(No Model.)

W. C. THOMSON.

WEIGHING SCALE.

No. 376,925. Patented Jan. 24, 1888.

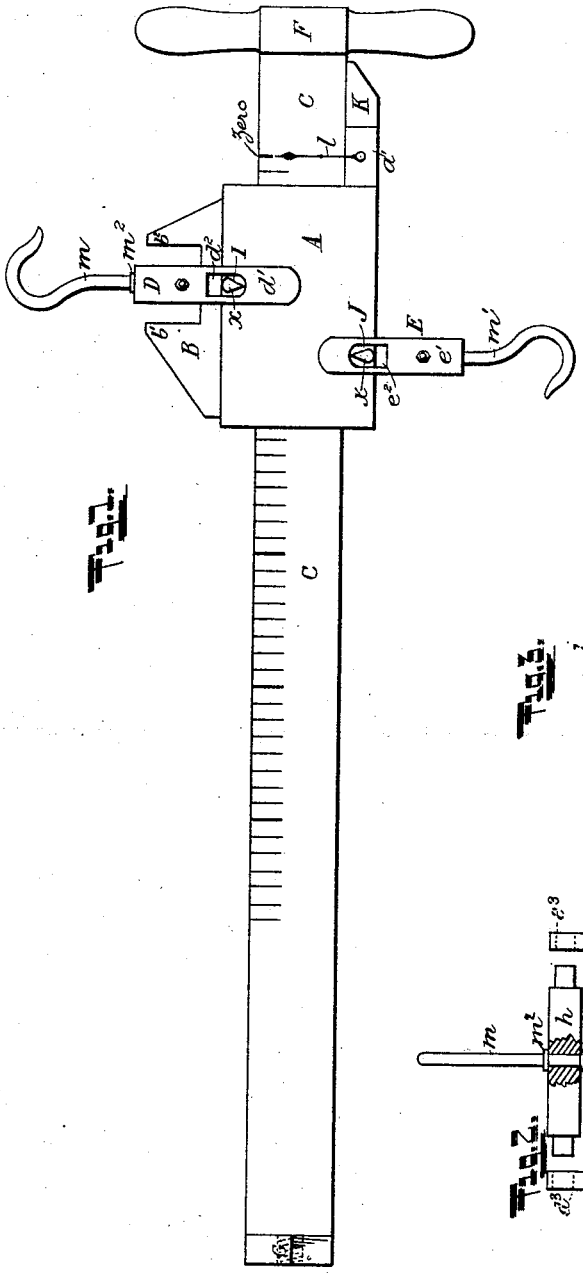

Fig. 1.

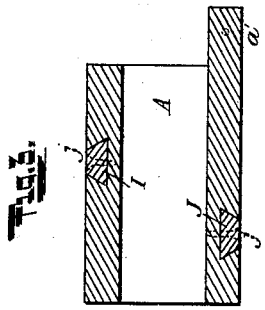

Fig. 3.

Fig. 2.

Witnesses
Will T. Norton
A. B. Rawlings

Inventor
Waddy C. Thomson

By his Attorneys
John J. Halsted & Son

UNITED STATES PATENT OFFICE.

WADDY C. THOMSON, OF CAMDEN, SOUTH CAROLINA.

WEIGHING-SCALE.

SPECIFICATION forming part of Letters Patent No. 376,925, dated January 24, 1888.

Application filed May 25, 1887. Serial No. 239,339. (No model.)

To all whom it may concern:

Be it known that I, WADDY C. THOMSON, of Camden, in the county of Kershaw and State of South Carolina, have invented certain new and useful Improvements in Weighing-Scales; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of my invention is to furnish a weighing apparatus of great efficiency and capacity with but few parts and of economical construction.

The invention will be clearly understood from the following description.

In the drawings, Figure 1 shows an apparatus in elevation embodying the principles of my invention, and serving to illustrate it. Fig. 2 shows the portions of one of the hangers detached; and Fig. 3 shows a longitudinal central section of the box A, with the dovetailed cross-bars I and J.

I would premise that, unlike most scales or steelyards, the scale-beam in my improved constructions has no fixed or unchanging fulcrum-point; but, on the contrary, it is arranged to slide or shift in an appropriate suspended piece or box, so that at every sliding or shifting of the same one end of the beam shall project more while the other end shall project correspondingly less beyond the point of suspension; and another peculiarity is that the weight by which is to be ascertained the weight of the article being weighed is not only a constant, but is permanently fastened to one end of the sliding beam. Thus no removable weights or set of weights are required or used, and there is no possibility therefore of the single weight employed becoming either lost or mislaid.

A represents a box open at both ends, and in which snugly fits a slide beam or bar, C.

B is a buffer or stop-piece on top of the box, D a hanger by which the whole apparatus is suspended when being used, and E a similar hanger pendent from the box and serving to hold the articles to be weighed.

F is a fixed and predetermined weight permanently fastened to one extremity of the sliding beam C, and G is a light weight fastened on its other extremity. Each of these weights also performs another duty of preventing the beam from accidentally sliding entirely out of the supporting-box. Cross-pieces *h* connect together the side pieces, *d'* and *e'*, of the hangers D and E.

I and J, respectively, are bars for sustaining the hangers and for affording edges by which the apparatus can be properly balanced while weighing.

K is a fixed stop or buffer on the under side of the slide-beam and near the larger weight, F, and *a'* is a projecting portion of the bottom of the box extending in a direction toward the buffer K, and serving to limit the sliding movement of the beam C when moved to the left, so that when K and *a'* are in contact the scale-beam shall be in equilibrio, or hang at a level, when no object is being weighed. This projection *a'* also affords a means for attaching thereto one or more fixed indices or pointers, *l*, and which, when the parts *a'* and K are in contact will indicate the zero-point of the graduated scale on the beam; and it also affords ample room for convenient handling and pushing in or pulling out the beam without cramping the fingers, and without risk of disturbing the pointer or pointers, while at the same time distinctly exposing the zero-point to view.

The bars I J, excepting at their projecting extremities, are made dovetailed or triangular in cross section, as shown, and are inserted lengthwise—that is, are pushed in endwise into correspondingly-shaped grooves made, respectively, in the top and bottom of the box at appropriate places therein. Their form thus prevents their being pulled out by any downward strain or stress of the articles being weighed, inasmuch as the width of the groove is materially less at its mouth than at its opposite side or base. These bars I prefer to make of steel or hardened steel, while the box itself may be made of any suitable metal or other material. In some cases, if desired, the bars I J and their corresponding grooves in the box may be dispensed with, and instead the projecting extremities *x* for the hangers may be made integral with the box or cast in one with it.

When made separately and inserted in the grooves, the bars I J are secured in position by screws *j* or any other suitable fastenings.

The buffer B may, if desired, be made separately from and then fastened on top of the box, or it may be cast or made integral with it and with the bottom projection, *a'*. It is formed with a recess or open space in its top, as shown, of such depth that its parts *b'* and b^2 at the sides of this recess will arrest and limit the downward swing or tilting of the beam and box by bringing one of these parts *b'* and b^2 into contact with the cross-piece of the upper hanger, D.

In the normal position of the parts, the slide-beam being pushed to the left as far as it can go, the pointer indicates zero, the beam hangs horizontally, and the tips of the parts *b'* and b^2 are equidistant from the cross-piece *h* of hanger D.

I prefer to make the hangers D and E each of three pieces, namely: of two side pieces (marked in Fig. 2 as *d'*, those of E being marked *e'*) and of the already-named cross-piece *h*, and each of these side pieces has at its free end a slot or opening, d^2 or e^2, respectively, to receive the bearing ends of the cross-pieces I and J, and the bearing parts of these slots should be curved or rounded, that the apparatus may always hang correctly with respect to these hangers. These side pieces, *d'* and *e'*, respectively, are preferably provided with small holes d^4 to receive a shouldered rod, *p*, screw-threaded at each end for connecting together these three pieces, nuts being applied to the threads of the rod, and they are also preferably made with slots or mortises d^3 and e^3, into which the ends of the cross-piece *h* enter.

The poise F is designedly so shaped as to project both above and below or at opposite sides of the slide-beam to which it is affixed. It thus affords a handle easily grasped whereby the beam may be pushed in or pulled out of its box or support.

The projection *a'* on the box, besides serving as a stop and as a means for attaching an index hand or pointer, also performs another important duty, to wit: it forms a continuation of the lower bed or support on which the sliding beam rests and moves, and consequently materially contributes to keeping the beam in its proper normal position parallel with the bore of the box, and thus preventing its being tilted relatively thereto, and thereby binding against the upper edge of the left-hand mouth of the bore or opening of the box, and correspondingly against the lower edge of the right-hand mouth.

Each hanger D and E has an appropriate hook, *m* or *m'*, the one for upholding the apparatus when in use and the other for hanging thereon the articles to be weighed. I prefer to attach the hook to the upper hanger, so that the whole apparatus may swing around on it; and to do this a simple and effective way is to make a vertical hole through the part *h* large enough to insert the shank of the hook loosely therein, and provide this shank with screw thread or threads and with nuts m^2, one above and one below this cross piece or part *h*.

It will now be seen that the beam is not fulcrumed or pivoted, but the box is; that no detached or removable weights are employed, a single and fixed weight being used instead; that a short beam, even with this single weight, is efficient, because upon sliding one end of the beam and its weight F farther out from the box the leverage at that end of the beam is proportionately lengthened or increased, while the leverage and weight of that part of the beam at the opposite side of the box are proportionately shortened or diminished. Every shifting of the beam, therefore, produces a double effect—that is, the effect which would result from merely lengthening practically one arm of the beam-lever by the shifting of the same is proportionately added to or doubled by the corresponding shortening of the other arm of this lever-beam.

My improvements are applicable to a great variety of scales or weighing-machines.

I claim—

1. In combination with the beam C and the box in which the same slides and the hanger D, a buffer, B, surmounting said box and provided with the upward projections *b'* b^2, serving with the hanger as stops to limit the swing of the beam, substantially as and for the purposes set forth.

2. In combination, the box, the buffer B, having the stops *b'*, b^2, and *a'*, and the sliding beam having the fixed weights F and G at its respective ends, all substantially as and for the purposes set forth.

3. In combination with the hangers D and E, the box A, provided with dovetailed grooves, the cross-pieces I J, made dovetailed, as described, and fitting in said grooves, and provided at their ends with edges serving as bearings for said hangers, all substantially as shown and described.

4. In combination with the box having the stops *b'* b^2 at its top and the projection *a'* at its bottom and a pointer on projection *a'*, a beam having the fixed stop K, serving to limit the sliding movement of the beam and to insure the bringing of the pointer to the zero-point.

5. In combination, the box with its stops *b'* b^2 and projection *a'*, the hangers D and E, the sliding non-fulcrumed scale-beam weighted, as set forth, and provided with the stop K, and the pointer *l*, all substantially as set forth.

WADDY C. THOMSON.

Witnesses:
WILL T. NORTON,
N. G. GIBSON.