(No Model.)

J. F. KINGWILL.

SPRING SCALE.

No. 282,645. Patented Aug. 7, 1883.

Fig. 1

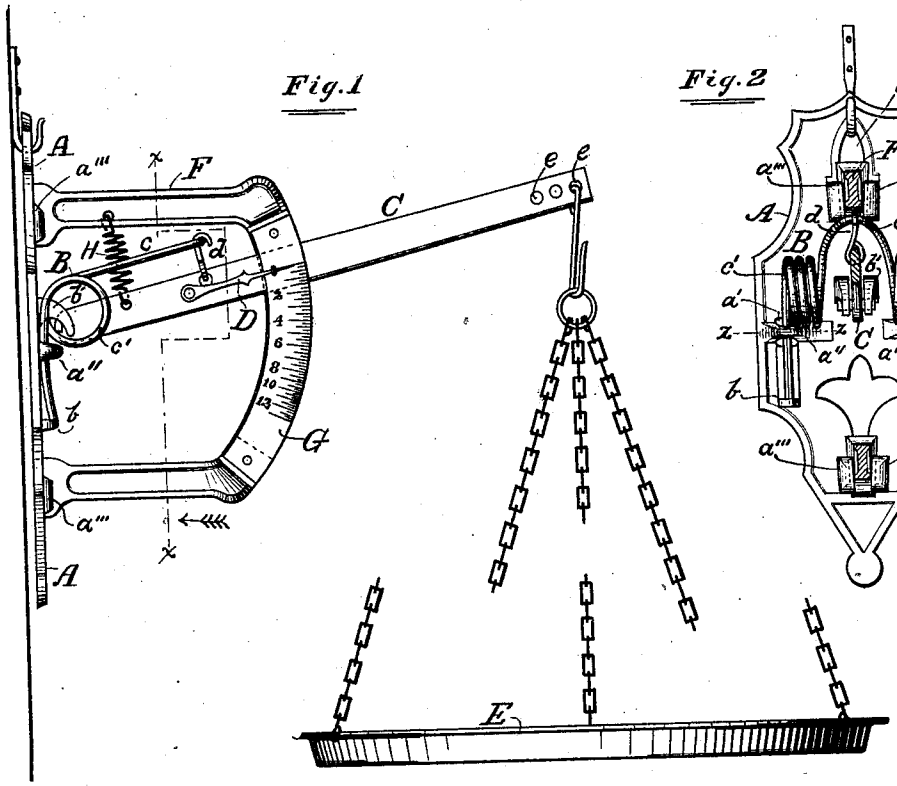


Fig. 2

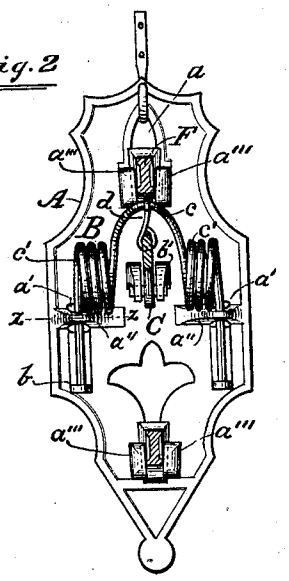


Fig. 3

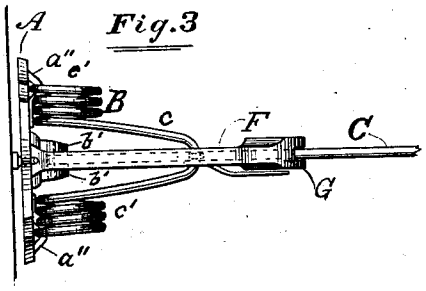
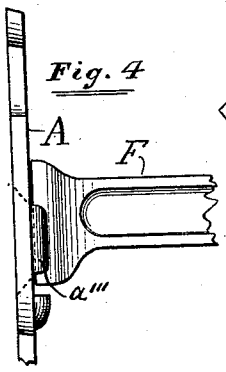


Fig. 4



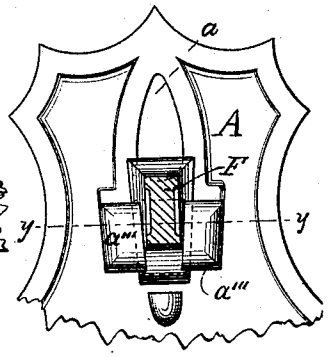


Fig. 5

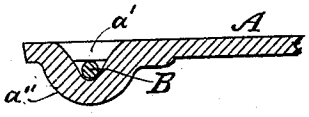


Fig. 7

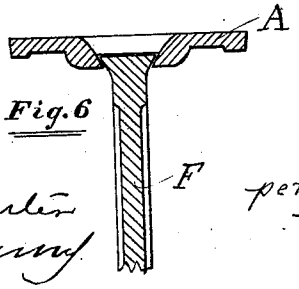


Fig. 6

Witnesses.
Henry Franklin
J. B. Halpenny

Inventor,
John F. Kingwill
per F. F. Warner
his Attorney.

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

JOHN F. KINGWILL, OF CHICAGO, ILLINOIS.

SPRING-SCALE.

SPECIFICATION forming part of Letters Patent No. 282,645, dated August 7, 1883.

Application filed March 31, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. KINGWILL, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Spring-Scales, of which the following, in connection with the accompanying drawings, is a specification.

In the drawings, Figure 1 is a side view of a spring-scale embodying my invention. Fig. 2 is a section in the plane of the line *x x* of Fig. 1. Fig. 3 is a top view of the scale. Fig. 4 is detail showing the manner of joining the back plate and the beam-guide. Fig. 5 is a front view of the parts shown in Fig. 4. Fig. 6 is a section in the plane of the line *y y* of Fig. 5, and Fig. 7 is a section in the plane of the line *z z* of Fig. 2.

Like letters of reference indicate like parts.

A represents a wall-plate, in the upper end of which is a hole or opening, *a*, to adapt the said plate to be hung upon a hook, screw, or other suitable support for suspending the scale in any convenient place. In the central part of the plate A are small openings *a' a'*, and *a'' a''* are arched or bow-shaped projections extending forward over the openings *a' a'*. The openings *a' a'* are not essential, but only a mere incident in the mode of casting eyes for the reception of the ends of the spring, as will hereinafter more fully appear, the said eyes being cast in the example shown by what is known among moulders as the process of "coping." In the upper and lower parts of the plate A are lugs *a''' a'''*, also cast thereon by coping, and constituting dovetail sockets for the reception of the ends of the scale-beam guide, as will hereinafter be more fully explained. Below the parts *a'' a''* are small projections or rests *b b* for the ends of the spring above referred to, and *b' b'* are downwardly-curved fingers projecting forward from the central part of the wall-plate.

B is a centrally bent and coiled spring, the lower parts of which enter the eyes formed by the arches *a'' a''*. The ends of this spring rest upon the rests *b b*. I bend this spring centrally to form a horizontal arm, *c*, and between this horizontal arm and the ends of the spring are the coils *c' c'*.

It will be perceived that a downward pressure on the arm *c* will be yieldingly resisted by the coils *c' c'*, which are the more tightly or closely wound or coiled by this pressure, instead of being spread or opened thereby. In other words, the action is different from that of a close coil suspending a weight.

C is the scale-beam, the rear end of which bears against the fingers *b' b'*, and which is suspended from the arm *c* by means of a hook, *d*, as is clearly shown in Figs. 1 and 2. I desire to state, however, that it is not essential to my invention that the beam C should be linked to the arm *c;* but it may be rigidly attached thereto, in which case it need not bear against the arms *b' b'*.

D is an index-hand or pointer applied to the beam C. In practice I prefer to pivot hand or pointer D to its beam, for the purpose hereinafter set forth.

In the forward or free end of the beam C, I make a number of holes, *e e*.

E is a dish or hopper suspended from the forward end of the beam C.

F is the beam-guide, the rear ends of which are adapted to sit fittingly between the lugs *a''' a'''*, which support the said guide removably. Applied to the forward part of the guide F is a graduated plate, G, between which and the guide the beam C is arranged and allowed to vibrate freely up and down. The hand D is at the zero point or character when the scale is balanced and the dish or hopper E contains nothing to be weighed; but if the said dish contains anything, the beam C and its hand will move downward and indicate the weight of the contents of the dish.

H is a supplemental close spiral spring connected to the upper arm of the guide F and to the beam C. I employ the spring H, which is a much lighter and more delicate spring than the spring B, for the purpose of causing the index-hand to indicate ounces instead of pounds, the beam C being disconnected from the spring B when the spring H is employed; but the spring H has no necessary connection with the other features of my invention, excepting when employed as described.

It may sometimes occur in practice that the yielding quality of different springs B B will vary, so that the index-hand, when operating in connection with one of the said springs, will

not stand in the same relation to the graduated scale as when operating in connection with another. In other words, a change of beam-supporting springs may cause the scale to indicate erroneously; and to compensate for this variation I cast several holes, *e e*, in the forward end of the beam, so that, in testing, the length of lever adapted to that particular spring may be obtained without the necessity of marking and drilling each beam, thereby saving a great amount of labor.

After the various parts of the scale have been arranged together for use a pointer rigidly attached to the beam would rarely point exactly to zero. I therefore attach the pointer adjustably to the beam, but firmly enough not to be subject to accidental displacement.

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

1. The combination, in a spring-scale, of the wall-plate A, the centrally bent and coiled spring B, having a horizontal arm, *c*, the scale-beam C, linked between its ends to the arm *c*, and bearing at its rear end against the plate A, the beam-guide F, the graduated plate G, and the index-hand D, pivoted to the beam C, all arranged substantially as described in relation to each other, and for the purposes set forth.

2. The combination, in a spring-scale, of the wall-plate A, the centrally bent and coiled spring B, having a horizontal arm, *c*, the scale-beam C, having in its forward end the holes *e e*, and linked between its ends to the arm *c*, and bearing at its rear end against the wall-plate A, the detachable beam-guide F, the graduated plate G, and the index-hand D, pivoted to the beam C, all arranged substantially as described in relation to each other, and for the purposes set forth.

3. The combination, in a spring-scale, of the wall-plate A, the centrally bent and coiled spring B, the supplemental spring H, the beam-guide F, the graduated plate G, the scale-beam C, and the index-hand D, pivoted to the said beam, all arranged substantially as shown and described, and for the purposes set forth.

JOHN F. KINGWILL.

Witnesses:
F. F. WARNER,
J. B. HULPENNY.