

No. 667,425.

Patented Feb. 5, 1901.

J. W. CULMER.
SPRING BALANCE SCALE.

(Application filed Mar. 25, 1898.)

(No Model.)

Fig. 1.

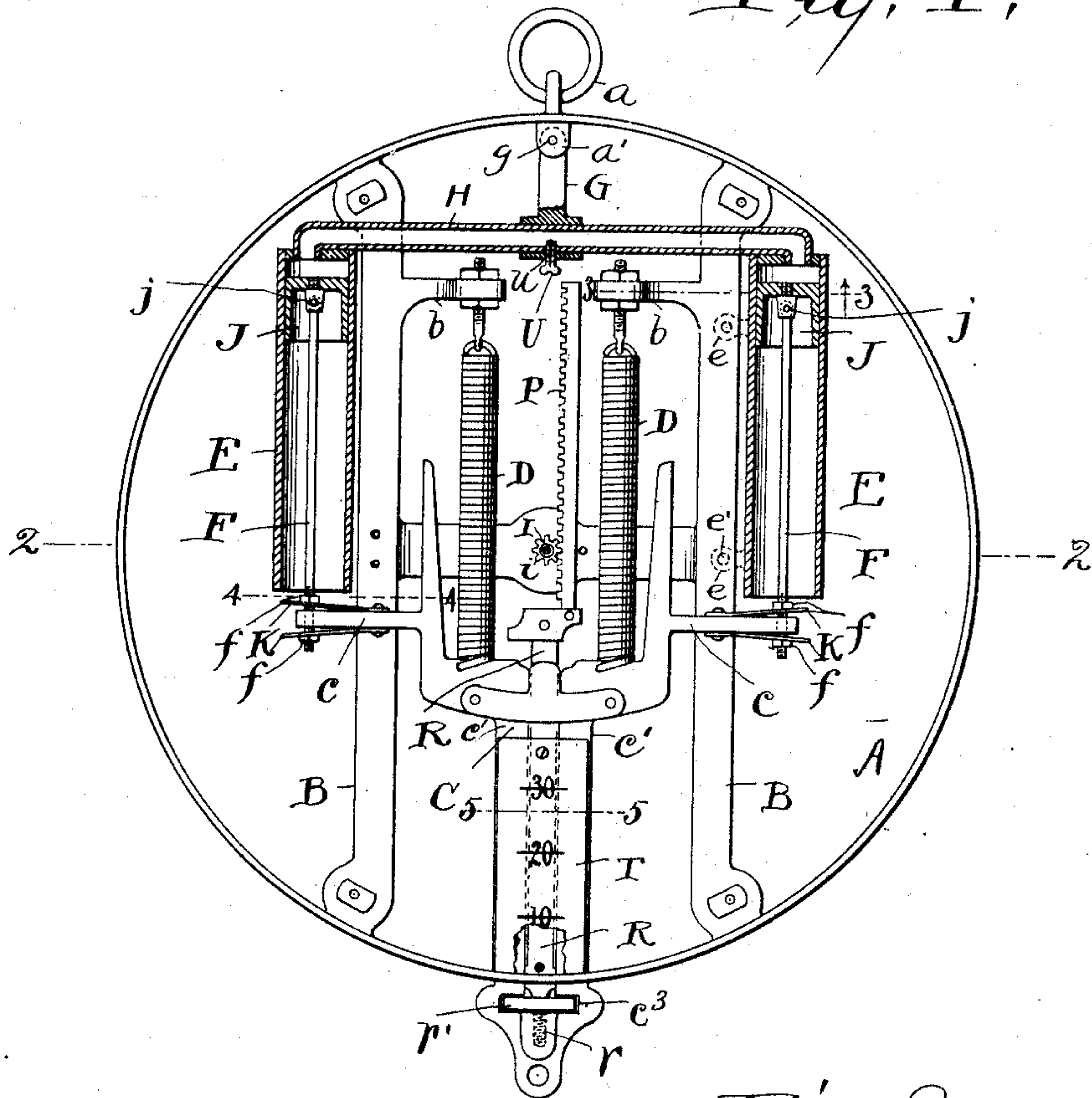


Fig. 2.

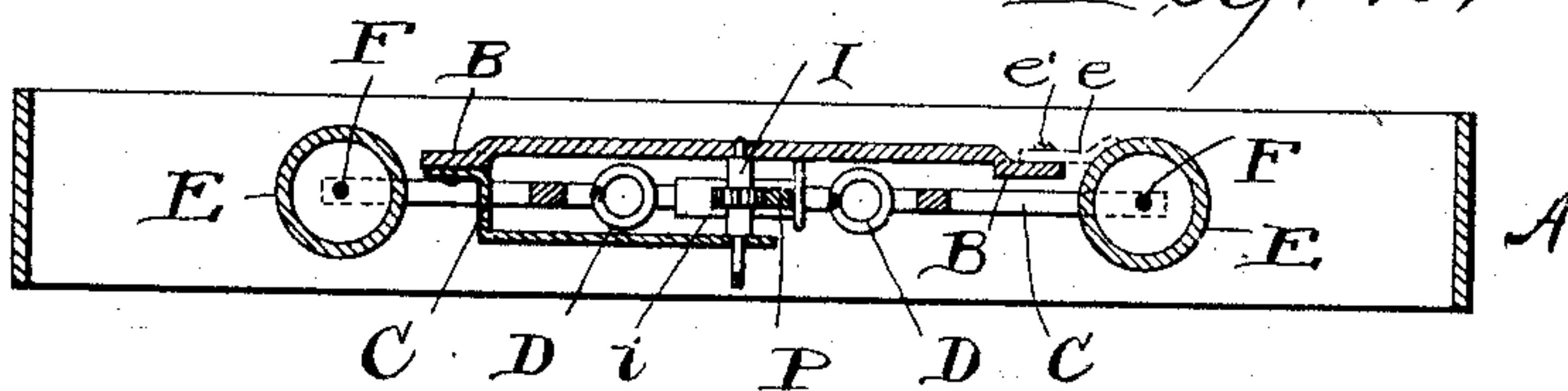


Fig. 4.

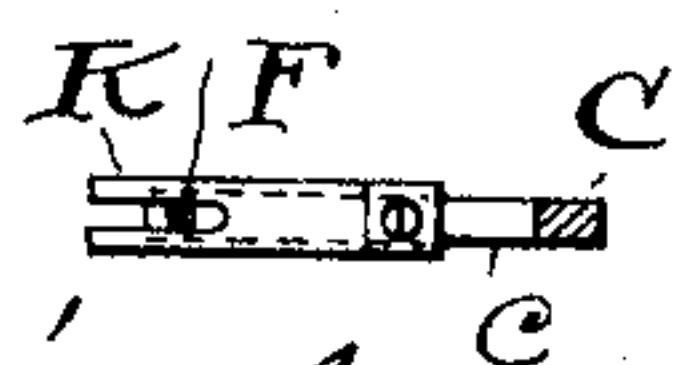


Fig. 3.

Fig. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

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SPRING-BALANCE SCALE.

SPECIFICATION forming part of Letters Patent No. 667,425, dated February 5, 1901.

Application filed March 25, 1898. Serial No. 675,060. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. CULMER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Spring-Balance Scales, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

My invention relates to improvements in spring-balance weighing-scales, and particularly to the construction of the runner and to the means whereby the violent movement of the runner, and consequently of the entire scale, is controlled.

The invention consists in the construction and combination of parts hereinafter described, and pointed out definitely in the claims.

In the accompanying drawings, Figure 1 is an elevation of the scale mechanism with the face plate or plates and associated indicating device removed. Fig. 2 is a horizontal central section of the scale on the line 2 2 of Fig. 1 looking downward. The remaining figures are detail horizontal sections of Fig. 1, Fig. 3 being on the line 3 3 looking upward, Fig. 4 on the line 4 4 looking downward, and Fig. 5 on the line 5 5 looking upward or downward.

The frame or case of the scale may be of any form suitable to contain the scale mechanism. In the form shown it consists of an external cylindrical rim A and two substantially vertical brace-bars B B, lying on opposite sides of the scale-spindle I, which is mounted in the center of the scale-frame. This scale-frame is intended to be suspended from the ring *a*. The vertically-movable load-bearing member or runner C is suspended within the scale-case from the lower ends of two coil-springs D D, the upper ends of which are made fast to the horizontal bracket-arms *b* or other suitable supporting devices.

Within the scale-case the runner is provided with two laterally-extended arms *c*, which arms, near their extremities, are perforated vertically, the perforations being large enough to permit the rods F, which pass through them, to have a little lateral play. Within the frame and suitably suspended are two dash-pot cylinders E E, whose axes are

substantially vertical and in line with the holes in the ends of the runner-arms before referred to. The upper or closed ends of these dash-pot cylinders are connected by means of an open pipe H, wherefore the air may circulate freely from one cylinder to the other and both cylinders become, in effect, two chambers of one dash-pot. The two dash-pot cylinders or two cylindrical chambers of the dash-pot may be connected to and supported by the two vertical brace-bars B B by means of ears *e e*, fast to the cylinders, and screws *e'*, by which the ears are fastened to the brace-bars, and such construction would contain certain parts of my invention, as set forth in the claims. The ears are indicated by dotted lines in connection with the right-hand cylinder only. It is desirable, however, in my judgment, to support these dash-pot cylinders by other means—viz., by means which permit them to automatically adjust themselves so that their axes will be parallel to the path of the runner, whether or not said runner in its movement is deflected out of the true vertical position. The means shown, which are the best means now known to me, consist of a hanger G, which is pivoted at its upper end to ears *a'* on the inner periphery of the frame-rim by means of the transverse horizontal pivot *g*, located vertically above the scale-spindle, wherefore the lower end of this hanger is permitted to rock from one side to the other of a vertical plane passing through the scale-center. The lower end of this hanger embraces the pipe H, by means of which the closed ends of the two dash-pot cylinders are connected and the pipe is rigidly fixed in said hanger. The movement of the hanger upon its pivot causes a like movement of the said pipe. The dash-pot cylinders and the pipe H are so constructed and connected that they become, in effect, a single rigid structure, which moves as an entirety with the hanger.

In each cylinder a plunger J is loosely mounted, and the rods F, before referred to, are connected at their upper ends to the plungers by what may be called a "flexible" connection—that is, a connection which permits the rod to move a short distance in all directions from the point of connection. The connection shown is a loose pivot-pin *j*.

The two dash-pot cylinders being outside of the vertical axis of the scale mechanism greatly steady the motion of the runner, and thereby prevent undue wear of the rack and pinion. The slight motion of which the two dash-pot cylinders is capable permits them to adjust themselves into the line of movement of the runner, wherefore there is little or no danger that either of the plungers will be cramped by being in the cylinders. The open connection between the two dash-pot cylinders makes the pressure in both alike, so that one side of the runner is never retarded with any greater force than is the other side.

A screw U is screwed into the connecting-pipe H. It has a groove *u* in its surface which grows gradually deeper toward its end. This slot furnishes a vent for the passage of air to and from the dash-pot chambers, which passage is enlarged by screwing the screw out and reduced by screwing it in.

The rods F are threaded for the stop-nuts *f f*, which are placed one above the runner-arm *c* and one below and at such a distance apart as to admit of a slight motion of the arm relative to said rod. Between each nut and the arm *c* a spring K is interposed, having one end fast upon the corresponding arm *c* and the other end engaging in tension against the nut, so that either in the starting or stopping of the runner any shock incident thereto is absorbed by these springs and is not transmitted to the plungers or the connections between them and the rods F.

The rack P, which meshes with the pinion *i* on spindle I, is connected with the bar R, which is rigidly fastened to the runner when the scale is ready for use, but which may be adjusted vertically relative to the runner. This bar R lies and is slidable between the two side bars *c' c'* of the runner. On its lower end is a threaded stem *r*, onto which screws a thumb-nut *r'*. This thumb-nut lies in a horizontal slot *c³* in the runner, whereby it is prevented from moving up or down.

T T represent plates which are fastened by screws or otherwise to opposite sides of the bar R, lying close to the faces of the runner over which they lie, as shown. These plates hold the bar R in proper relation to the runner and guide it in its movements. They also make it unnecessary that the bar R and runner shall be nicely fitted to each other, and, further, make it unnecessary that the faces of said bar and runner shall be nicely finished, because said plates cover and hide the said faces. The graduations which have heretofore been made on the bar R are now made upon the plates T T.

Having described my invention, I claim—

1. In a spring-balance, the combination with the spring-suspended runner, of two communicating dash-pot chambers, which are supported in parallel relation, on opposite sides of the runner, plungers freely movable

in said dash-pots, and rods connecting said plungers and runner, substantially as specified.

2. In a spring-balance, the combination with the spring-suspended runner, of two communicating dash-pot chambers supported in parallel relation on opposite sides of the runner, plungers freely movable in said dash-pots, rods connected with said plungers and the runner, means for regulating the passage of air to and its escape from the dash-pot chambers, substantially as specified.

3. In a spring-balance scale, the combination with the spring-suspended runner, of a double dash-pot having two parallel and communicating chambers, located on opposite sides of the scale-center, said double dash-pot being flexibly suspended from the scale-frame at a point vertically in line with the scale-center, plungers moving freely in said chambers, and rods flexibly connected with said plungers and runner, substantially as specified.

4. In a spring-balance, the combination with the spring-suspended runner, of two dash-pot chambers which are rigidly connected in parallel relation, and lie on opposite sides of the scale-center, the structure formed of said connected dash-pot chambers being pivoted on a horizontal pivot at a point in the vertical plane passing through the scale-center, two plungers in said chambers, and rods flexibly connected with the plungers and the runner, substantially as specified.

5. In a spring-balance, the combination of the scale-frame, and spring-suspended runner, with two dash-pot cylinders, a hanger pivoted to the scale-frame on a pivot parallel with the scale-spindle at a point vertically above said spindle, and a pipe made fast to said hanger and connected rigidly with said cylinders whereby they are held in parallel relation and open communication is established between them, plungers in said cylinders, and rods connected with said plungers and runner, substantially as specified.

6. In a spring-balance, the combination of the scale-frame and the spring-actuated runner, having the laterally-extended and vertically-perforated arms, with two vertical dash-pot cylinders supported in said frame axially in line with the perforations in said arms, plungers in said cylinders, rods flexibly connected with said plungers, and passing loosely through said perforation, shoulders on said rods above and below the runner-arms, and two springs made fast to each runner-arm and engaging with said shoulders, substantially as specified.

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

JOHN W. CULMER.

Witnesses:

OLIVE GILL,
G. W. RISH.