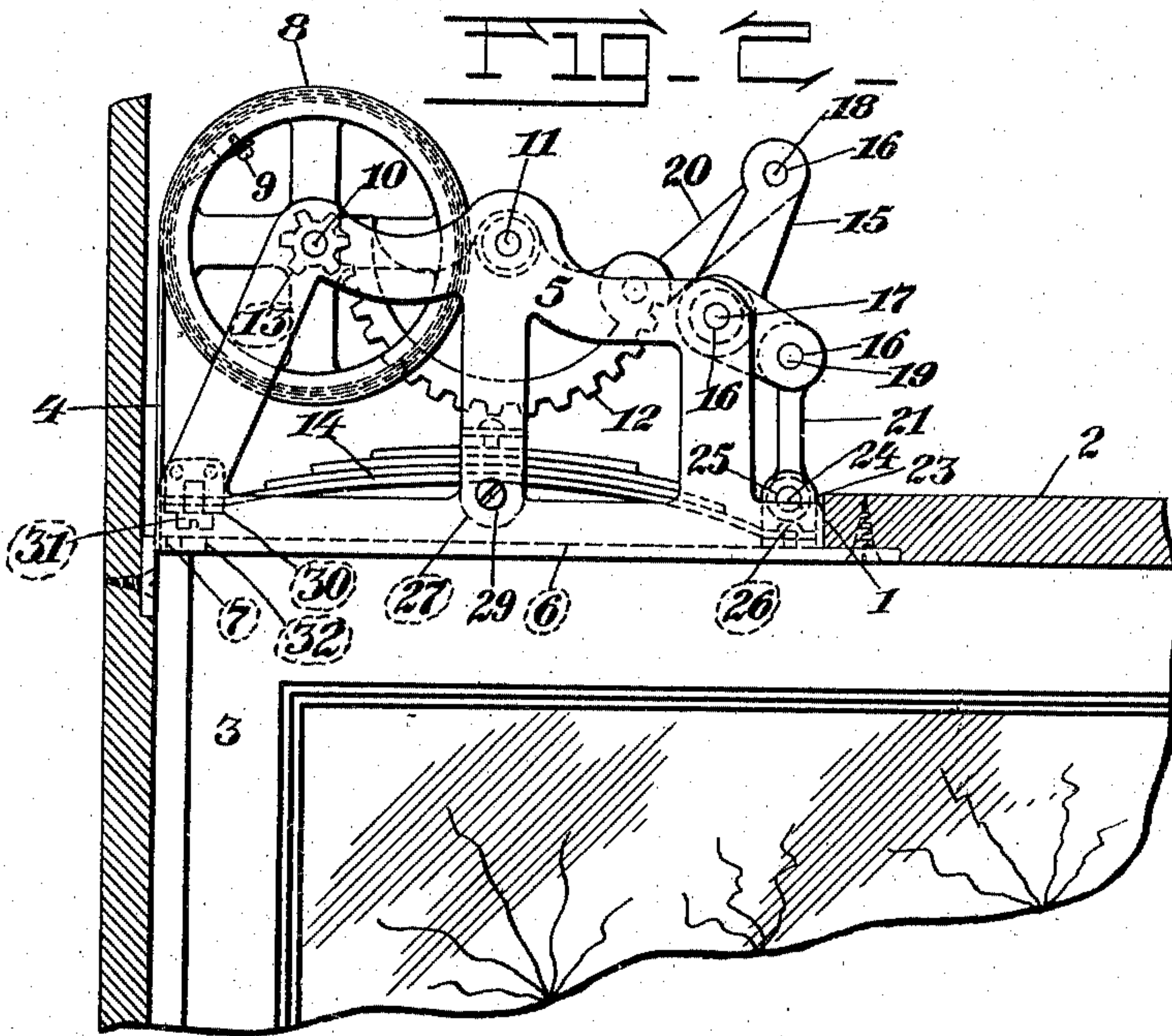
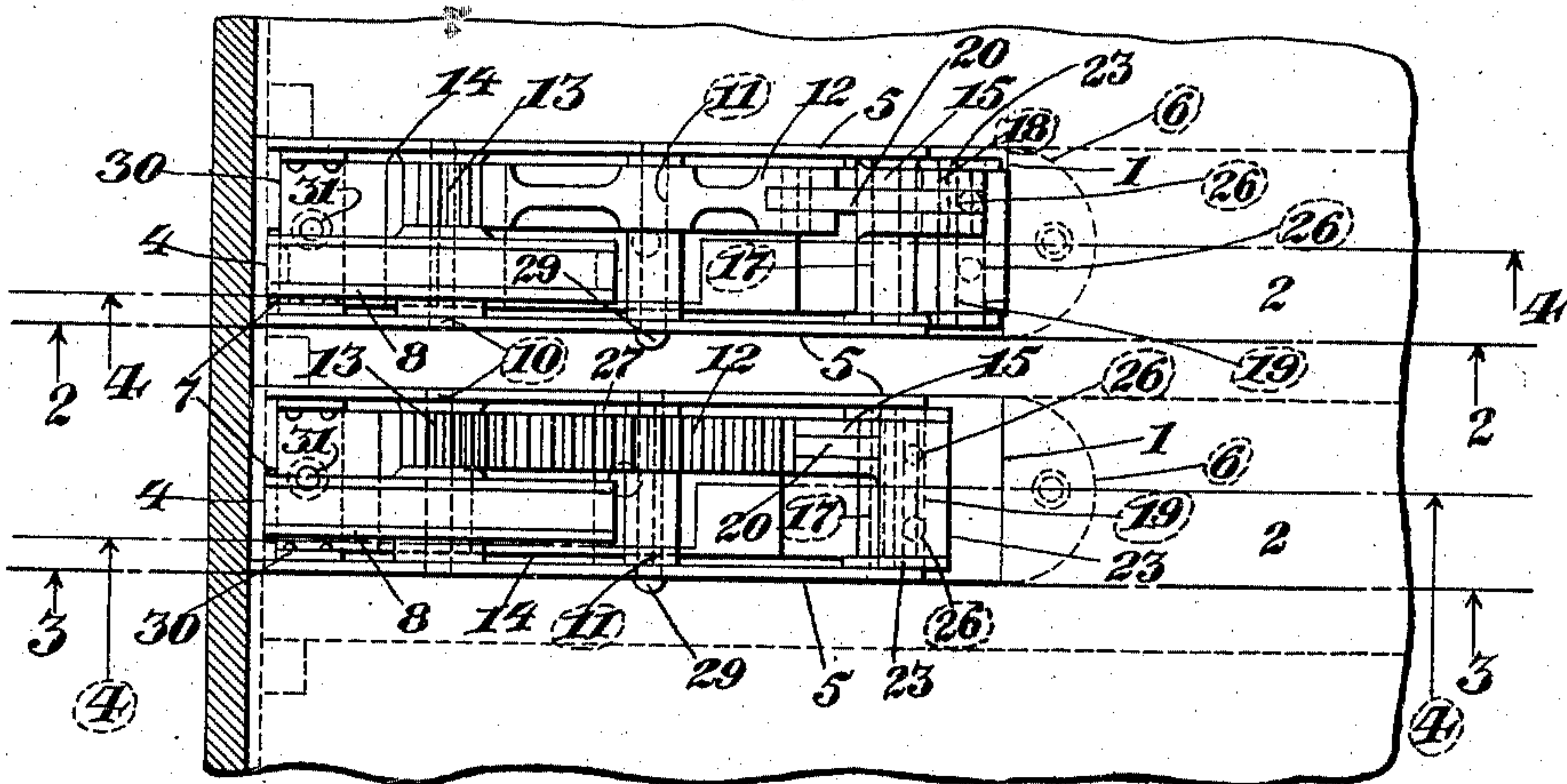


W. C. STEPHEN.
WEIGHT COMPENSATOR FOR WINDOWS, DOORS, AND THE LIKE.
APPLICATION FILED OCT. 7, 1909.

965,763.

Patented July 26, 1910.

3 SHEETS—SHEET 1.

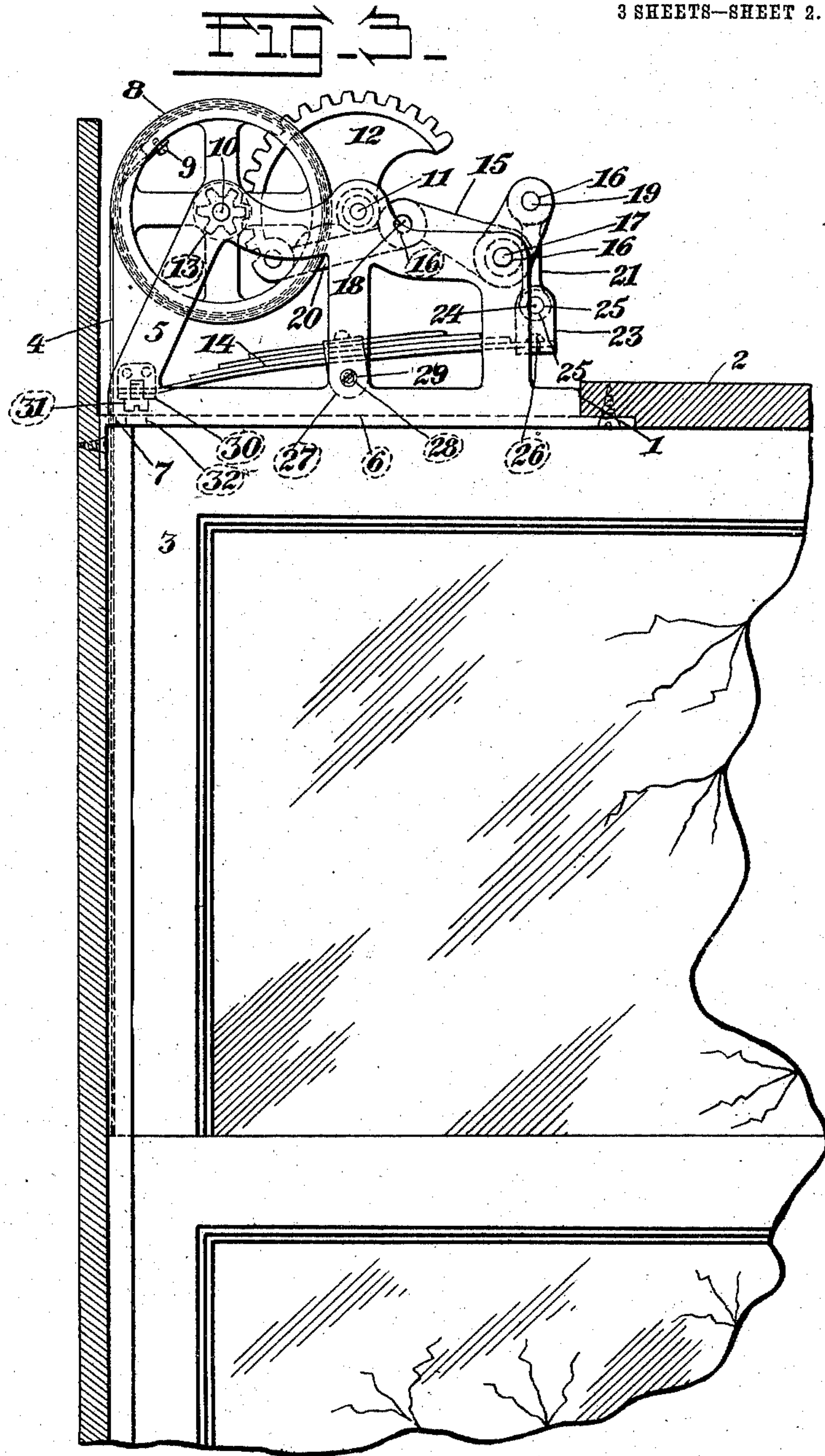


Witnesses:
Chas. A. Becker,
George G. Anderson.

Inventor:
William C. Stephen,
By Hugh N. Wagner
His Attorney.

965,763.

3 SHEETS—SHEET 2.



By Hugh N. Wagner.
His Attorney.

W. C. STEPHEN.
WEIGHT COMPENSATOR FOR WINDOWS, DOORS, AND THE LIKE.
APPLICATION FILED OCT. 7, 1909.

965,763.

Patented July 26, 1910.

3 SHEETS—SHEET 3.

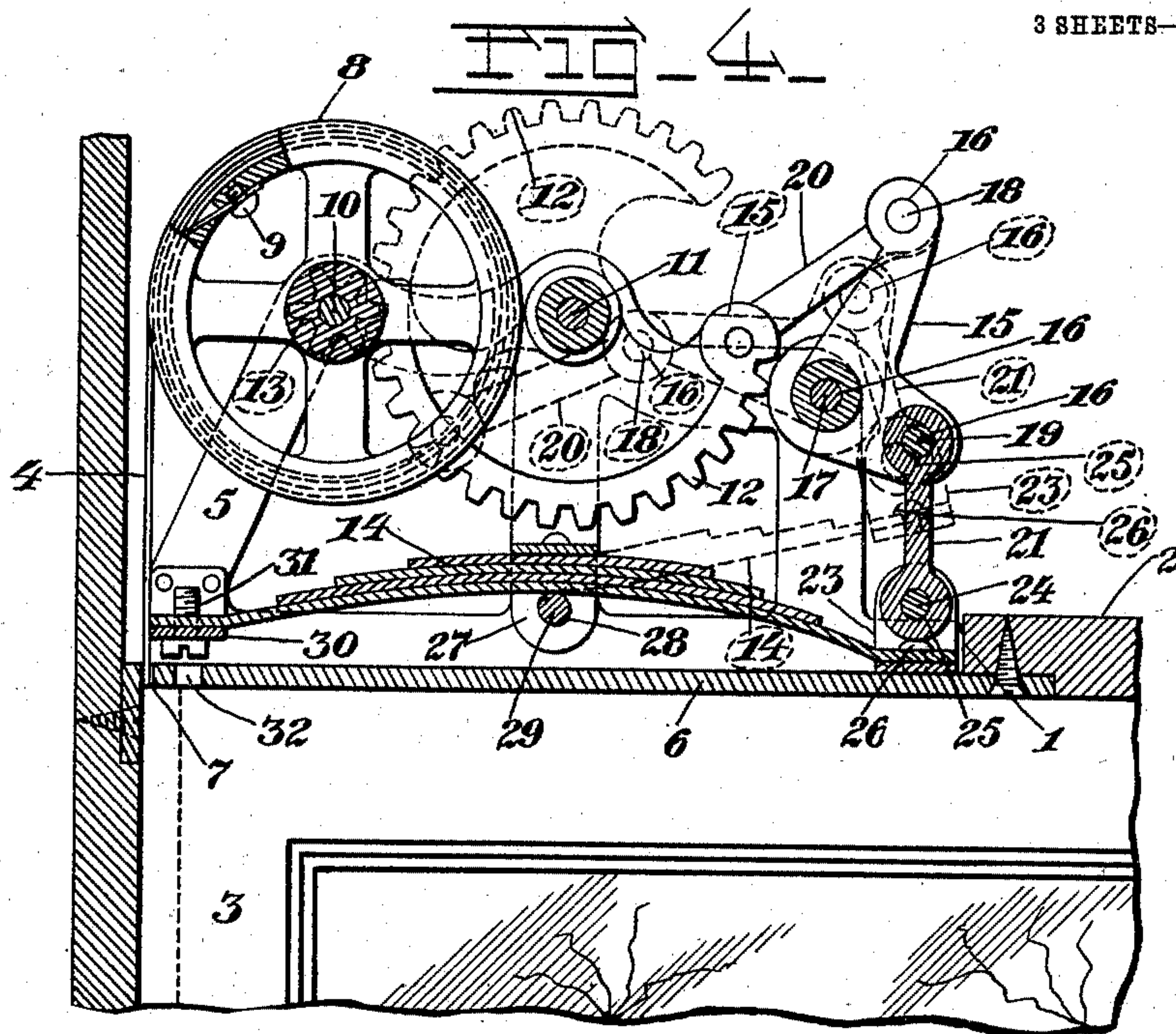


FIG. 5.

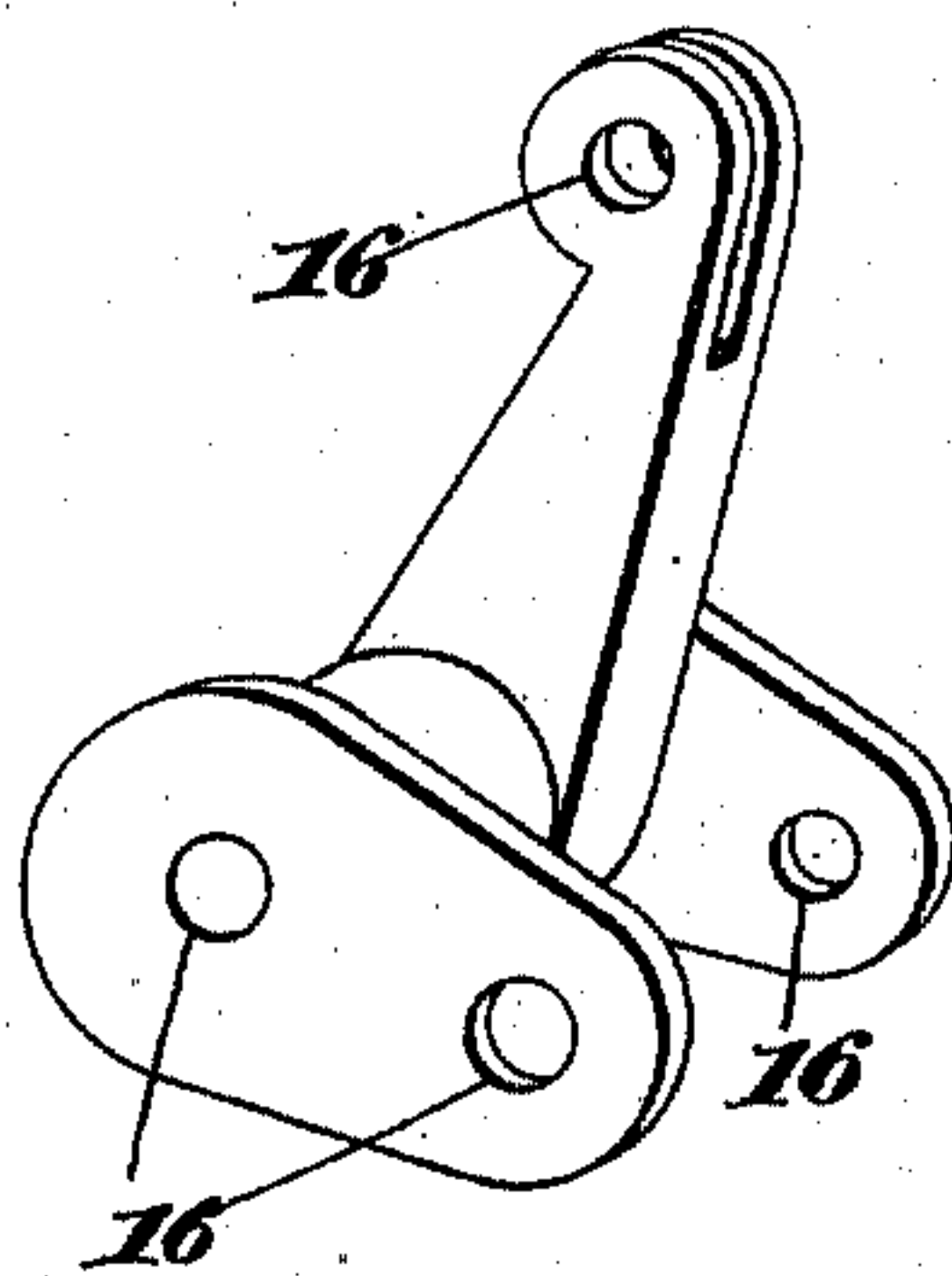
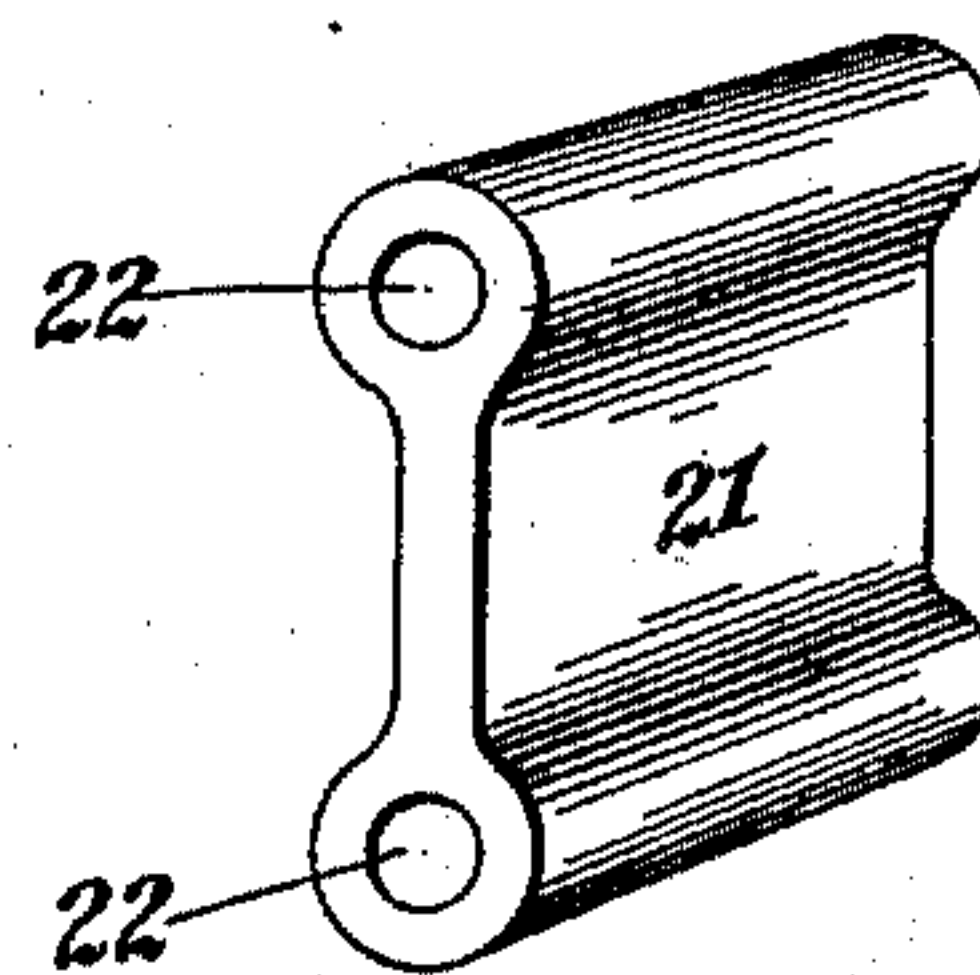


FIG. 6.



Witnesses:
Chas. A. Becker,
George L. Anderson.
Inventor:
William C. Stephen,
By Hugh N. Wagner,
His Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM C. STEPHEN, OF ST. LOUIS, MISSOURI.

WEIGHT-COMPENSATOR FOR WINDOWS, DOORS, AND THE LIKE.

965,763.

Specification of Letters Patent.

Patented July 26, 1910.

Application filed October 7, 1909. Serial No. 521,477.

To all whom it may concern:

Be it known that I, WILLIAM C. STEPHEN, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have
5 invented certain new and useful Improvements in Weight-Compensators for Windows, Doors, and the Like, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to improvements in weight compensators for use in connection with window-sash, sliding doors, stage-curtains, elevator gates, or any similar contrivance which must be balanced by a weight,
15 and has for its object to provide certain changes in the construction and arrangement of parts which simplify and improve the weight compensator constituting the subject-matter of my United States Letters Patent No. 875,963, granted January 7, 1908.

In the drawings forming part of this specification, in which like numbers of reference denote like parts wherever they occur, Figure 1 is a plan view of a window
25 equipped with the device; Fig. 2 is a sectional view on the line 2—2, Fig. 1; Fig. 3 is a sectional view on the line 3—3, Fig. 1; Fig. 4 is a sectional view, on an enlarged scale, on the line 4—4, Fig. 1; and Figs. 5
30 and 6 are detailed views of parts of the device.

Ordinarily the weight compensator is secured, as illustrated in the drawings, in an opening 1 in the top-rail 2 of the window-frame in which the sash slides but it may,
35 however, be located elsewhere as may be desired. To the stile 3 of the sash a sash-ribbon, -cord, or chain 4 is secured and connects the sash to the weight compensator.

40 When the device is connected to the top sash of a window the operating parts normally occupy the position depicted in Fig. 2, and when same is connected to the bottom sash said parts are normally in the position
45 shown in Fig. 3. The sides 5 to which the bottom 6 is secured support the operating parts therebetween. The sash-ribbon 4 passes through an opening 7 in the bottom 6 and is secured at one end to the grooved pulley 8 by the set-screw 9, or other suitable
50 means, said pulley being mounted on shaft 10, which is journaled in the sides 5. Supported between sides 5 is a shaft 11 upon which a segmental rack 12 is mounted, said
55 rack meshing with a pinion 13, secured to the hub of pulley 8. When the sash is raised

to the top of the casing, the segmental rack occupies the position depicted in full lines in Fig. 4, but as the sash is lowered the sash-ribbon 4 rotates pulley 8 and with it pinion
60 13 which causes segmental rack 12 to rotate to the position shown in dotted lines, such movement, however, being against the resistance of spring 14, as will presently be set forth, said spring tending, also, to cause the
65 parts to return automatically from the position shown in dotted lines to that indicated in full lines, or to assist in moving the sash in the opposite direction, or to balance the sash so that it will remain in any position to
70 which it may have been moved. A bell-crank lever 15 is journaled in the sides 5, said lever being preferably constructed as shown in Fig. 5 and having perforations 16 through which pintles 17, 18, and 19 pass.
75 A link 20, pivoted at one end to the segmental rack 12 and at the other end to the pintle 18, connects lever 15 and segmental rack 12, so that, as segmental rack 12 is rotated upon shaft 11, bell-crank 15 will simul-
80 taneously be swung about its axis 17. A plate 21, upon the ends of which are formed eyes 22, connects bell-crank 15 to stirrup 23, a pintle 19 being inserted through perforations 16 in the bell-crank 15, while a pintle
85 24 passes through the other eye 22 and perforations 25 in the stirrup, and as bell-crank 15 is rocked upon its axis, plate 21 will be moved vertically, such motion, of course, being communicated to stirrup 23.
90

One end of spring 14 seats in stirrup 23, being held therein by screws 26, and as stirrup 23 is moved vertically, said end of spring 14 is, likewise, raised or lowered. A yoke 27, through perforations 28 in which
95 pintle 29 passes, said pintle being inserted, also, through perforations in the sides 5, passes over spring 14 and limits the upward movement thereof. The other end of said spring is fastened to the cross-piece 30 by
100 the screw 31, said cross-piece being secured to the sides 5. An aperture 32 in bottom 6 permits the insertion of a tool to adjust the screw 31, which regulates the tension of spring 14. The aforementioned regulation
105 is due to the fact that the apertures in said cross piece and spring through which screw 31 passes are threaded, so that when said screw is turned in one direction the adjacent end of the spring will be caused to move
110 slightly upward, thereby increasing the pressure exerted by the opposite end of said

spring against the stirrup 23. When the screw is turned in the other direction, the adjacent end of the spring is lowered, in consequence whereof the pressure exerted against said stirrup by the opposite end of the spring is decreased.

The operation of the device is as follows: When the sash is lowered, sash-ribbon 4 rotates pulley 8 and with it pinion 13, which rotates segmental rack 12. By means of link 20, bell-crank 15, and plate 21, such motion of segmental rack 12 is communicated to stirrup 23, which moves upward against the pressure of spring 14. The tension of said spring is so regulated by screw 31 as exactly to counterbalance the weight of the sash, so that, as the sash is moved to any position, it will there be held by the spring 14. The sash may, accordingly, be raised and lowered at will, and will stay fixed in any desired position, since the spring 14 performs the same function as a counterweight.

I claim:

1. In combination with a member to be counterweighted, a plurality of standards, a pulley journaled in said standards, a pinion, a segmental rack journaled in said standards, a spring supported by said standards, a bell-crank, means connecting the segmental rack to the bell-crank, means connecting the bell-crank and the spring, and a tape attached at one end to the member to be counterweighted and at the other end to said pulley, said tape, upon motion of said member, communicating motion to said pulley and to said pinion thereby communicating motion to said segmental rack, said segmental rack being subject to the tension of said spring.

2. In a weight-compensator, the combination of a member to be counterweighted, a

pulley, means whereby movement of said member causes rotation of said pulley, a segmental rack, a pinion adapted to rotate with said pulley and to actuate said segmental rack, a bell-crank, a link connecting said bell-crank and said segmental rack, a spring, and means connecting said bell-crank and said spring.

3. In a device of the character described, the combination of a member to be counterweighted, a flexible means, rotating means actuated by said flexible means, a toothed member secured to said rotating means, a toothed member engaged with the first-named toothed member and actuated by the same, a yielding member, a pair of longitudinally movable members, one of which is connected to the second-named toothed member and the other to said yielding member, and a rocking connecting member intermediate said longitudinally movable members and having its ends pivoted to the adjacent ends of the same.

4. In a device of the character described, the combination of a member to be counterweighted, a pulley, a flexible connection between said pulley and said member, a toothed member secured to said pulley and rotatable therewith, a rocking toothed member engaged with and actuated by the first-named toothed member, a rocking lever, a yielding member, a connection between said rocking toothed member and said lever, and an additional connection between the latter and said yielding member.

In testimony whereof I have affixed my signature in presence of two witnesses.

WILLIAM C. STEPHEN.

Witnesses:

GLADYS WALTON,
SUE HILL.