R. G. Kimball.

Lever Balance.

No. 94,765. Patented Sept. 14, 1869.

Fig. 1.

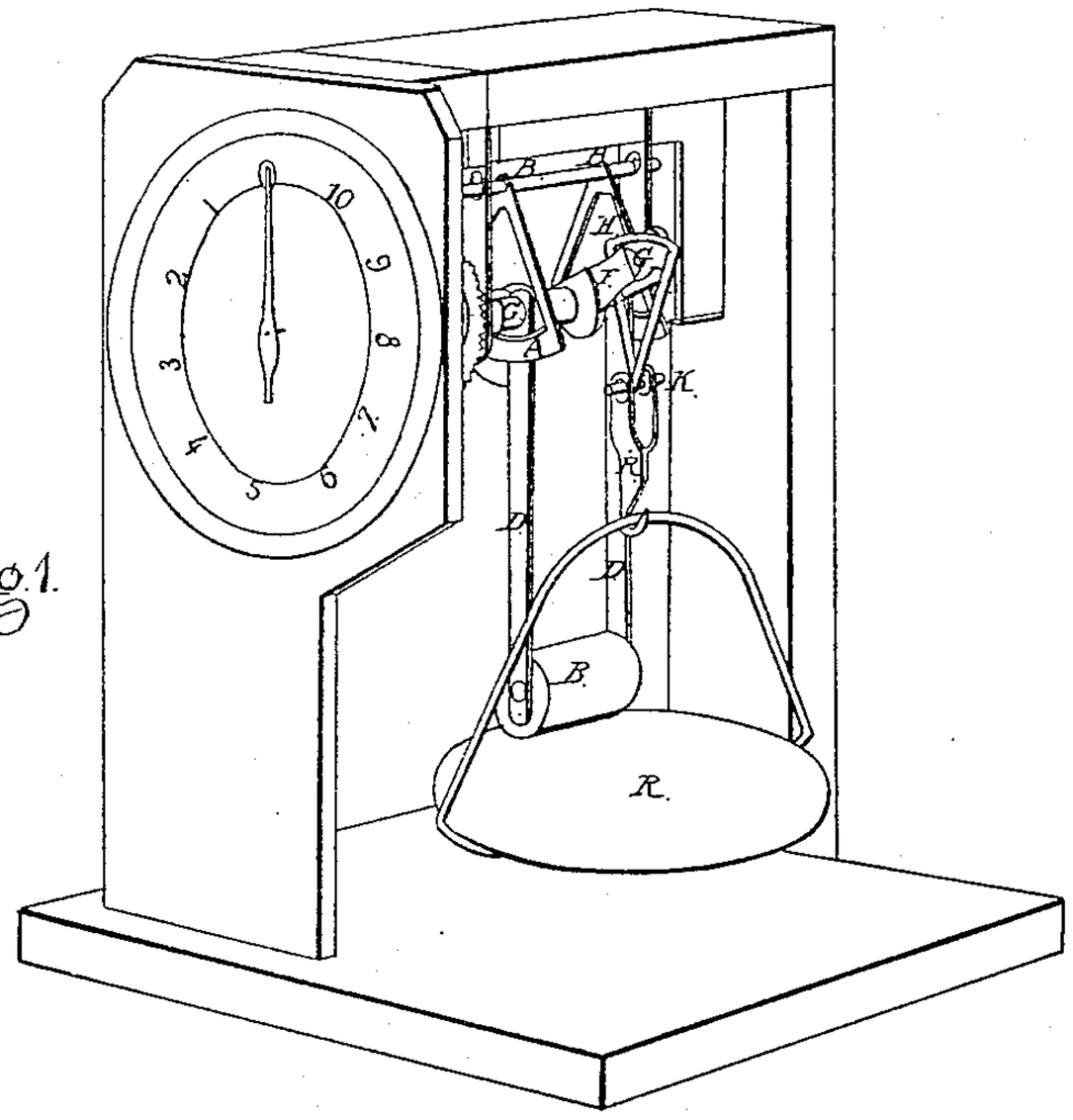


Fig. 2.

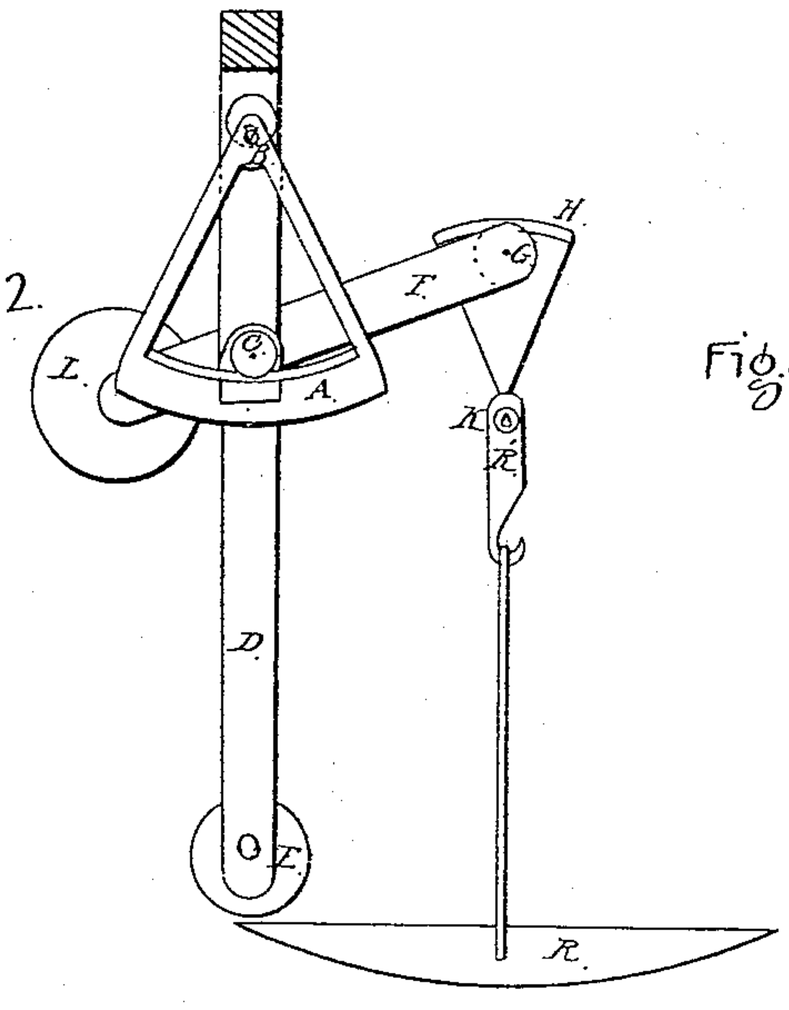
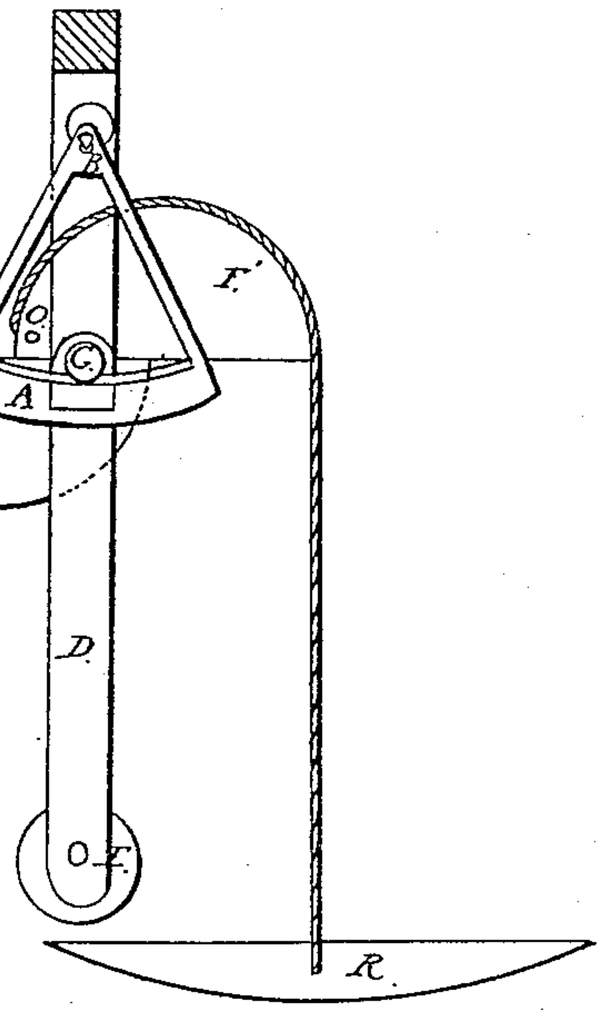


Fig. 3.



Witnesses:

Robt. J. Hillon Jr.

Charles Huron

Inventor:

Rodney G. Kimball

United States Patent Office.

RODNEY G. KIMBALL, OF ALBANY, NEW YORK.

Letters Patent No. 94,755, *dated September* 14, 1869.

IMPROVEMENT IN BENT-LEVER BALANCES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, RODNEY G. KIMBALL, of the city and county of Albany, and State of New York, have invented a new and useful Improvement in Bent-Lever Balances; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming a part of this specification.

My improvement consists in part in the combination and use of rolling fulcra, in combination with knife-edged fulcra, in the construction of bent-lever balances.

In the accompanying drawing—

Figure 1 represents a bent-lever balance, containing my said improvement.

Figure 2 is a representation of the said levers and their respective fulcra, both rolling and knife-edged.

In fig. 2, the knife-edged fulcra are seen at B and K, and the rolling fulcra are seen at C and G.

The object sought to be accomplished in the combination of these two fulcra in the construction of the bent-lever balance, is to secure strength, avoid friction, and obtain uniformity of motion in marking the weight of objects.

The operation of this balance is as follows:

When an object is placed in the scales at R, its gravity tends to carry down the scale-plate R, thereby depressing the end of the lever F at G, and elevating the end of the lever D at E.

The levers D and E are made fast to the round shaft C, constituting, in effect, a single bent lever.

The round shaft C is supported by the quadrants A B A B, upon which quadrants the ends of the shafts act as rolling fulcra.

The round shaft C is kept steady in its place by means of small wires, extending from the axis of the shaft at each end, passing through stationary framework constructed for such purpose.

As the scale-plate R descends, the ends of the shaft C resting upon the inner arc of the quadrant revolve toward A, in fig. 2, carrying the quadrant to the left.

This quadrant is suspended from a rod standing upon a knife-edged fulcrum in the top of the frame, as seen at B B, in fig. 1, so that, when the quadrant swings to the left, by the action already described, it swings upon such knife-edged fulcrum.

The balance-plate R, in figs. 1, 2 and 3, is attached to the end of the rod F by means of the quadrant H, in figs. 1 and 2, and the connecting-hook R′, and the bail of the balance-plate, as shown in said figure.

In the apex of the quadrant, a knife-edged fulcrum is attached, to sustain the hook and the balance-plate, and to enable it to oscillate with freedom, which is further aided by means of the rolling fulcrum G, over which the quadrant H turns.

By these means I am enabled to secure a very perfect use of the edge of the fulcrum K at every position of the rod F.

In fig. 1, I have represented, in connection with the operation of my said balance, a mode of recording the weight of objects, by means of a dial-plate graduated to express pounds by means of an index, or pointer. In fig. 1, such dial-plate represents a scale of ten pounds to a complete revolution of the pointer. The motion communicated to the rod C is that which is used to turn the index. This may be accomplished by any suitable mechanical device.

Fig. 3 is another form of constructing the bent lever, and of attaching the balance-plate thereto. This mode of construction of the bent lever is suited to balances designed for light weights, and is an excellent arrangement for equalizing the motion of the balance-plate and index-pointer.

The mode of constructing this form of the bent lever, as shown in fig. 3, is as follows:

A circular disk is constructed, by any of the means well known. A hole is drilled through the disk, of a size to fit the rod to pass through the same, as C, in the figure. This hole is drilled eccentric, at any desired distance from the centre. The disk is then to be divided into two equal parts, the division passing through the centre of the disk, and the centre of the hole drilled through the same. Then, reversing these halves of the disk, make them fast to the rod C, as shown in fig. 3. In this arrangement they represent the levers F and L, in figs. 1 and 2.

The balance-plate R is attached to the semi-circular plate F′ by means of a cord, as represented in fig. 3.

Having thus fully described my said invention, I will state my claim:

The levers D and F, in combination with the shaft C, quadrants A A and H, and hook R′, substantially as and for the purpose set forth.

RODNEY G. KIMBALL.

Witnesses:

JOEL TIFFANY,

ROBT. J. HILTON, Jr.