

No. 892,644.

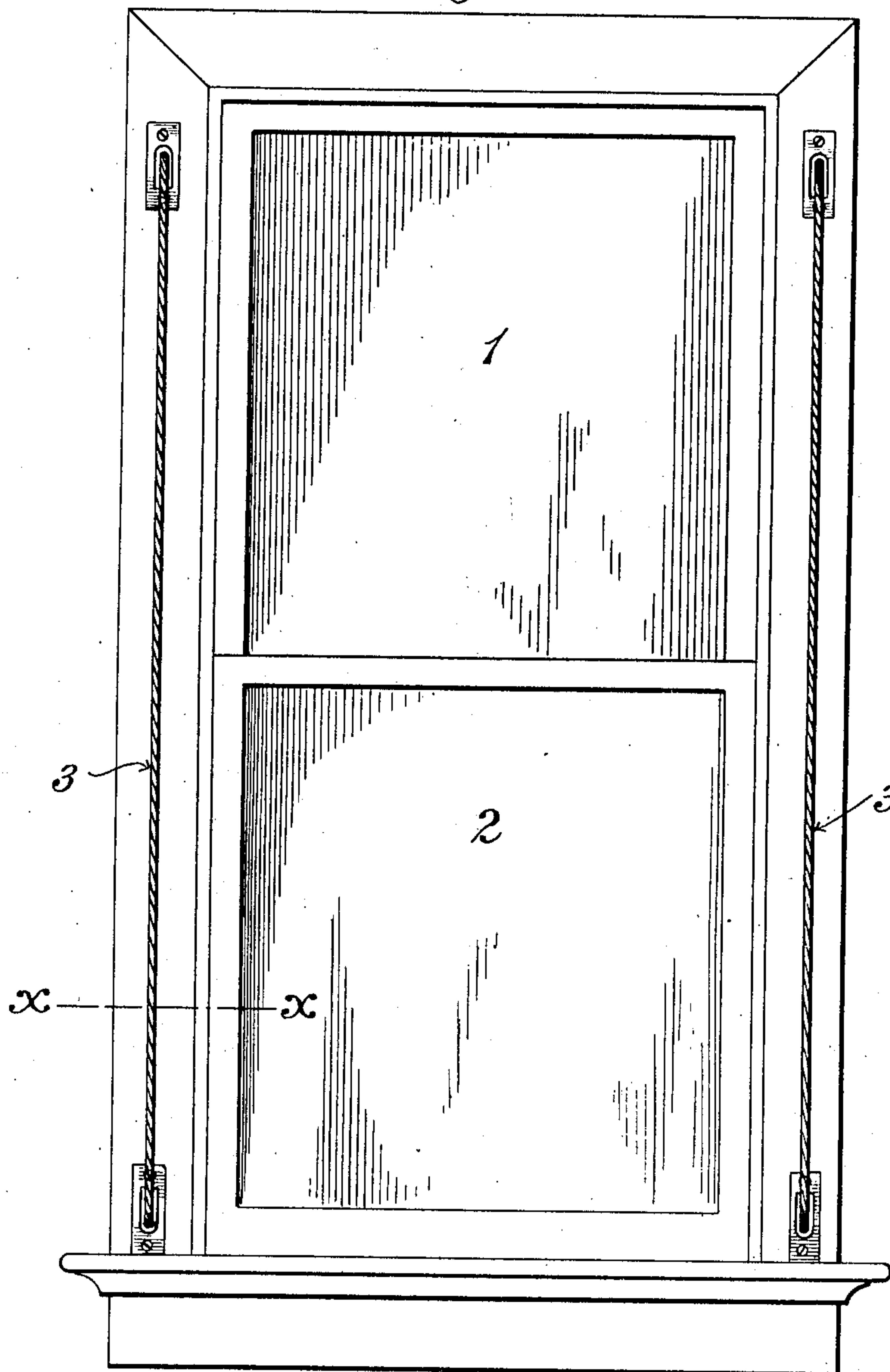
PATENTED JULY 7, 1908.

W. R. BULL.  
SASH LIFTER.

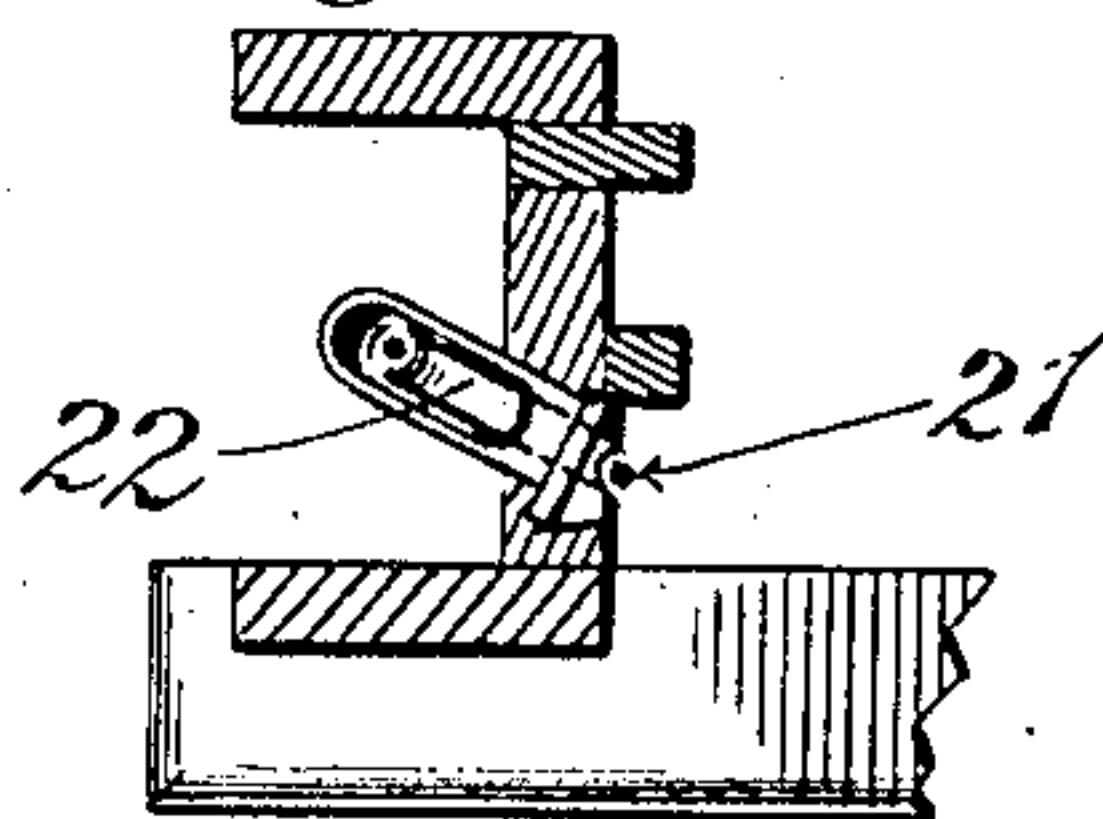
APPLICATION FILED MAY 7, 1908.

2 SHEETS—SHEET 1.

Fig. 1.



*Fig. 2.*



Witnesses  
Edward C. Rowland;  
Hathorne B. Chivers.

William R Bull  
Inventor

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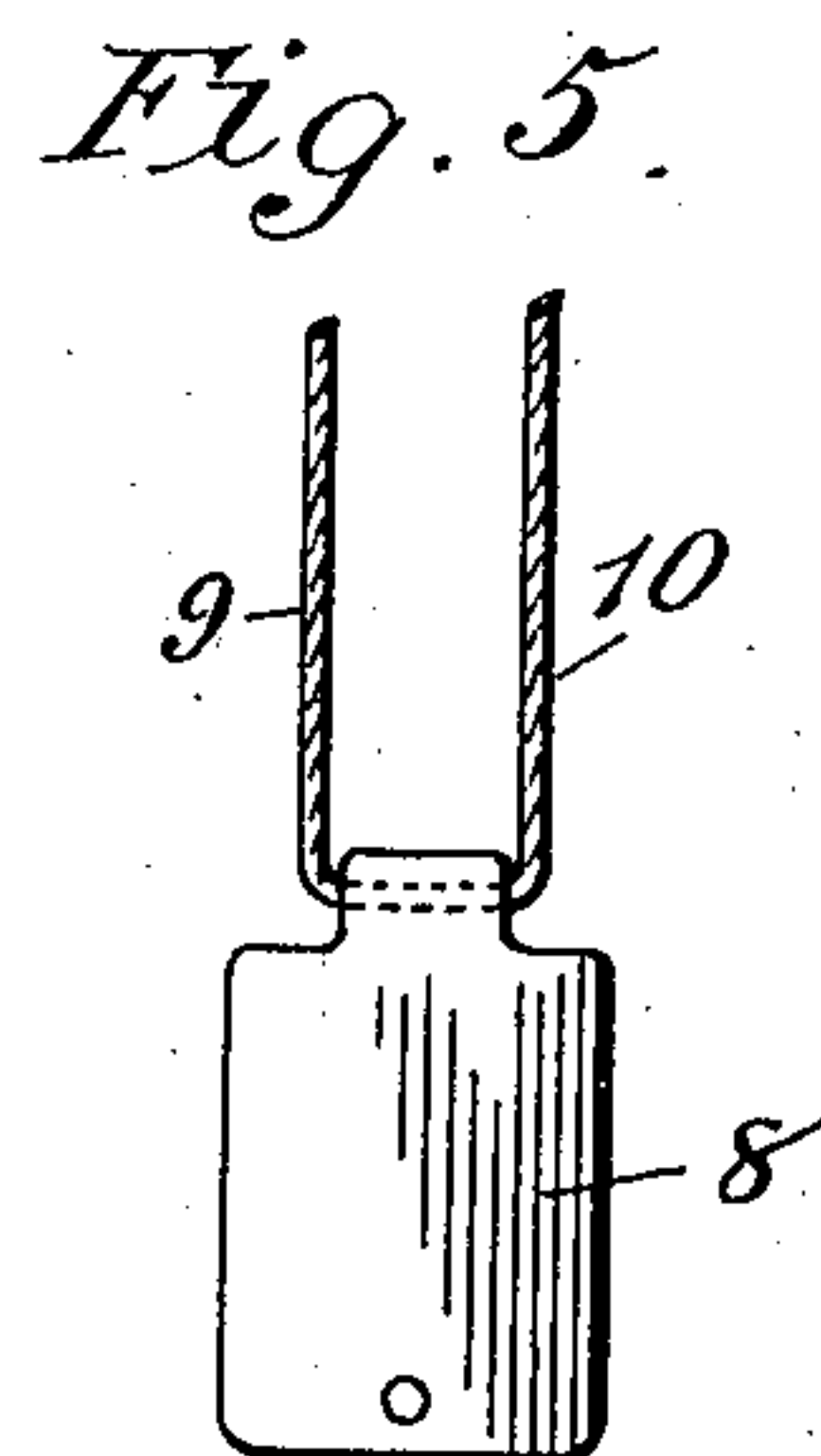
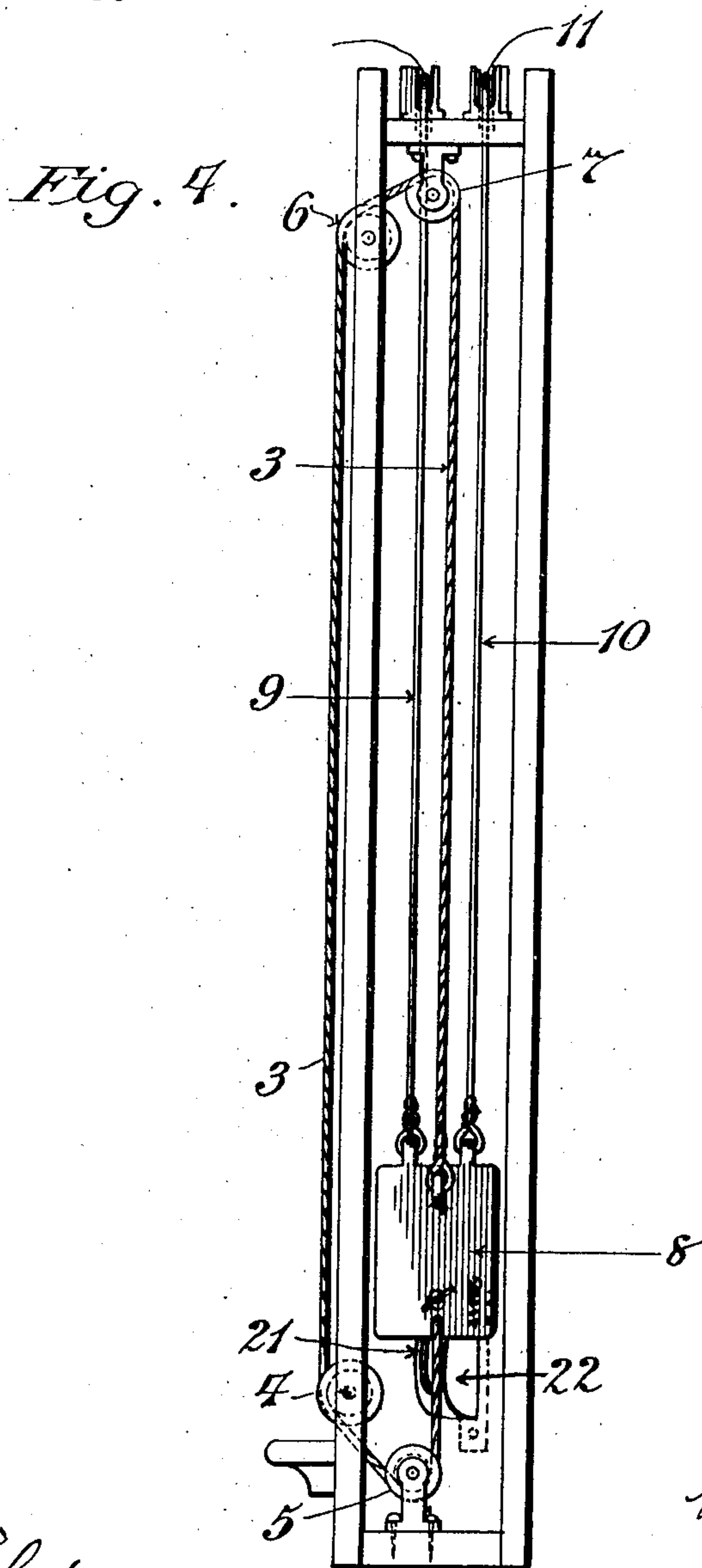
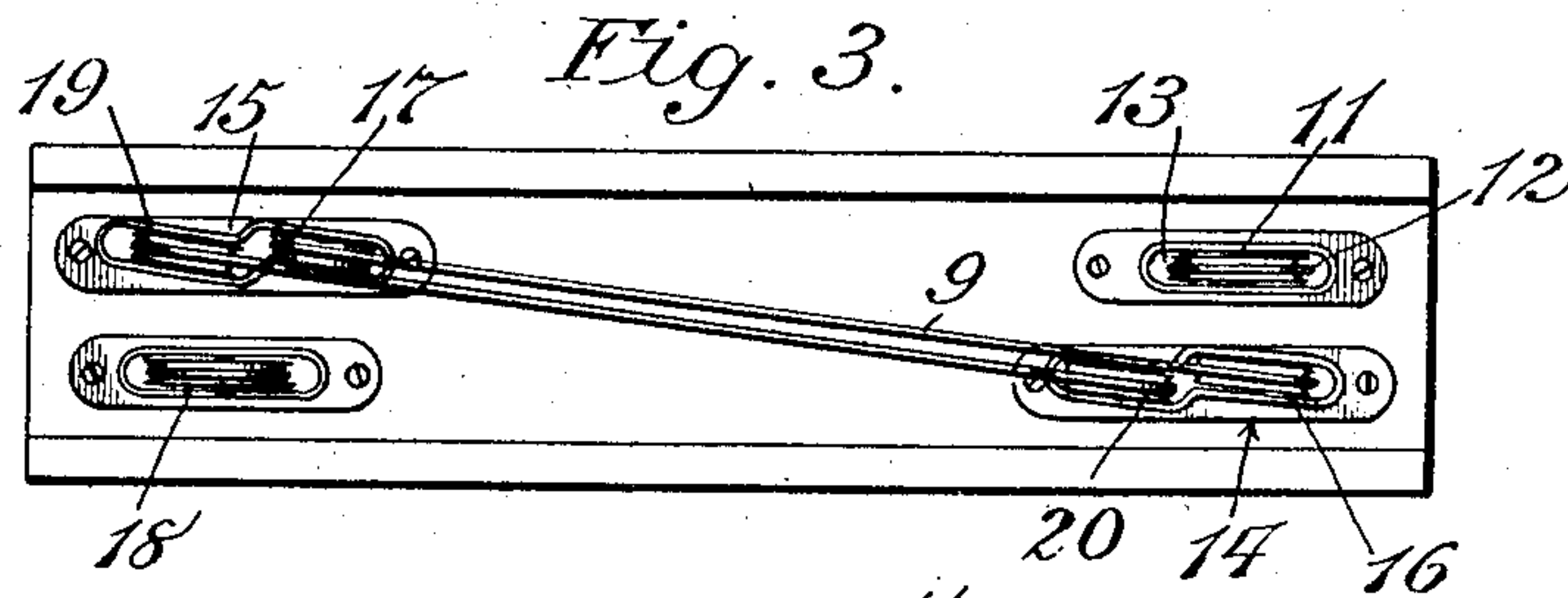
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SASH LIFTER.

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2 SHEETS—SHEET 2.



Witnesses  
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# UNITED STATES PATENT OFFICE.

WILLIAM R. BULL, OF PLAINFIELD, NEW JERSEY.

## SASH-LIFTER.

No. 892,644.

Specification of Letters Patent.

Patented July 7, 1908.

Application filed May 7, 1906. Serial No. 315,471.

*To all whom it may concern:*

Be it known that I, WILLIAM R. BULL, a citizen of the United States, residing in Plainfield, New Jersey, have invented a certain new and useful Improvement in Sash-Lifters, of which the following is a specification.

The present invention has relation to an improved means for facilitating the raising and lowering of window sashes without undue reaching and without the use of poles and the like which are often mislaid and often in the way.

In applying devices of this character to windows already built, it is highly desirable that the entire apparatus should be accommodated within the space already provided in the ordinary woodwork of the casement. At the same time a considerable expense is avoided where cast iron counter-weights can be used in place of expensive lead weights.

The present invention has for its principal object the provision of apparatus of the class above described so constructed that the entire width of the space in which the counter-weights run can be made available for the counterweight for each sash, while at the same time both sides of each sash, are balanced. Thus a wide cast iron weight can be used, avoiding on the one hand the use of lead and on the other hand the necessity of providing extra vertical room for a long iron weight.

A preferred form of my invention is illustrated in the accompanying drawings, wherein—

Figure 1 is an inside elevation of a window provided with my invention, Fig. 2 is a partial section thereof on the plane  $x-x$  in Fig. 1, Fig. 3 is a top plan view of the window and Fig. 4 is a side elevation thereof.

Each of the two sashes 1 and 2 is separately operated up or down at will by devices at their right and left sides respectively, which devices are operatively connected to separate counterweights which respectively balance the two sashes.

As the two sides of the window are arranged just alike Fig. 4 will be a sufficient illustration of both. In the preferred form shown, the manual operator takes the form of a cord 3 running over bottom pulleys 4 and 5 and top pulleys 6 and 7 on each side; the ends of which cord are attached to a counterweight 8. From each counterweight 8 there rise two sash cords 9 and 10 which extend respectively to the right and left sides of one

of the sashes. These are attached to each counterweight at points lying in a plane transverse to that of the window. The particular cords shown in Figs. 3 and 4 extend to the outer sash and travel over three pulleys at the top of the casement. The cord 10 runs in the plane of the outer sash over the pulley 11, coming up from the weight through the opening 12 and extending down to the outer sash in a well known manner through the opening 13 (see Fig. 3). The cord 9 runs first up the plane of the inner sash to a double block 14 having two communicating inclined pulley-ways as clearly shown in Fig. 3. A double block of this character is used on each side, one being in the plane of the inner sash and the other in the plane of the outer sash. These are shown at 14 and 15 respectively. They are exactly similar in construction and are interchangeable. The cord 9 shown in Fig. 4 runs over the outer pulley 16 in block 14 and thence horizontally and diagonally to the pulley 17 in block 15 where, having been thus brought into the plane of the outer sash, it turns vertically downward to be attached to the left side of said sash. Thus the two cords 9 and 10 from the one weight 8 are used to balance the outer sash. In the same way the two cords from the opposite weight (not shown) extend respectively over the pulley 18 to the left side of the inner sash, and over pulleys 19 and 20 to the right side of the same. A third cord 21 extends downward from each weight 8 and passes under a pulley 22 at the bottom of each side of the casement. As shown in Figs. 2 and 4, these pulleys 22 are arranged diagonally so that they receive the cord 21 at the median line on each side and deliver said cord under one side of its appropriate sash in the plane of the latter. The pulley 22 in Fig. 2 corresponds to the inner sash and that shown in Fig. 4 corresponds to the outer sash. While I prefer to use these lower cords 21, they are not essential to my invention.

It will be seen that, by use of the construction above described, I am able to provide a single counterweight for each sash, directly connected to the cord 3 or other manual operator, which weight may be given the full width of the space in which it moves and may be symmetrically connected by cords attached to points in a transverse plane and running to both sides of its corresponding sash.



Various changes will occur to those skilled in the art which may be made without departing from the spirit of my present invention, and I do not limit myself to the details herein shown and described.

What I claim is—

1. A window sash, a counterweight adapted to run at one side thereof, two flexible connections joining opposite sides of said counterweight to opposite sides of said sash respectively, said connections occupying a plane transverse to the window in their vertical parts, and a manual operator attached to said counterweight, substantially as described.
2. In combination with a window sash and a vertical runway beside it; a counterweight in said runway, two pulleys inclined to each other over one side of the sash placed side by side, a third pulley over the other side of the sash and in line with one of said first named pulleys, two cords attached to said weights at points in a plane transverse to the window, one of said cords extending from the sash over one of the two pulleys placed side by side and the other cord extending from the opposite side of the sash over said other two pulleys in line with each other and a manual operator connected to said counterweight, substantially as described.
3. In combination with an upper and a lower window sash, and a separate counterweight and cords for each on opposite sides thereof; a set of three pulleys above and on

each side of said sashes, each of said sets comprising a single pulley over one sash and two inclined pulleys in tandem over the other sash, all so arranged that each inclined pulley on one side is substantially in line with a corresponding inclined pulley on the other side, substantially as described.

4. In combination with a window sash and a runway on one side thereof, a weight arranged in said runway two pulleys inclined to each other directly over said weight and one side of said sash, a third pulley over the other side of said sash and alined with one of said first named pulleys and flexible connections running over said pulleys and joining opposite sides of said weight to opposite sides of said sash, substantially as described.

5. In combination with a window sash and a runway on one side thereof wider than the thickness of said sash, a counterweight in said runway set transversely to said sash, two cords extending upward from said weights for balancing said sash, a third cord extending downward from said weight and having its opposite end attached beneath said sash, a pulley for said third cord inclining from the middle of said runway to a point directly under said sash and a manual operator connected to said weight, substantially as described.

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Witnesses:

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