

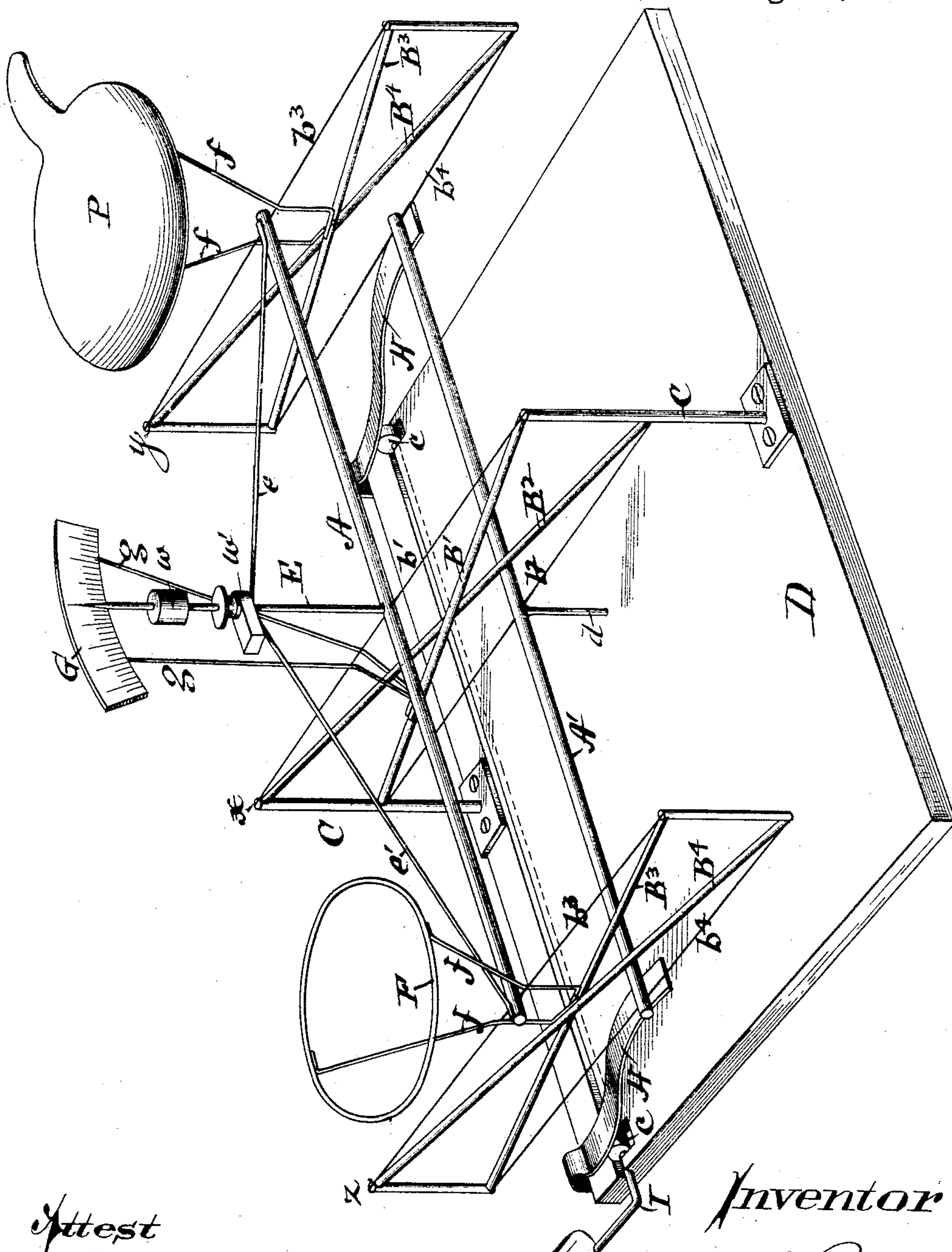
(No Model.)

F. A. ROEDER.

## BEAM SCALES.

No. 262,905.

Patented Aug. 15, 1882.



*Attest*

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# UNITED STATES PATENT OFFICE.

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ALFRED SPRINGER.

## BEAM-SCALE.

SPECIFICATION forming part of Letters Patent No. 262,905, dated August 15, 1882.

Application filed April 7, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK A. ROEDER, a citizen of the United States, residing at Cincinnati, Hamilton county, Ohio, have invented new and useful Improvements in Balances, of which the following is a specification.

My invention relates to that class of balances or weighing-scales in which the torsional elasticity of metal wires or rods is used as the pivotal supports for scale-beam and pendants; and it consists in an improved construction of such scales, whereby greater strength is secured without sacrificing the sensitiveness which gives such balances their value in delicate manipulations, and whereby, also, the balance is adapted to more convenient use by druggists, grocers, &c.

The preferred construction of the apparatus is illustrated in the drawing accompanying this specification, which shows my improved balance complete, excepting as to the boxing, which is removed to exhibit the structure more clearly.

In this, as in the said former invention, the scale-beam A is centrally pivoted to and upon a horizontally-stretched wire, and carries at the ends frames holding wires in a similar state of tension as the pivotal supports of the scale-pans.

The central supporting-wire,  $b'$ , is secured in a frame consisting substantially of two diagonally-arranged cross-bars,  $B'$   $B^2$ , around whose ends the wire is stretched, forming a rectangular frame, which is supported above the base-plate D by standards C C, one at each side.

The terminal pendent frames are constructed of cross-bars  $B^3$   $B^4$  and a stretched wire,  $b^3$ , in precisely the same manner.

The scale-beam A, which is preferably a thin metallic tube, is secured to the central and terminal pivot-wires,  $b'$   $b^3$   $b^3$ , by passing the wires through parallel cross-slots or apertures through the tube in the same plane, and securing the wires to the beam by soldering when all parts are adjusted. I add an auxiliary scale-beam,  $A'$ , below and parallel to the first, securing it to the wires  $b^2$   $b^4$   $b^4$ , which form the corresponding opposite sides of the central and terminal pivot-frames in precisely the same manner. The two scale-beams being

thus pivoted in the same vertical plane, the terminal pivot-frames always maintain their perpendicularity and parallelism. Instead of suspending the scale-pans from the terminal pivot-frames, I arrange supporting plates or rings F, held by standards  $f$   $f$ , above the cross-pieces of the terminal frames. These may be carried to any convenient height above the boxing, by which the scale is preferably surrounded for security and convenience.

It will be obvious that the spirit of my invention embraces three or any greater number of scale-beams, they being torsionally supported at the center in the same vertical plane, and torsionally connected at their ends by frames similar to those described.

It will be seen that by the arrangement shown in the drawing the weight of the scale-beams, pans, and contents is distributed through the six horizontal wires  $b'$   $b^2$   $b^3$   $b^3$   $b^4$   $b^4$ , all acting torsionally. It is obvious, therefore, that very small wires may be used, having a very minute torsional resistance, while at the same time the general strength and rigidity of the apparatus are maintained.

The scale-beam A is provided with a pointer, E, projecting upward from the center, to which adjustable weights  $w$  and  $w'$  are secured by screw-threads, so as to regulate the center of gravity. Strengthening-cords  $e$   $e$  connect the pointer E with the ends of the beam A to prevent deflection of the latter when sustaining weights. The pointer E plays in the usual manner across a graduated scale-piece, G, sustained above the central frame by standards  $g$   $g$ .

As a means of preventing movement of the scale-beam when not actually in use, I provide an arrester consisting of a shaft, I, arranged across the base-plate D, parallel with the scale-beams, on which are secured two eccentric cams,  $c$   $c$ , operating beneath two spring-tongues, H. The latter are secured at one end to the base D, and are so arranged that when elevated by the cams  $c$  they impinge against and support the outer ends of the auxiliary scale-beam from below. The end of the shaft I in the completed apparatus projects through the boxing and is furnished with a milled head or crank for manipulation.

A finger, *d*, may be arranged to project centrally downward from the lower scale-beam, *A*, of such a length as to come in contact with the base-plate whenever the pivot-wires are deflected beyond a given angle by the superposed weight, and thus prevent injuries to the scale by overloading. It can also be used for supporting an adjustable weight to change the center of gravity, as may be desired.

10 Having described my invention, I claim and desire to secure by Letters Patent—

1. In a torsional pivot-balance, one or more auxiliary scale-beams pivoted in the same vertical plane with the main beam, and connected  
15 therewith through the terminal pivot-frames, substantially as and for the purpose specified.

2. In a torsional pivot-balance, the combination of the main and auxiliary beams *A A'* and central and terminal pivot-frames, *x y z*, substantially as set forth. 20

3. The shaft *I*, provided with eccentric cams *c*, in combination with the springs *H*, as a motion-arrester for balances, arranged and operating substantially as set forth.

In testimony whereof I have hereunto set  
my hand in the presence of two subscribing witnesses. 25

FREDERICK A. ROEDER.

Witnesses:

L. M. HOSEA,  
GEO. B. MUSCHLER.