

(No Model.)

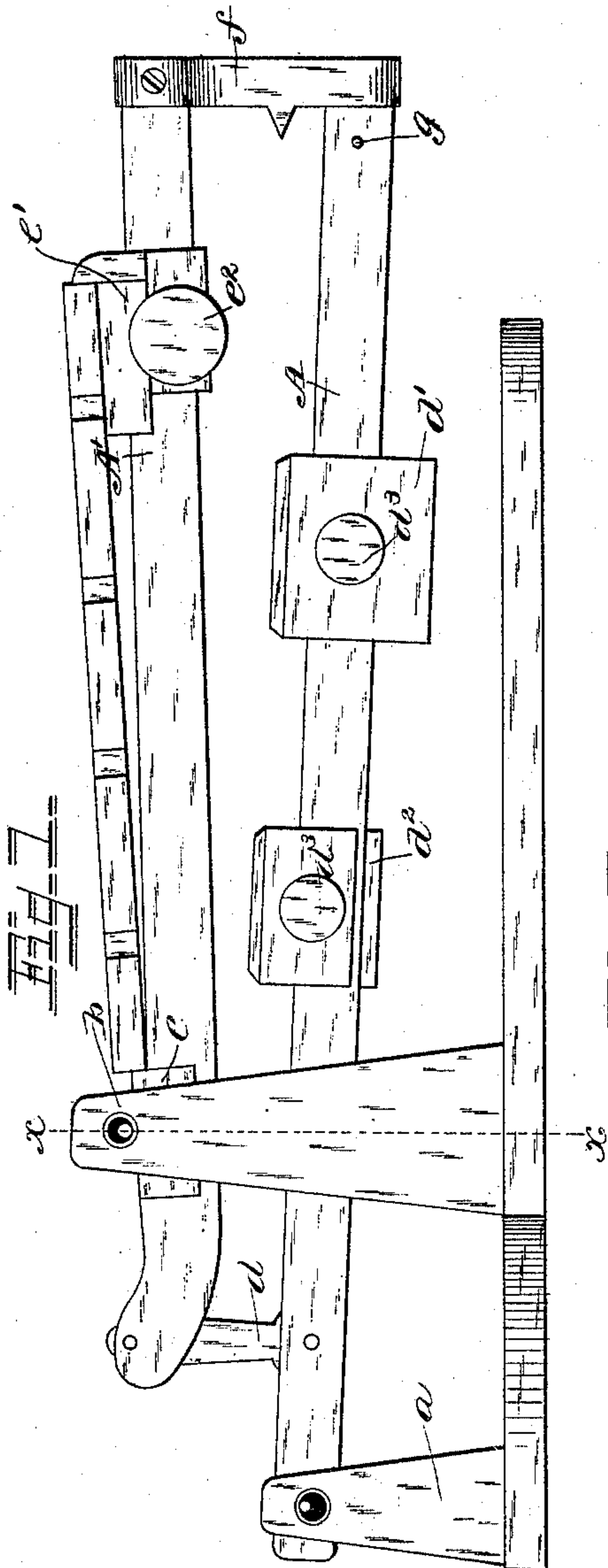
2 Sheets—Sheet 1.

G. M. BEARD.

PROPORTIONAL BALANCE.

No. 324,638.

Patented Aug. 18, 1885.



WITNESSES.

W. J. Schneider
J. Notman Gill

INVENTOR_

George M. Beard

By Myers & Co

ATTORNEYS.

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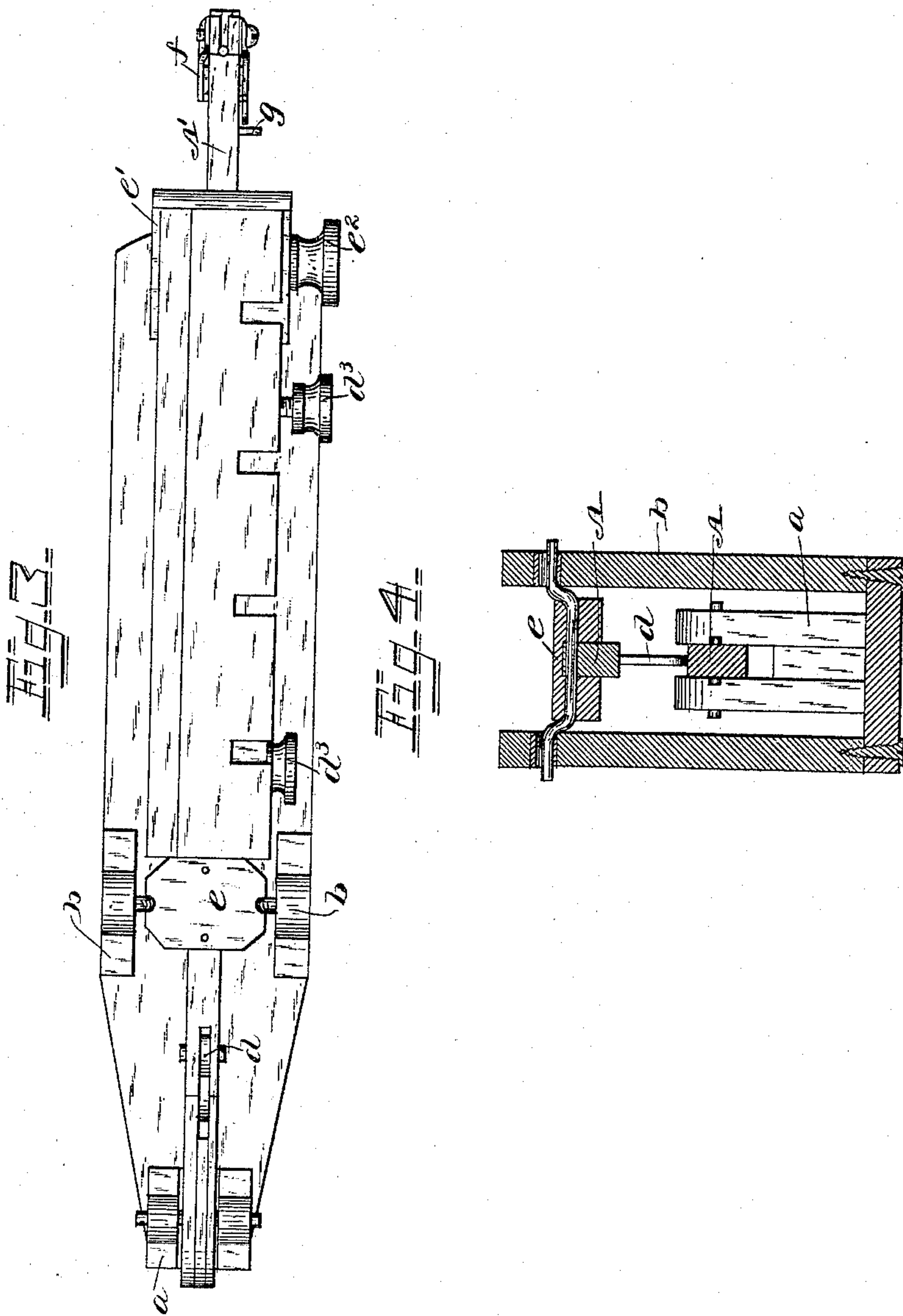
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John M. Gill.

INVENTOR.

George M. Beard
By [Signature]

ATTORNEY.

UNITED STATES PATENT OFFICE.

GEORGE M. BEARD, OF AUBURN, INDIANA, ASSIGNOR OF ONE-HALF TO
WM. H. RAKESTRAW, OF SAME PLACE.

PROPORTIONAL BALANCE.

SPECIFICATION forming part of Letters Patent No. 324,638, dated August 18, 1885.

Application filed May 4, 1885 (No model.)

To all whom it may concern:

Be it known that I, G. M. BEARD, a citizen of the United States of America, residing at Auburn, in the county of De Kalb and State of Indiana, have invented certain new and useful Improvements in Proportional Balances, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention pertains to improvements in balances having specially for its object to secure uniformity in weight of the knives or cutters of rotary cutter-heads, as also to proportionally balance the individual knives; and
15 the invention consists of the combinations of parts and their construction, substantially as hereinafter fully set forth and claimed.

20 In the accompanying drawings, Figure 1 is a side elevation of my invention. Fig. 2 is an end view. Fig. 3 is a plan view, and Fig. 4 is a transverse section taken near the pivot or fulcrum of the upper or top lever on the line *x x*.

25 In carrying out my invention I employ two levers, A A', arranged in the same vertical plane, one being disposed above the other. The lower longer lever, A, is pivoted at one end between parallel uprights or studs *a*, the pivot of said lever bearing in apertures of said
30 studs or uprights, said lever having a principal weight, *d'*, and a supplementary smaller weight, *d''*, each of which is provided with a set or adjusting screw, *d'''*, which screws have the advantage to hold, as against sliding, the
35 weights at their points of adjustment, whereby no readjustment of the weights is required in balancing a subsequent knife or knives, as would be the case were they devoid of the retention or adjusting screws. The upper shorter
40 lever, A', is fulcrumed or pivoted near one end between other uprights, *b*, the pivot of said lever bearing in the upper ends of said uprights. This lever is connected at one end—that nearer to its pivot—by a link, *d*, to the lever A, near the pivot of the latter, the connection between the two levers being thus effected intermediately of their pivots or fulcrums, whereby their action is rendered uniform.

50 The lever A' is provided upon its upper edge with a fixed stop, *e*, the center of which

stop is directly under the pivot or fulcrum of the lever. This lever is also provided upon its upper edge with a second stop, *e'*, which is movable or adjustable by means of a set or
55 adjusting screw, *e''*, said stops also being adapted to permit the temporary holding of the cutter or knife, which, when balanced, is placed thereon.

The extreme forward end of the lever A' is 60 provided with a fixed pendent rectangular loop or guide, *f*, having an index or pointed projection upon the inner edge of one side, and receiving the free end of the lever A, the latter also having a lateral projection or stud, *g*, 65 arranged to project in a plane nearly touching the point of the projection or index *f*, aforesaid, the purpose of which will appear farther on. The pivot or fulcrum supporting
70 uprights or standards are secured to a common base or suitable support, as shown, while the pivots or fulcrums of the levers are tapered to pointed or sharp edges, which bear upon
75 metallic linings in the apertures of the said uprights already referred to to render their bearings highly sensitive, the object of which is apparent.

In operation it will be seen that by placing a cutter or knife of the aforesaid description upon the rests or stops *e e'*, then adjusting or
80 moving the stop *e'* according to the length of the cutter or knife, whether short or long, and then adjusting or moving the weight or weights *d' d''*, as the case may be, of the lower lever, A, the cutter or knife will be balanced, which fact 85 will be determined by the coincidence of the index or projection *f* and projection *g*. The knife or cutter can now be removed, and be reversed end for end, and be again placed upon the rests or stops of the upper lever, A', 90 when, should the ends of the knife be of equal weight or balanced, the knife will be again removed and be ready for use. Should, however, the outer forward end of upper lever, A', rise, this would be an indication that that end 95 of the knife or cutter would be the lighter; but should that end of the said lever sink such would indicate the fact that said end of knife or cutter would be the heavier. To render both ends of the knife uniform as to weight, the
100 heavier end is of course properly ground off to effect the purpose. The knife or cutter thus

ground off is returned to the rests or seats of the upper lever to ascertain if the said ends of knife or cutter now balance. If not, the latter is further ground off, and the balancing of the same again attempted, and so on until the required end is secured—viz., the balancing of the knife or cutter proportionally or as to its ends, and the balancing of the entire set of knives or cutters of a rotary cutter-head, to render each of the same weight.

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

1. In the balance, the combination of the levers connected together and supported as described, one of said levers having a fixed stop or rest with its center directly under its pivot or fulcrum, and having a movable or adjustable rest or stop, substantially as and for the purpose set forth.

2. In a balance, in combination with the lower lever pivoted at one end between parallel uprights or studs, and having an adjust-

able supplementary and principal weight and a point or projection, the upper lever connected to said lower lever by a link, and having a fixed and a movable or adjustable stop, and a pendent guide or loop having an index or pointed projection, substantially as shown and for the purpose set forth.

3. In a balance, the combination of the levers connected together and supported as set forth, the upper lever having a fixed and a movable or adjustable rest or stop, and the pendent loop or guide having an index, and the lower lever having an adjustable supplementary and principal weight, and a projection or point to coincide with the said index, substantially as shown and described.

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

GEORGE M. BEARD.

Witnesses:

WILLIAM H. RAKESTRAW,
CHARLES B. WEAVER.