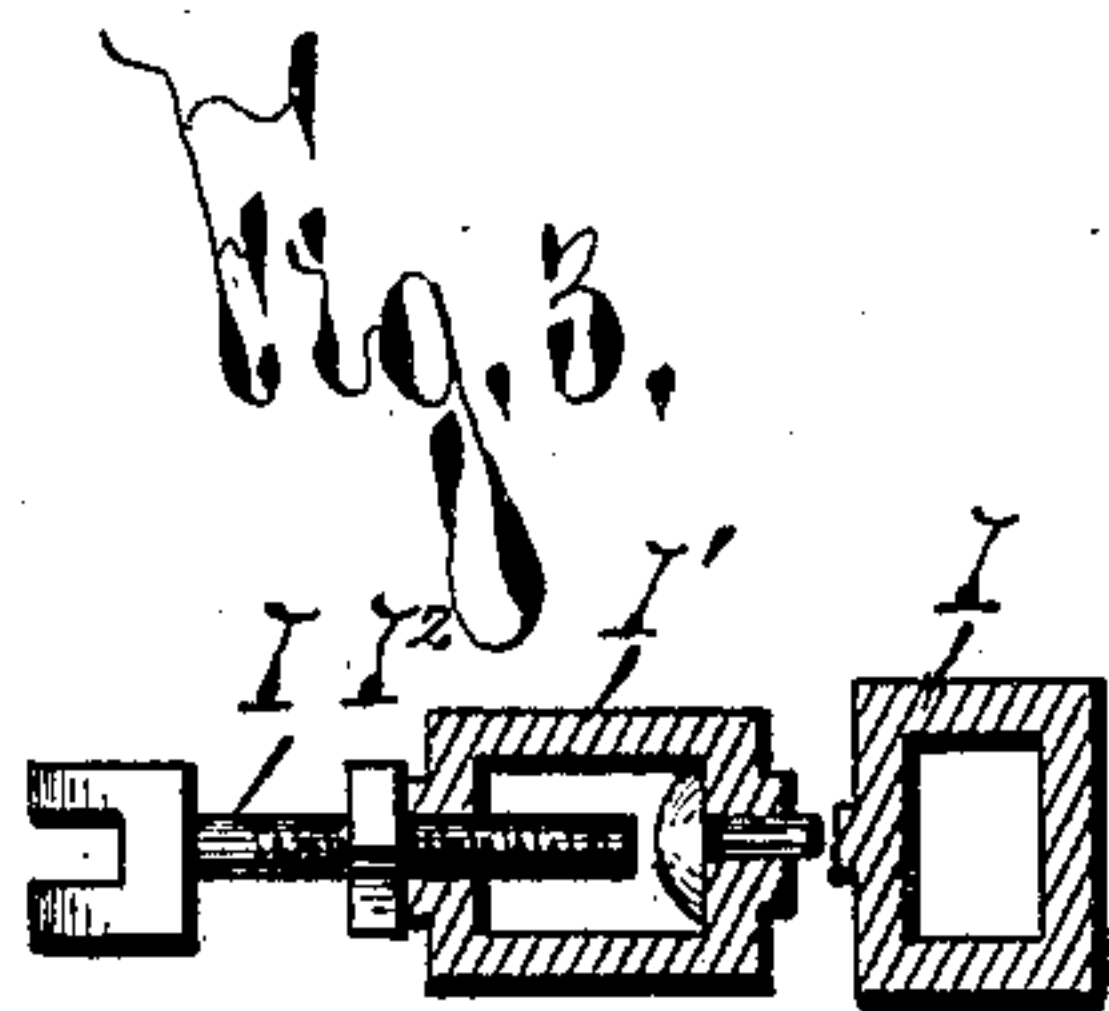
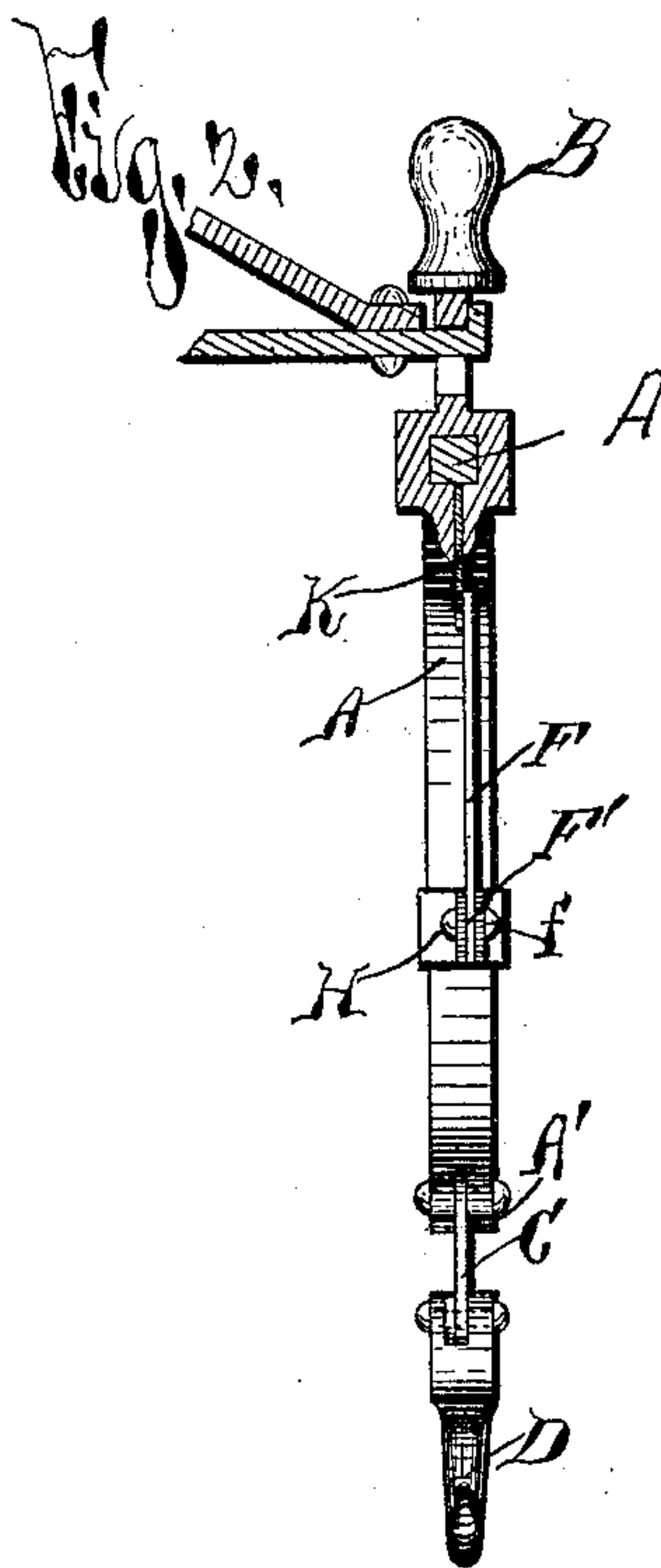
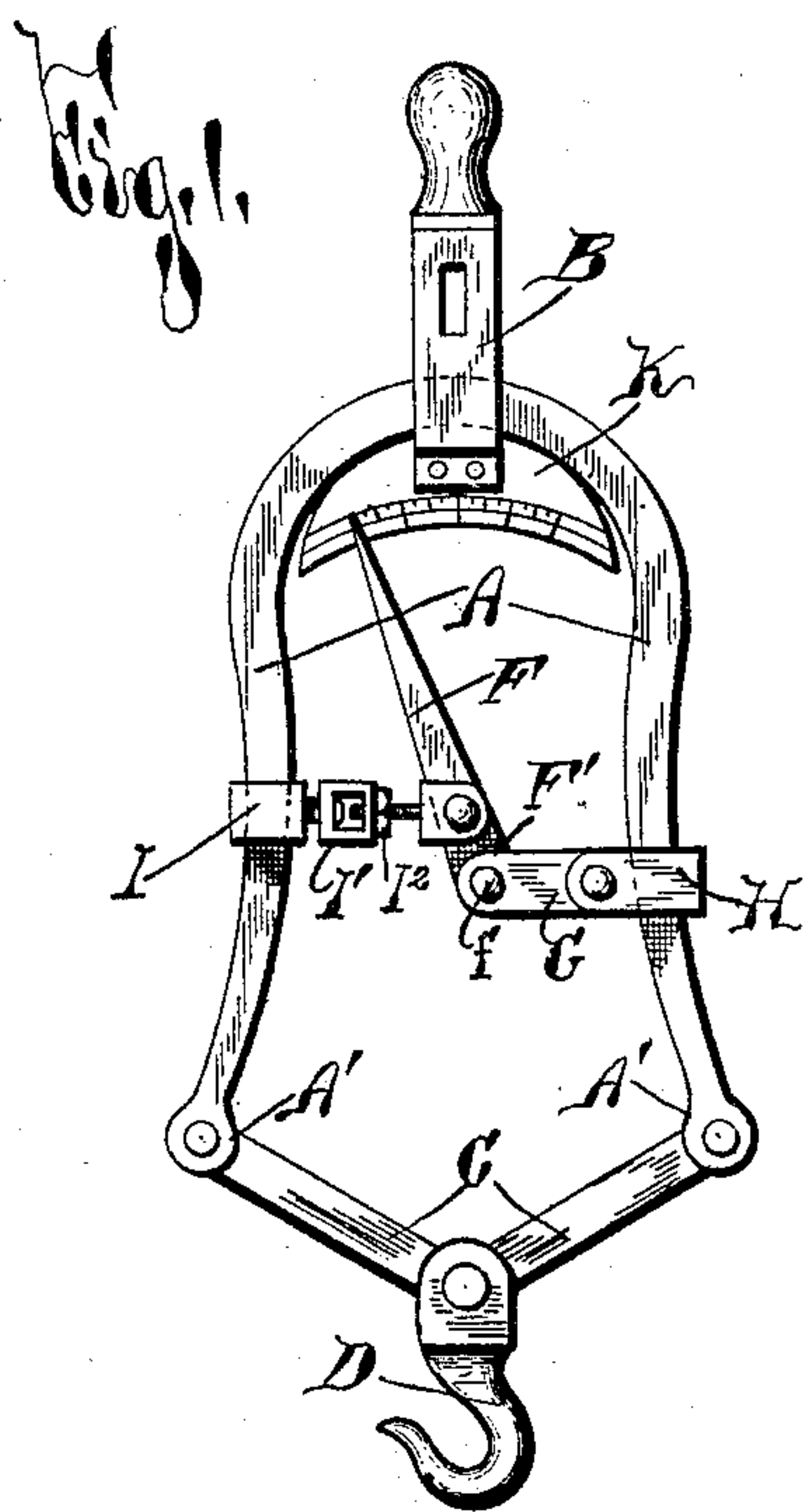


(No Model.)

E. F. BERGMAN.
SPRING SCALE.

No. 406,499.

Patented July 9, 1889.



WITNESSES:

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EDWARD F. BERGMAN, OF FRANKFORT, ASSIGNOR OF ONE-HALF TO JOHN
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SPRING-SCALE.

SPECIFICATION forming part of Letters Patent No. 406,499, dated July 9, 1889.

Application filed October 29, 1888. Serial No. 289,362. (No model.)

To all whom it may concern:

Be it known that I, EDWARD F. BERGMAN, of Frankfort, in the county of Herkimer, in the State of New York, have invented new and useful Improvements in Spring-Scales, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to spring-scales, and has for its object the production of a simple and effective spring-scale which shall be easily and cheaply manufactured, by reason of the peculiar and simple construction of its parts, and shall be pleasing in appearance, very effective, and practically indestructible in use, and very compact and efficient.

To this end my invention consists, essentially, in a spring of peculiar form and construction, preferably of a U shape, having one point thereof suspended by a suitable suspension-support, links or connections connected to the opposite legs of said spring and to a suitable weight-engaging device, and supports secured to the opposite legs and connected to an indicator-finger, for rocking the same as the legs of the spring are brought together when weight is engaged with the scale.

It also consists in an adjustable connection to the indicator-finger, whereby the same may be adjusted in its movement; and it furthermore consists in the detail construction and arrangement of the parts, all as hereinafter more particularly described, and pointed out in the claims.

In specifying my invention reference is had to the accompanying drawings, forming a part of this specification, in which like letters indicate corresponding parts in all the views.

Figure 1 is a front elevation of my improved scale, clearly showing the operation and arrangement of the parts. Fig. 2 is an end or side elevation of the device as illustrated in Fig. 1, showing the scale supported by means of a suitable bracket attached to a support; and Fig. 3 is an enlarged detail, partly in section, of the adjustable connection to the indicator-finger.

A represents the spring of my improved spring-scale, of any desirable spring metal, and preferably formed of a U-shaped piece.

B represents a suitable suspension-support secured to the spring at any desirable point thereon, and adapted to be engaged either with the hand or by a bracket or other suitable means of support.

C represents the pivotal connection between the hook or other weight-engaging device D and a suitable point on the spring. These connections or links C, as preferably constructed, are hinged to the extremities A' of the spring and hinged to the weight-support D.

The indicator-finger F is hinged at one extremity F', at the point *f*, to a connection G, preferably hinged or pivoted to a support H, secured upon the spring A at any desirable point thereon. The indicator-finger F is supported at a point between its two extremities in the support I, preferably secured to the spring A at any suitable point.

It will thus be seen that when weight is applied to the spring the free extremities A' will be approximated together, and the indicator-finger, by reason of its connection to the opposite sides or legs of the U-shaped spring, will be rocked on its pivot and its free end will move along the dial K. This dial K is of desirable form and construction and can be attached in any suitable manner in proximity to the indicator-finger F, preferably in the upper part thereof, as illustrated in the drawings.

By shortening the length of the connections C it will be seen that the spring may be changed to weigh articles of only small weight, or by increasing the length of these connections C the spring may be adapted to weigh articles of considerable gravity, because with the spring constructed as described, when the connections C are lengthened, more of the weight is directly supported by the spring arms or legs themselves in a direction parallel with their extension, and they do not tend to approximate toward each other, thus rocking the indicator-finger. On the other hand, when the length of the connections is shortened, a more direct strain is thereby caused upon the spring arms or legs. Accordingly I provide two or more sets of connections C, and by disconnecting one set or pair and sub-

stituting a set of a different length I adapt my scale to weigh either light objects with one pair of connections or to weigh heavy objects with another pair or set of connections, either by the use of a scale of ordinary construction or by one having a double line of weight-indications marked thereon.

It will be observed, by reference to Fig. 1, that in order to prevent all cramping of the spring and the interposed or attached indicator-finger one of the supports thereof is rigidly secured to the adjacent spring arm or leg, and the other support H is connected to the opposite spring arm or leg by the link G, as described.

The rigid support I, I prefer to make adjustable. As shown in Fig. 3, this support is preferably composed of two pieces connected together by the take-up nut or turn-buckle I', which is swiveled to one division and engages the other division by means of screw-threads provided thereupon. A lock-nut I² prevents the unscrewing of the turn-buckle after its adjustment and renders the same more effective. This adjustable connection to the spring allows the indicator-finger to be adjusted upon its dial and insures the perfect setting of the same and registration of the weight, and is especially valuable when changing the capacity of the weighing-scale, as previously described.

The spring A is preferably formed tapering at its extremities, and by reason of the pull or weight being exerted indirectly upon its extremities there is no liability of the spring permanently setting and becoming useless. If from some unforeseen cause or ill usage in the hands of a careless operator the spring should be strained, so as to vary somewhat from the original arrangement of its parts, by means of the adjusting screw I' the indicator-finger may be readily brought to the desired point on the dial, upon which the operation will be the same as before and the registration perfect.

All the parts of this scale are very easily constructed and cheaply manufactured, and with the exception of the pivots, bolts, and nuts all the parts, if desired, may be stamped out of metal, or drop-forged when larger scales are used, thus producing at a minimum cost of production a scale possessing great features of advantage and simplicity of construction and operation.

The operation of my scale will be readily perceived from the foregoing, and it will be particularly understood that by reason of its

peculiar construction its perfect operation is positively assured. It will also be understood that considerable change may be made in the relative construction and arrangement of its parts without departing from the spirit of my invention.

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

1. The combination, with a weight-support and a spring having opposite legs suitably connected to the weight-support, of separate supports secured to the opposite legs of said spring, and an indicator-finger pivoted to one support and connected to the other support by a link pivoted to said support and pivoted to the indicator-finger at a leverage with its point of support, substantially as and for the purpose set forth.

2. The combination of a suspension-support, a spring, a weight-support connected to the spring, a scale or dial, an oscillating indicator-finger, and an adjustable connection to said indicator-finger for rocking the same and indicating the weight applied to the weight-support, substantially as and for the purpose specified.

3. The combination of a U-shaped spring, a weight-support, and connections or links connecting the weight-support to the opposite legs or extremities of the spring, with a scale, an indicator-finger rocked over said scale, and lugs or supports secured to opposite legs of said spring and pivoted to separate points on the indicator-finger, one of which lugs or supports is adjustable for adjusting the indicator-finger, substantially as and for the purpose set forth.

4. In a spring-scale, the combination of a weight-support, a spring having opposite legs suitably connected to the weight-support, an indicator-finger, an adjustable support secured to one leg of said spring and to the indicator-finger, and a link pivotally supported upon the opposite leg of the spring and pivoted to the indicator-finger, substantially as and for the purpose described.

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 12th day of October, 1888.

EDWARD F. BERGMAN.

Witnesses:

A. E. PARSONS,
C. E. TOMLINSON.