

E. M. ERB.  
ADJUSTABLE SASH BALANCE.  
APPLICATION FILED JULY 11, 1906.

928,644.

Patented July 20, 1909.

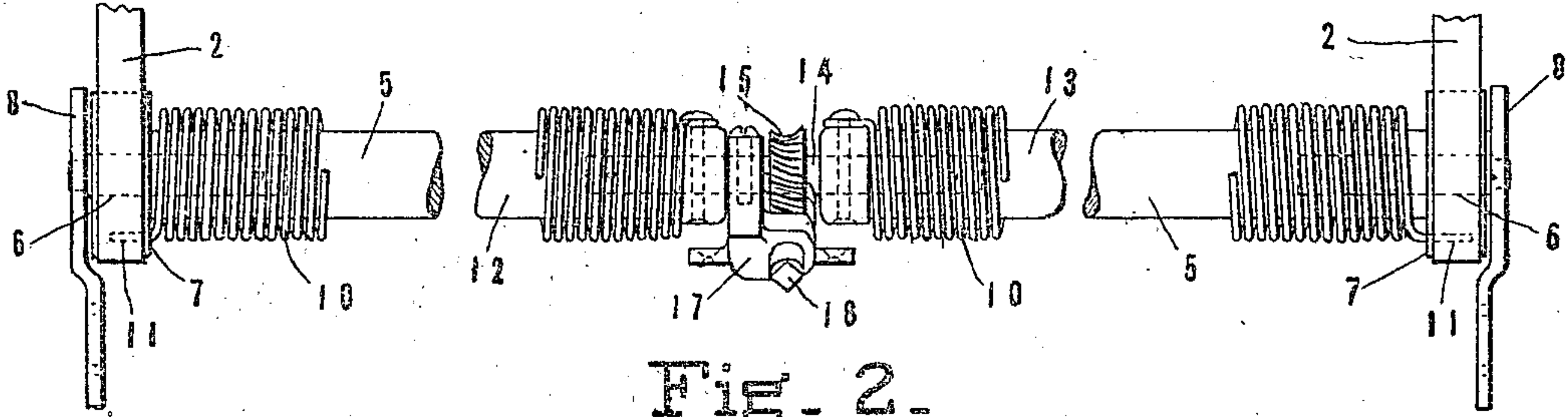


Fig. 2.

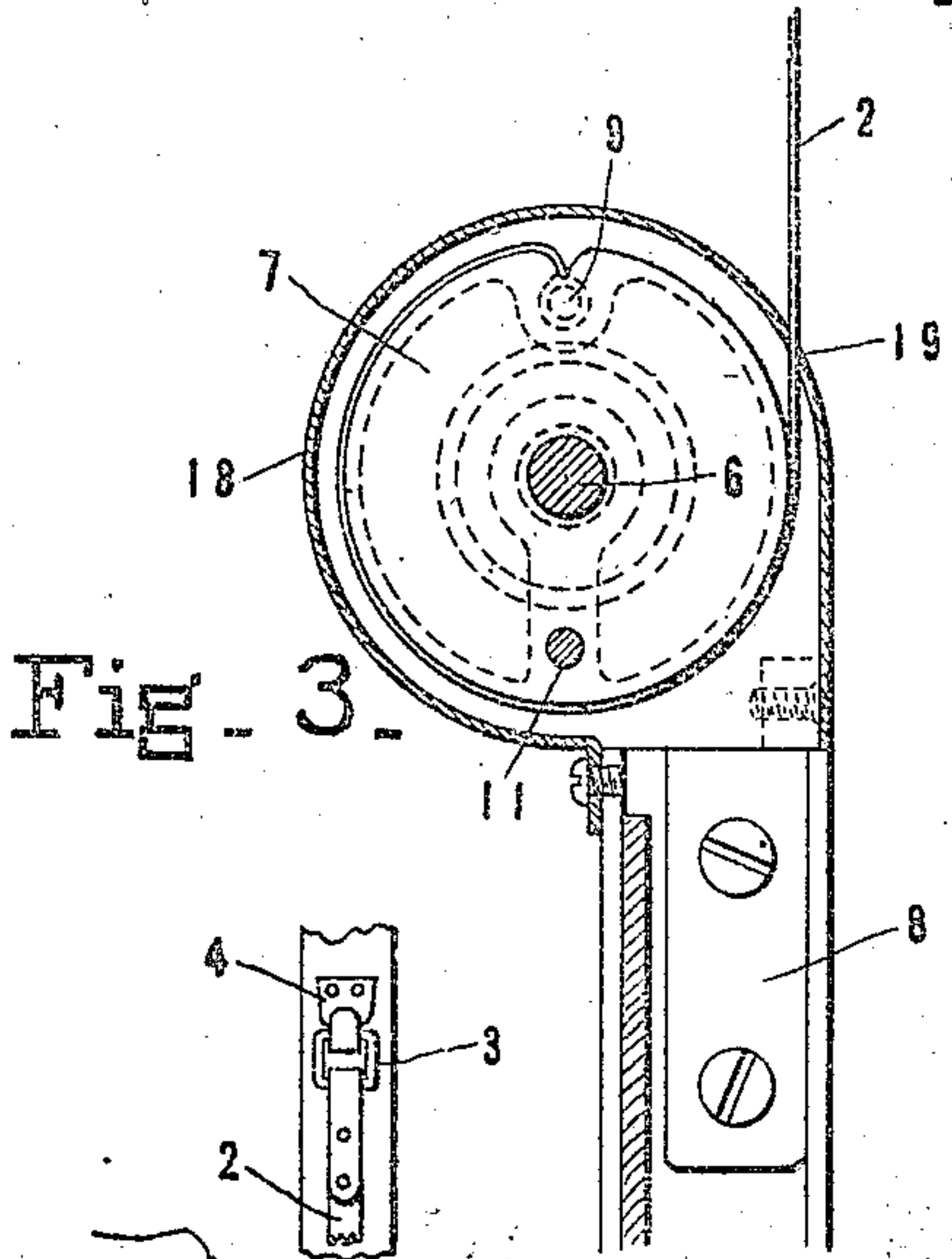


Fig. 3.

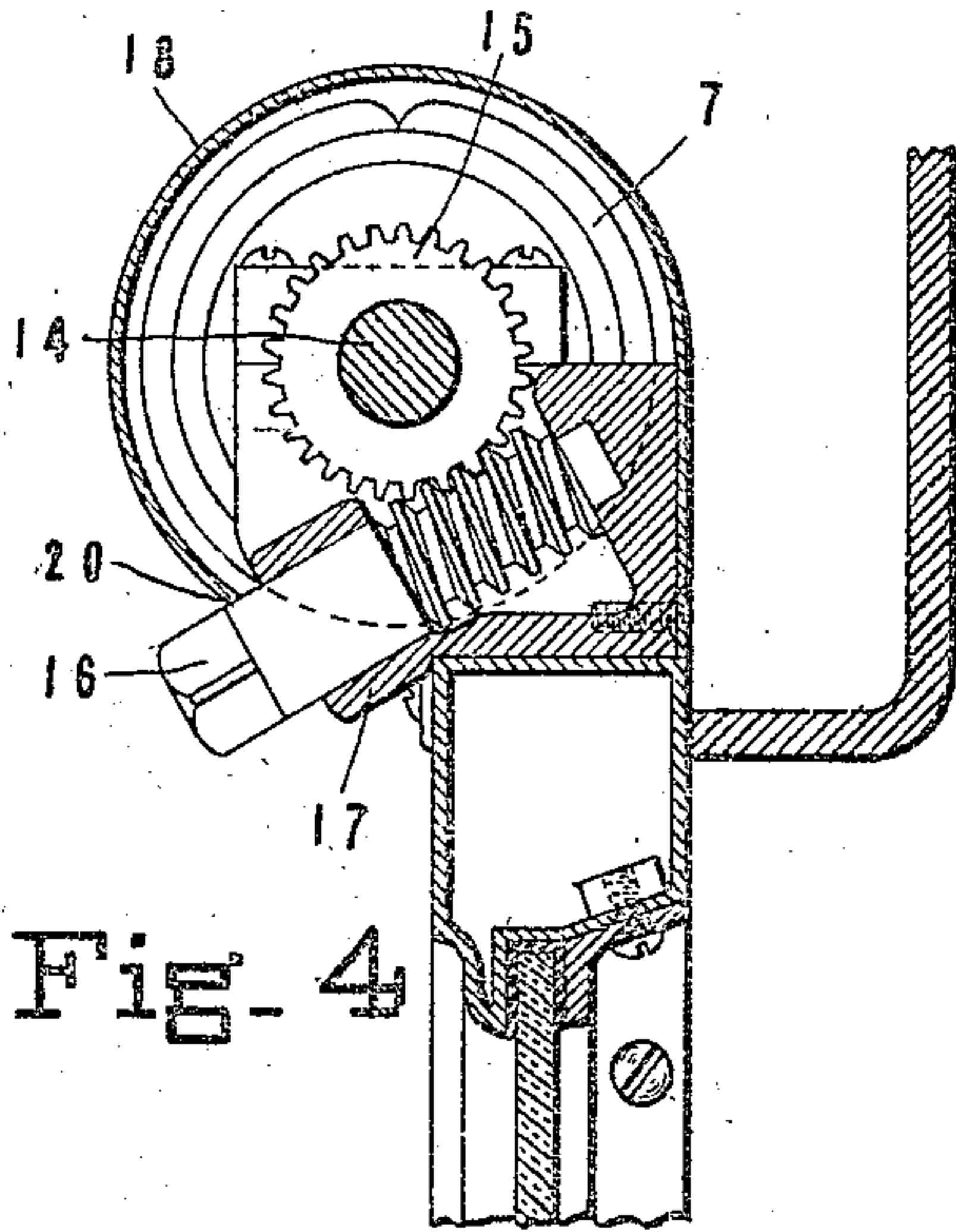


Fig. 4.

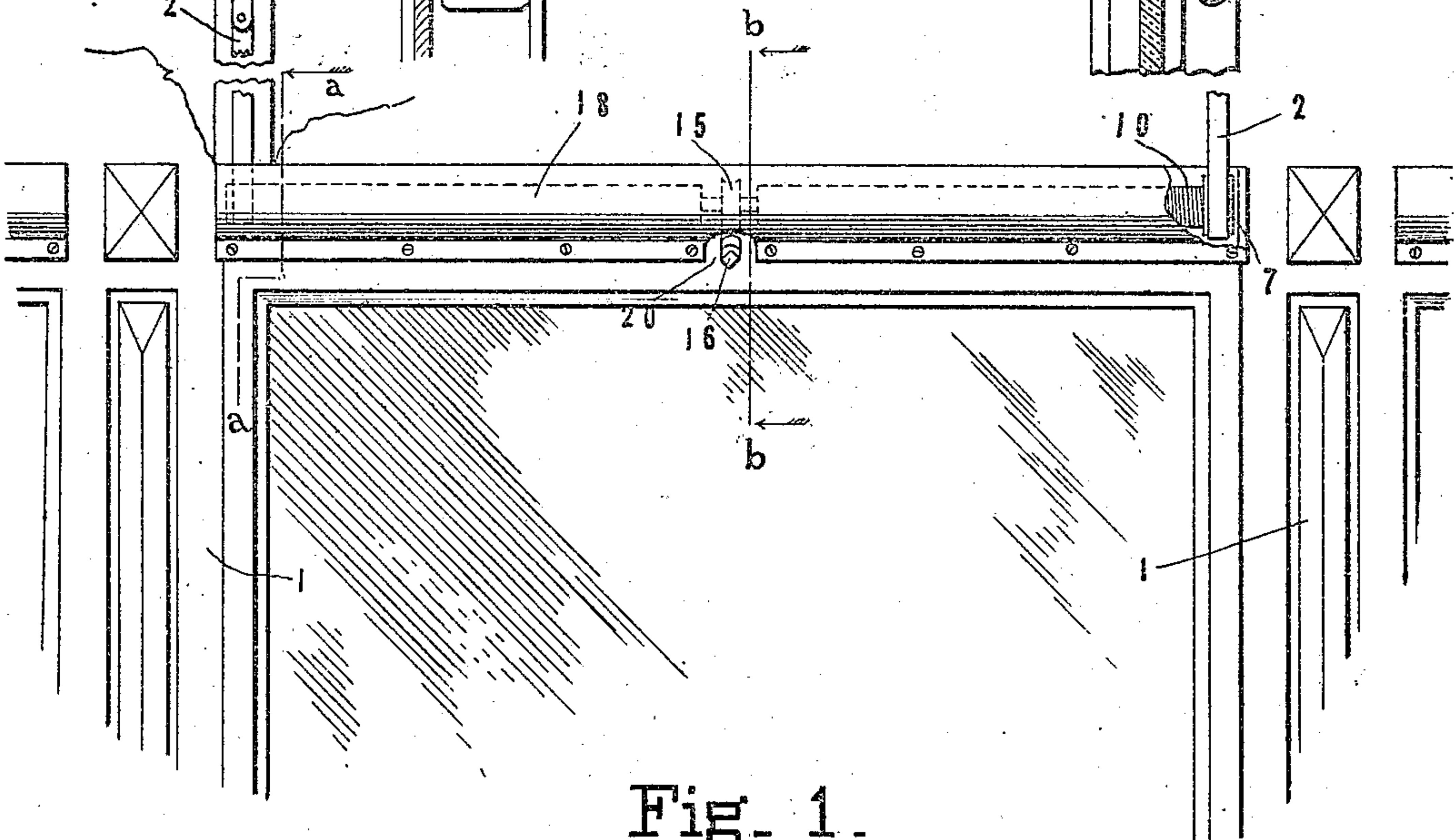


Fig. 1.

WITNESSES

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# UNITED STATES PATENT OFFICE.

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## ADJUSTABLE SASH-BALANCE.

No. 928,644.

Specification of Letters Patent.

Patented July 20, 1909.

Application filed July 11, 1906. Serial No. 325,560.

*To all whom it may concern:*

Be it known that I, EDMUND M. ERB, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Adjustable Sash-Balances, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates broadly to sash balances, but more particularly it concerns improvements in devices of this character adapted to be used in railway cars or similar structures.

One of the objects of this invention is to provide a sash balance for sliding window sashes, whereby the supporting power thereof may be easily varied or adjusted to any desired degree of nicety.

Another object thereof is to provide the same easily accessible to the sash balancing means, whereby it may be more readily adjusted, repaired or replaced than has been possible with sash balances as heretofore constructed.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of constructions, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter described and the scope of the application of which will be indicated in the following claims.

In the accompanying drawing, wherein is shown one of the various possible embodiments of my invention, Figure 1 is a view in elevation of a portion of a window sash with my invention applied thereto; Fig. 2 is a similar view of the sash balance with the inclosing casing removed; Fig. 3 is a sectional view thereof taken on the line *a-a*, Fig. 1; Fig. 4 is a similar view taken on line *b-b*, Fig. 1.

Similar reference characters refer to similar parts throughout the several views of the drawing.

In order that the more important objects sought to be attained by my invention may be more readily understood, it may here be noted that considerable difficulty has been

encountered in adjusting the springs and in repairing or replacing the operative parts of sash balances as hitherto constructed, and such difficulty is heightened in railway cars or other structures of a like nature, due mainly to the closed-in construction of the walls thereof. In eliminating this difficulty and realizing other important advantages, I have found it desirable to mount the sash balancing devices directly upon the sliding sash, and it will be apparent from the following description which deals more specifically with the several co-acting elements constituting my invention that I have attained, among others, all of the above enumerated objects through the provision of an exceedingly simple and efficient construction.

Referring now to the drawing, wherein I have shown a preferred adaptation of my invention designed to be used in connection with railway cars or the like, 1 denotes a portion of the framework of the window within which the sash is mounted to slide, the same when slid upward being received in the space provided between the inner and outer walls of the car. The sash is suspended in the frame by means of thin, flexible bands 2, preferably of metal, although chains or cords may be employed in this connection, if desired, said bands being provided at their upper ends with hooks or links 3 adapted to be detachably secured to the frame as by being positioned over a hook or other projecting device as at 4, which extends upwardly from the front or rear guiding stop for the sliding sash.

Journaled in suitable bearings provided upon the top rear portion of the sash is an arbor 5, said arbor extending substantially across the entire width of the sash, and upon pins 6 extending outwardly from said arbor at its opposite ends are journaled drums 7. The outer ends of pins 6 are shown as received in brackets 8, which are secured to the side stiles of the sash, said pins being thereby held rigidly in position. Drums 7 are provided with smooth circular peripheries, around which ride the suspending bands or straps 2 which are suitably attached thereto as by means of studs 9. To balance the sash in the frame, coil springs 10 are provided, said springs being each



coiled about arbor 5 and attached at one end thereto, with their opposite ends attached to said drums as at 11. Arbor 5, in the present instance, is constituted by two sections, 12 and 13, held rigidly against relative rotative movement by means of pins 14 extending laterally in opposite directions from a worm-wheel 15, said pins being rigidly secured to the adjoining ends of the sections of the arbor.

In order to vary the tension of springs 10, which, as it will be seen, can be accomplished by a rotation of said arbor, a screw 16 is rotatively journaled in a bracket 17 carried upon the sash, said bracket holding the screw against end thrust. This screw is provided preferably with a squared head, enabling it to be engaged by a wrench or suitable turning device, and it has threads which mesh with those of worm-wheel 15, so that by a rotation thereof said worm-wheel will operate to rotate the arbor, thereby regulating the tension of the springs, the engagement of the threads of the worm-wheel with those of the screw preventing a reverse rotation of the worm-wheel, and serving to maintain the arbor in any adjusted position.

In order that the several operative parts as above described which constitute the sash balance may be protected against dirt or injury, a casing 18 is provided which extends inwardly about the same, said casing being cut away as at 19 to afford a passage-way for the suspending means and as at 20 to provide an aperture through which extends the squared head of the adjusting screw.

It will be obvious from the foregoing that a revolution of worm-wheel 15 will, to a corresponding extent, vary the tension of the springs 10, thereby adjustably opposing the pull on the sash supporting connection; and at this point it may be noted that I preferably over-balance the sash so that when the same is released from the frame it will move upward to any desired extent. It will also be noted that, inasmuch as each of the suspending means is independent of the other, a breakage of one will in no way interfere with the operation of the other, which may be quickly adjusted to any desired tension and thus operate singly until such breakage has been repaired. In the event of the breakage or other disarrangement of the sash balance, the whole device may be removed from the frame with the sash by merely unhooking the upper ends of the suspending bands or straps from the devices with which they are connected, or, if desired, the suspending means may be detached from the drums.

While in this illustrative embodiment of my invention I have shown the sash balanc-

ing means mounted upon the upper portion of the sash, I wish it to be understood that I do not intend to limit myself to this precise construction, as in some cases I shall mount the said balancing means upon other portions of the sash, as, for instance, upon the lower portion thereof; or, if desired, I may mount the same in any portion of the side stiles thereof, with such other structural changes as clearly fall within the scope of my invention. It will accordingly be apparent that I have provided a construction which possesses not only great simplicity and compactness, but is also readily accessible for purposes of adjustment or repair, which, as above explained, may be readily effected by simply removing the sash from the frame.

As many changes could be made in the above construction and many apparently widely different embodiments of my invention could be made without departing from the scope thereof, I intend that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. I desire it also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention hereindescribed and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a window construction, in combination, a sliding sash, suspending means therefor secured at one end to the frame, an arbor journaled along the upper edge of said sash, a plurality of drums mounted on said arbor about which the suspending means are wound, a plurality of springs each of which is connected with the arbor and one of said drums, and means for adjusting the tension of the springs.

2. In window construction, in combination, a sliding sash, suspending means therefor, a plurality of drums mounted upon the sash about which are wound said suspending means, an arbor journaled upon said sash at either end of which is rotatively mounted one of said drums, a plurality of springs located upon said arbor each of which is connected therewith and has its other end attached to one of said drums, and common means for adjusting the tension of said springs.

3. In window construction, in combination, a sliding sash, suspending means therefor, a plurality of drums about which are wound said suspending means, an arbor rotatively supported upon said sash and having at either end thereof journals upon

which said drums are rotatively mounted, a plurality of springs each of which is connected at one end to said arbor and has its opposite end connected to one of said drums,  
5 a worm-wheel carried by said arbor, and a screw for rotating said worm-wheel to adjust the tension of said spring.

In testimony whereof I affix my signature, in the presence of two witnesses.

E. M. ERB.

Witnesses:

C. H. WILSON,  
ALBERT NATHAN.