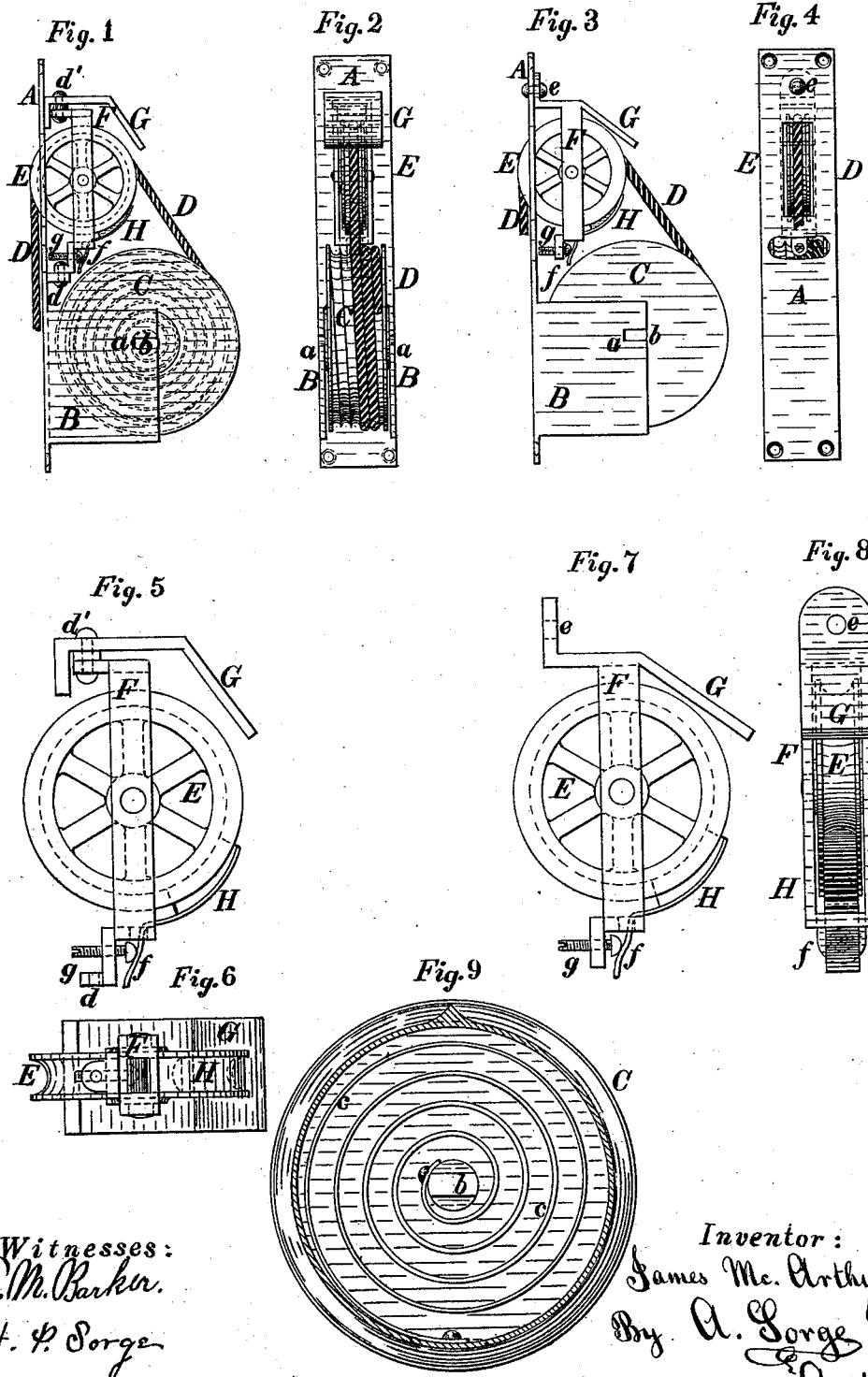


(No Model.)

J. McARTHUR.  
SASH BALANCE.

No. 418,811.

Patented Jan. 7, 1890.



Witnesses:  
A. M. Barker.  
H. P. Sarge

Inventor:  
James Mc. Arthur  
By A. Sarge Jr.  
Att'y.

# UNITED STATES PATENT OFFICE.

JAMES MCARTHUR, OF ROCHESTER, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO JOHN W. MARTIN, ALLEN R. SHEFFER, RINALDO S. KENYON, TRUSTEE, AND ADOLPH SORGE, JR., ALL OF SAME PLACE.

## SASH-BALANCE.

SPECIFICATION forming part of Letters Patent No. 418,811, dated January 7, 1890.

Application filed May 21, 1889. Serial No. 311,566. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES MCARTHUR, of Rochester, in the county of Monroe and State of New York, have invented a new and useful Improvement in Sash-Balances, of which the following is a specification, with the accompanying drawings, and the novel features set forth in the claims annexed to the specification.

My invention relates to that class of sash-balances in which the sash is suspended from a rope or cable and in which the tension of a spring replaces the weights commonly used; and my improvements consist, mainly, in using an auxiliary guide-pulley, over which the rope or cable passes in placing the brake, so as to act upon the auxiliary pulley, and in providing a guard for protecting the rope or cable passing over said pulley.

In the drawings, Figure 1 is a side elevation, and Fig. 2 a rear view, of one form of my device. Figs. 3 and 4 are respectively a side elevation and front view of another form of my device. Figs. 5 and 6 are respectively a side elevation and an end view of the guide-pulley and frame used in Figs. 1 and 2. Figs. 7 and 8 are respectively a side elevation and top view of the guide-pulley and frame used in Figs. 3 and 4. Fig. 9 is a sectional view of the drum and spring used in my device.

A is the face-plate of my sash-balance, to which all the other parts are attached, and which is let into the window-frame so that its outer surface is flush with the face of the frame, and then secured in position by screws or nails through the holes provided in the face-plate for that purpose. Projecting up from the back of the face-plate are the two side pieces B B, provided with the notches *a*. Into these notches fit the ends *b* of the shaft, upon which the drum C revolves freely. This drum contains a spiral spring *c c*, of ordinary construction, which is held securely on the shaft at one end and on the inside of the drum at the other by any of the usual devices. There are two flanges projecting from the sides of the drum, and its surface may be left smooth or may have a continuous groove formed in it, in which the cable or

rope can run. One end of the cable D is securely attached near one of the flanges to the surface of the drum and then winds around the drum, passing thence over the swinging guide-pulley E, and having its other end attached to the sash by any of the ordinary means. The pulley E projects beyond the surface of the plate A through a suitable slot provided in said plate and to such a distance as to allow the cable D to clear the surface of plate A. This pulley is placed on a shaft which is mounted in the frame F, and this frame is so held as to be able to swing, in order to accommodate the cable which unwinds from the drum at continuously-varying angles, while keeping its direction and location substantially constant after leaving the pulley E. This swinging of the frame F, and thereby of the pulley E, may be accomplished in a number of different manners; but I have only illustrated the two constructions which I prefer.

In Figs. 1, 2, 5, and 6, F is the frame carrying the pulley E. At its upper end it has a projecting lug. A guard G, so shaped as to cover the portion of the cable D on the guide-pulley, is securely attached to the back of the face-plate A, and has a pin *d'* passing through it and the upper lug of the frame F. At its lower end the frame F has another lug projecting from it, which is held to a corresponding lug on the back of plate A by a pin *d*. These two pins *d d'* are located in line with each other and close to the back of face-plate A, thus enabling the frame F to swing around them in a plane at right angles to the surface of plate A.

In Figs. 3, 4, 7, and 8 the frame F has the guard G attached to it and projecting beyond the pulley E at one end, while a lug is formed at the same end parallel with the face of the plate A, to which it is held by the pin *e*, passing through the plate and the lug. In this case the frame swings in a plane parallel to the surface of plate A around the pin *e*.

It is frequently desirable to vary the tension or draft of the cable D on the sash to which it is attached, and I accomplish this by employing an adjustable brake to act upon

the pulley E. This brake may be applied in various manners; but I have only illustrated the one I prefer, in which the pressure is applied to the surface of the pulley E by the brake II. In this preferred construction the brake-shoe is carried on a strap of metal, which is bent near its lower end so as to pass through a slot provided in the end of frame F, and which has the portion *f* projecting beyond this slot. The head of the screw *g* bears against this portion *f*, and is screwed into a projection from the frame F, the end of the threaded part being slotted. By screwing this screw farther in, the head presses the portion *f* of the brake-strap outward, thereby crowding the shoe harder against the pulley, the fulcrum being in the end of the frame F. By placing the head of the screw between the portion *f* of the brake-strap and the projection from the frame F the adjusting-screw is securely retained in place and cannot be lost out accidentally. A slot is provided in the frame A opposite the end of screw *g*, so as to enable an adjustment of the brake-pressure without disturbing the position of the device.

Other modifications in the construction of this device may be employed, such as altering the position of the brake to the upper end of frame F and allowing the cable to pass under pulley E instead of over it; but I have not illustrated these modifications, as they involve no new features, and I prefer the constructions shown.

I claim—

1. In a sash-balance, the combination of a face-plate A with the spring-drum C, holding the cable D, and a swinging guide-pulley E, over which the cable passes, substantially as described.
2. In a sash-balance, the combination of a face-plate A with spring-drum C, holding the

cable D, a swinging guide-pulley E, over which the cable passes, and a brake II, operating on the guide-pulley, substantially as described.

3. In a sash-balance, the combination of a face-plate A with spring-drum C, holding the cable D, a swinging guide-pulley E, over which the cable passes, a brake II, operating on the guide-pulley E, and a guard G to protect the cable, substantially as described.

4. In a sash-balance, the combination of a face-plate A with spring-drum C, holding the cable D, a swinging guide-pulley E, over which the cable passes, and an adjustable brake II, operating on the guide-pulley, with an adjusting-screw *g*, bearing on the prolongation *f* of the brake-strap, substantially as described.

5. In a sash-balance, the combination of a face-plate A, the spring-drum C, holding the cable D, and guide-pulley E, over which the cable passes, together with a frame holding said guide-pulley and swinging in a plane at right angles to the face-plate, substantially as described.

6. In a sash-balance, the combination of a spring-drum holding the cable, a guide-pulley over which the cable passes, a brake operating upon said guide-pulley, and an adjusting-screw for increasing or diminishing the pressure of said brake, substantially as described.

7. In a sash-balance, the combination of a face-plate A and a grooved spring-drum C, to which the cable D is attached, and having said cable run in the grooves of said drum, with a guide-pulley E, over which said cable passes, and a brake operating upon said guide-pulley, substantially as described.

JAMES McARTHUR.

Witnesses:

A. SORGE, Jr.,  
CLINTON PATCHIN.