apparatus for facilitating the raising and lowering and also for supporting sliding windows or sashes or shutters, such as those used in railway-carriage doors, the doors of other vehicles, or the windows of buildings.

It consists of a combination of levers and springs so arranged that a compensating action between the levers and the springs is obtained as their powers are increased or diminished according to their raised or lowered position.

The apparatus may either be used separately or in combination with a bar draft-excluder placed under and sliding with the window or shutter.

The invention is carried into practice as follows: We use two or more springs, which are coiled in suitable boxes, and two pairs of levers, each pair being joined together by the spring-boxes above mentioned, so that the springs will force them apart like opening a pair of compasses. The springs are so adjusted that when the two pairs of levers are placed in position they will support the window or sash or shutter (as the case may be) on their upper ends in any part of its movement up or down. The upper and lower levers cross each other in pairs, and one of each pair may be made double or be provided with a slot through which the other may be passed to guide and steady the apparatus. One end of each of the lower levers is jointed to a stud or bracket which rests in the bottom of the

window-recess. The top end of each lever is also jointed upon a bracket or its equivalent secured to the bottom of the sliding window sash or shutter, or to a bar draft-excluder, where such is used. Elastic cushions may be conveniently placed to receive the weight of the window or shutter when pushed down quickly. The springs at the center joints of each pair of levers are boxed up with a center pin through each. One lever engages with the box and the other with the said pin, the spring being attached to the pin and to the box of each pair, respectively. We also attach to each pair of levers and to the spring-box a ratchet-wheel and catch, to enable the power of the spring to be adjusted to suit the various weights of windows or shutters. The top ends of the levers will rise to a nearly vertical position over the bottom joints when the window or shutter is raised and the center spring-joints approach each other. (Describing part of a circle.) The leverage is thus shortened as the springs approach their weakest position, and the apparatus thus retains a nearly uniform lifting-power throughout the travel of the window. We also provide (when necessary) at suitable parts of the apparatus stops or abutments to regulate the length of the travel or movement of the window or shutter.

In order that our invention may be clearly understood and the mode in which we prefer to carry it into effect may be fully described, we annex a sheet of drawings showing its application to a railway-carriage door, for example, in which similar letters of reference indicate similar parts in any of the figures, and are referred to in the description.

Figure 1 is an inside elevation of a railway-carriage door with the lower casing thereof removed to exhibit the apparatus. Figs. 2, 3, and 4 are enlarged views of one of the center-joint spring-boxes; and Fig. 5 is a like view of a spring-adjusting key.

A A' are the spring-boxes at the center joints, into which coiled springs are fitted to open or force apart the levers B and C, the action being like that of a pair of compasses, the closing or return action being effected by the weight of the window with the assistance

of a slight pressure of the hand. The springs at the center joints are so adjusted that they balance or support the window on the top ends of the levers B, which are jointed to the brackets or studs *d*, (which may be separate or united,) and are fixed to the under side of the window, or to the bar draft-excluder W when one is used. The ends of the levers C are similarly secured to studs *f* at the bottom of the window-recess.

When the window is pushed down, the spring-boxes A A' rest upon the elastic cushions G, and the cushions E descend on the top of the boxes A A'. This action relieves the concussion when the window is pushed down quickly.

One of the top levers B we prefer to make either double or with a long slot in it to receive and act as a guide for the other lever B, and to give steadiness to the apparatus; but we may dispense with the said slot and allow the levers to work side by side, as shown in Fig. 1.

The spring-boxes A A' are free to move with the levers, and in doing so they describe part of a circle when the window is either raised or lowered.

When the window is raised, the springs in the boxes A A' are partly uncoiled and become weaker; but at the same time the leverage is gradually shortened by the boxes approaching each other, and vice versa, and thus a practically uniform lifting-power is maintained throughout the length of travel of the window.

The spring-boxes A A' illustrated in Figs. 1, 2, 3, and 4 must be right and left hand. H is a ratchet-wheel fixed on its center pin M, to enable the spring N to be regulated to suit the different weights of windows, and it is retained by a catch I, which engages with the teeth of the wheel and is secured to the arm J, to which the lever B is also attached, as shown, or the parts J and B may be made in one piece.

The arm J is recessed to receive the ratchet-wheel H, as shown in Fig. 3, which is riveted on one end of the center pin M, which passes through the parts J and K with round bearings, and is increased in its diameter inside the box A. We cut a slot across the pin M to receive one end of the spring, as seen in Fig. 4. The arm K is attached to lever C in a manner similar to that of J and B before described, and a slot N' is cut in the side of the box to receive the outside end of the coiled spring N, Fig. 4.

To prevent the apparatus rattling against the sides of the door-casing, we may use rubber buffers L, Figs. 2 and 3, inserted through the ratchet-wheel H and the back cover-plate P, which may be attached to the box-casing K by any suitable means. A thin plate of metal O, placed at the back of the rubber buffers L, prevents them being caught by the

spring. The buffers may be omitted, if desired. The pin-key shown in Fig. 5 is used for adjusting the coiled spring by inserting the pins in the corresponding holes T in the ratchet-wheel H and releasing the catch I. The key may have any suitable handle.

In Fig. 4 we show the coiled spring in plan, the cover-plate P being removed. The inner end of the spring passes through a slot in the center pin M, and the outer end passes through a slit N' in the side of the box K, and is bent to clasp the side of box.

The spring N, when secured in the joint-box in the manner before described, acts, through the axle M, to which it is secured, through the ratchet-wheel H and catch I on the lever B, and in the contrary direction on the lever C, by being connected to the part K by engaging in the slit N' in its side.

We may regulate the distance of travel of the two levers and of the window by means of stops, one being placed on the arm J (marked R) and one upon the box-casing K, (marked S, see Figs. 2 and 4,) the limit being reached when the stops come together.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In combination with a vertically-sliding window, window sash or shutter, a pair of levers beneath the same, a pivotal coupling uniting said levers in compass shape, a lifting-spring carried by the levers at said coupling and reacting against the respective levers, and pivotal attaching devices at the other extremities of the respective levers, substantially as hereinbefore specified.

2. In combination with a vertically-sliding window, or the like, two pairs of levers beneath the same, pivotal couplings uniting the levers of each pair in compass shape, the respective pairs being reversed relatively to each other, lifting-springs carried by the levers at said couplings and reacting against the respective levers, and pivotal attaching devices at the other extremities of the several levers, substantially as hereinbefore specified.

3. In combination with a vertically-sliding window and a dust-excluder bar beneath the same, two pairs of levers beneath said bar, pivotal couplings uniting the levers of each pair in compass shape, lifting-springs carried by the levers at said couplings and reacting against the respective levers, and pivotal attaching devices at the other extremities of the several levers, the upper attaching devices carried by the said bar, substantially as hereinbefore specified.

4. The combination, with the levers and lifting-springs, of the within-described spring-boxes forming pivotal couplings, which unite the levers in compass shape and within which said springs are coiled, each box having a center pin to which one end of the spring is at-

tached an adjusting-wheel fast on said pin and adapted to be turned by a key, and a catch which engages with said wheel to fasten it within the box, substantially as hereinbefore
5 specified.

In testimony that we claim the foregoing as our own we have hereto affixed our signa-

tures, in presence of two witnesses, this 26th day of March, 1889.

HARRY S. WAINWRIGHT.
ROBERT HYDE.

Witnesses:

ROBT. F. DRURY,
BERNARD E. DRURY.