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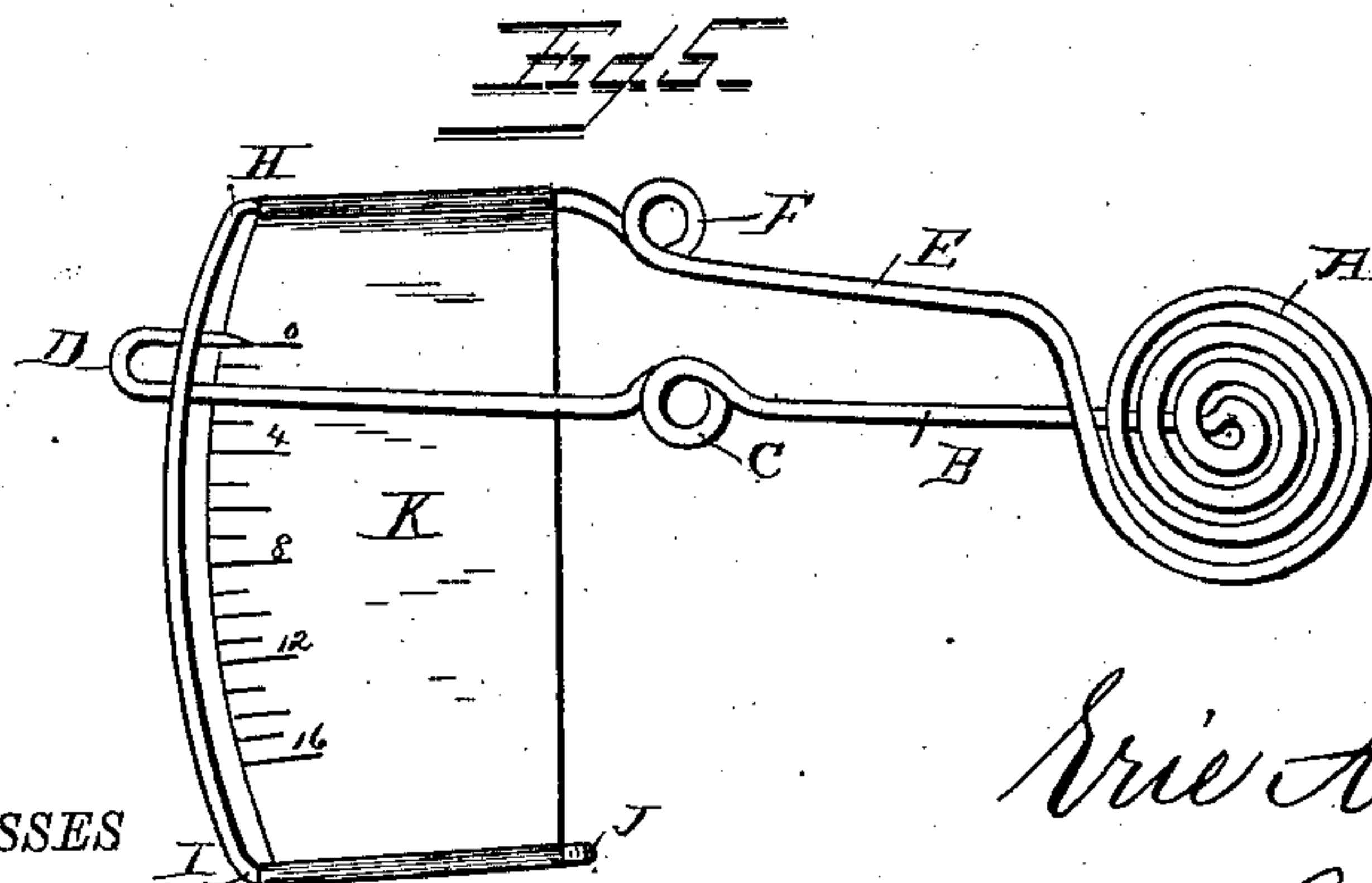
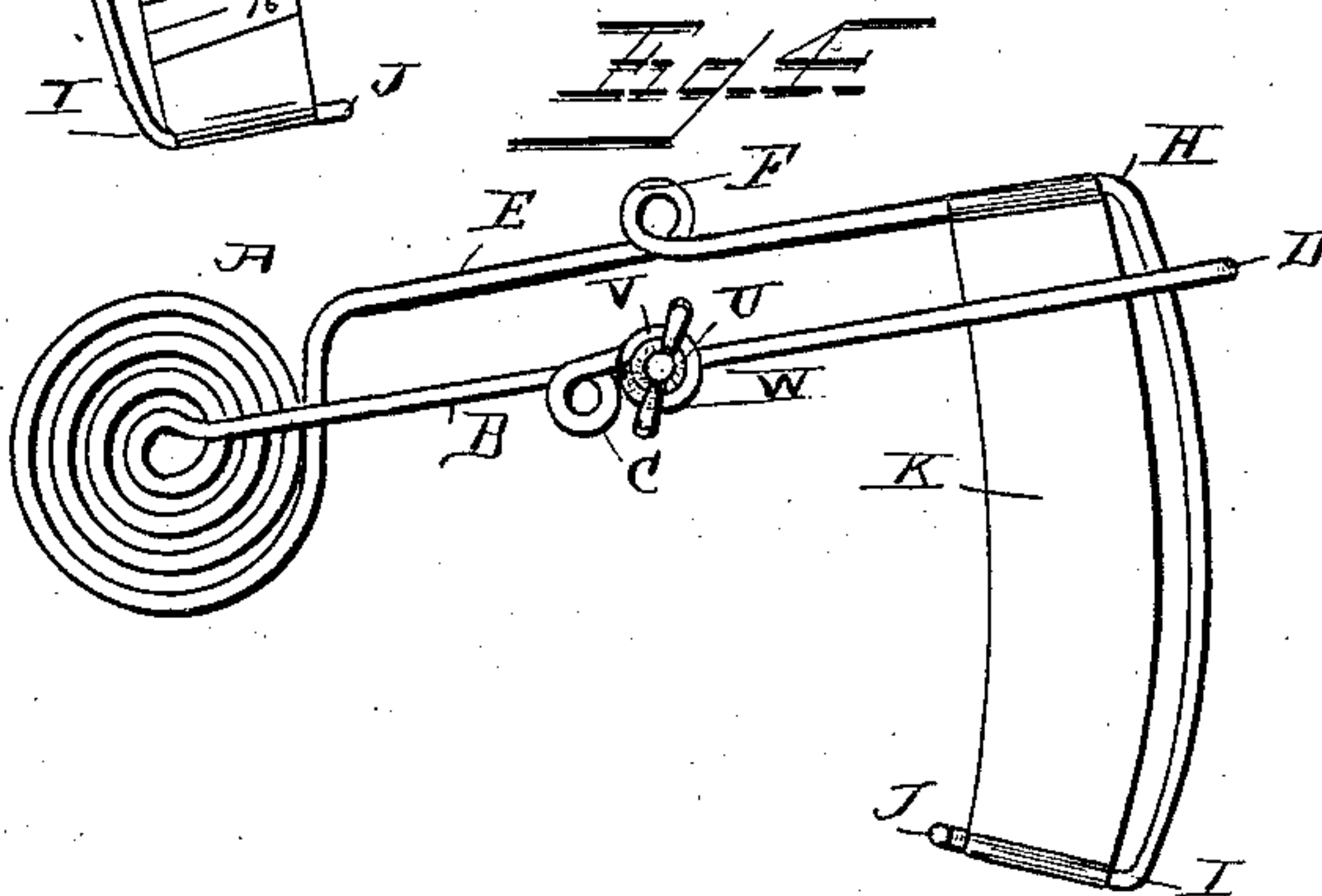
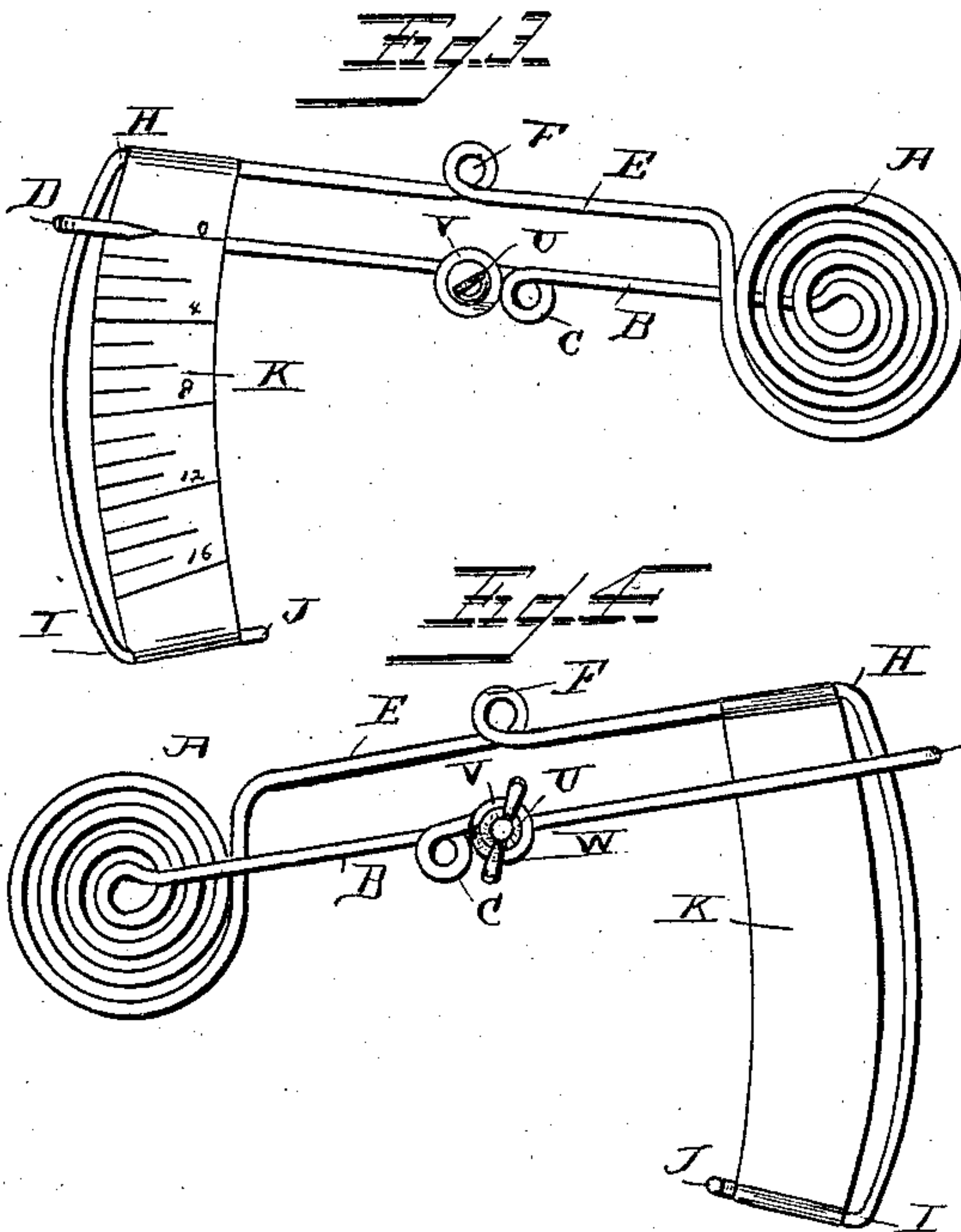
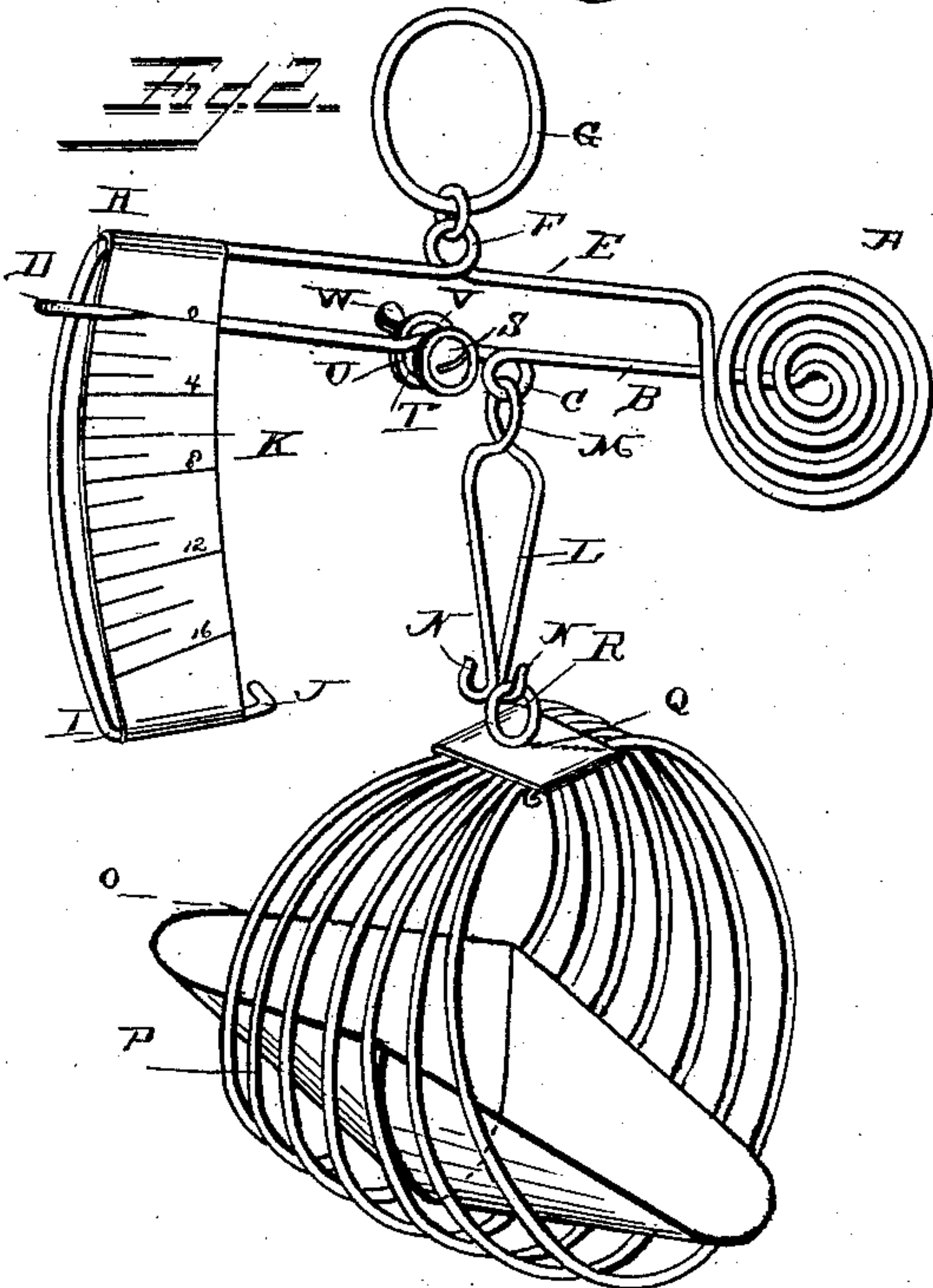
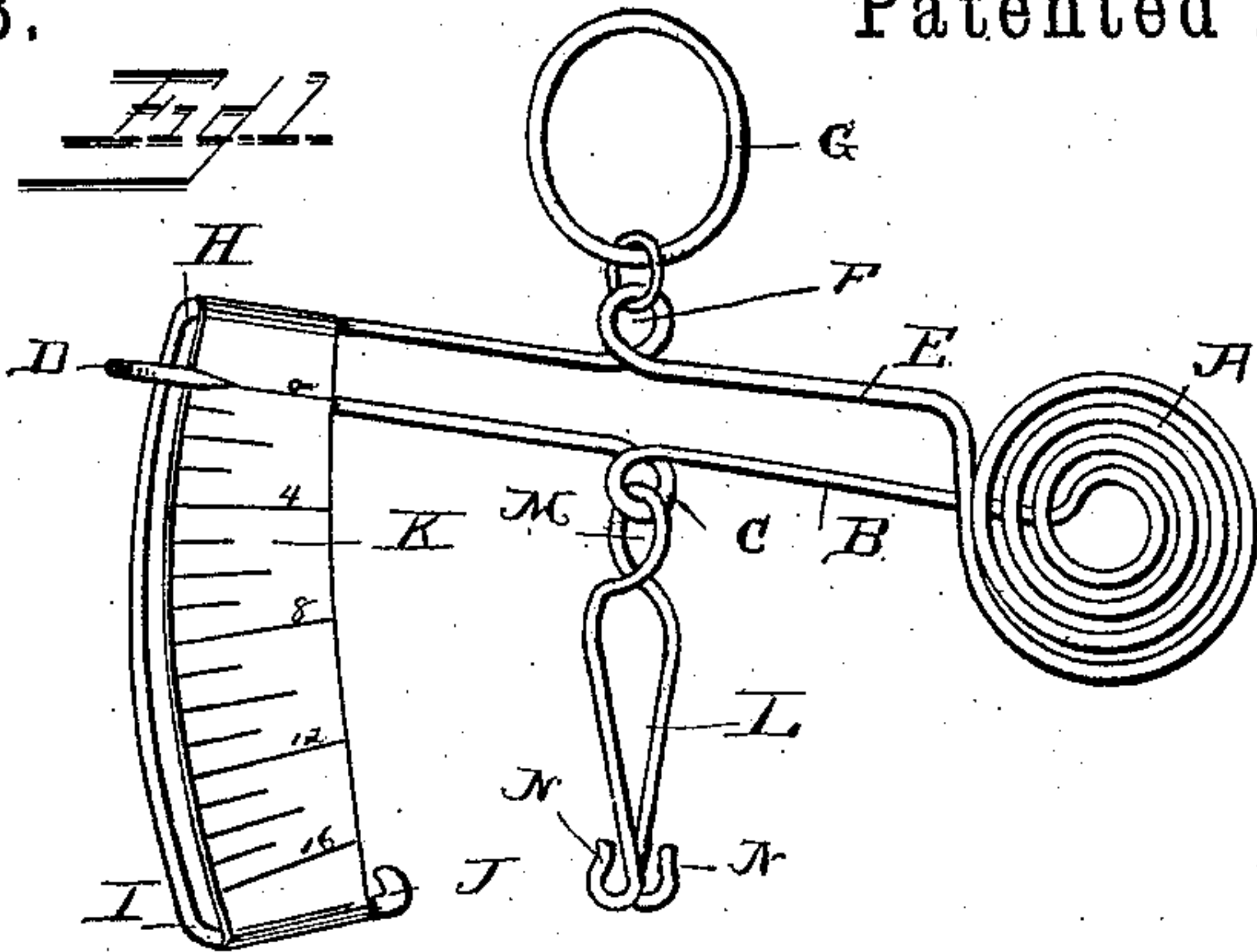
2 Sheets—Sheet 1.

E. A. WITHERELL.

SPRING SCALE.

No. 363,873.

Patented May 31, 1887.



WITNESSES  
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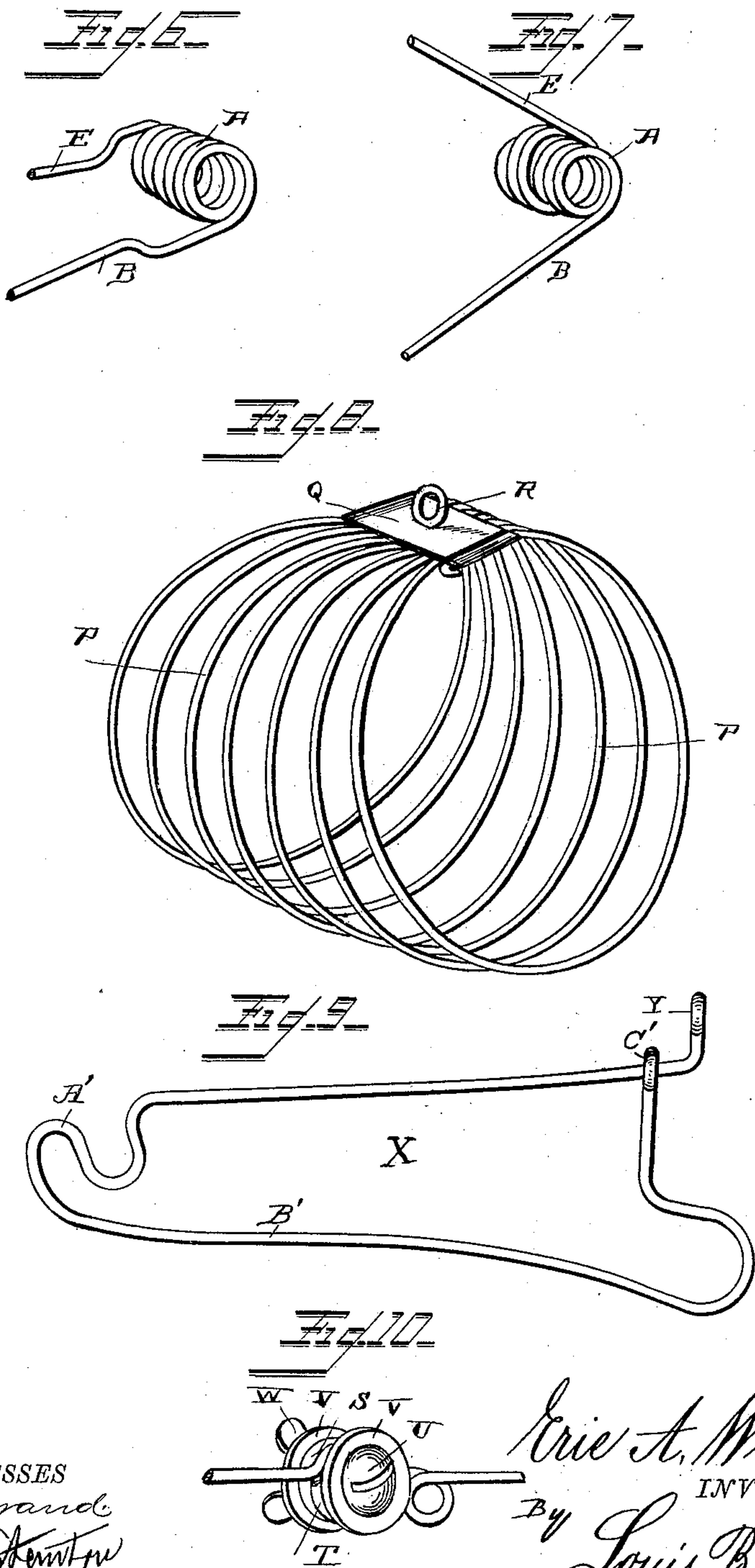
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# UNITED STATES PATENT OFFICE.

ERIE A. WITHERELL, OF DAVENPORT, IOWA, ASSIGNOR OF ONE-HALF TO  
JOHN C. McHART, OF SAME PLACE.

## SPRING-SCALE.

SPECIFICATION forming part of Letters Patent No. 363,873, dated May 31, 1887.

Application filed June 14, 1886. Serial No. 205,103. (No model.)

*To all whom it may concern:*

Be it known that I, ERIE A. WITHERELL, a citizen of the United States, and a resident of Davenport, in the county of Scott and State of Iowa, have invented certain new and useful Improvements in Spring-Scales; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a perspective view of my improved spring-scale, showing it adapted to weigh letters and similar small parcels. Fig. 2 is a similar view showing a scale provided with a scoop and with means for adjusting the index. Fig. 3 is a side view of the spring, index, and index-plate. Fig. 4 is a similar view from the other side. Fig. 5 is a view of a slight modification in the form of the index and index-plate. Fig. 6 is a view of a modified form of spring-coil. Fig. 7 is a similar view of another form. Fig. 8 is a perspective view of the scoop-holder with the scoop removed. Fig. 9 is a side view of the bracket for supporting the scales; and Fig. 10 is a perspective view, on an enlarged scale, of the device for adjusting the index upon the scale-beam.

Similar letters of reference indicate corresponding parts in all the figures.

My invention has relation to that class of spring-scales in which the article to be weighed is suspended from a beam secured at one end of a spring-coil and having an index at its outer end registering with suitable marks upon an index-plate; and it consists in the improved construction and combination of parts of such a scale, as hereinafter more fully described and claimed.

In the accompanying drawings, the letter A indicates a flat wire coil, the inner or central end of which is extended, radiating to one side to form a scale-beam, B, having an eye, C, formed at about its middle for the suspension of the article to be weighed, and having its outer end bent to one side parallel with the beam, forming the index-finger D.

The spring-coil may be a simple spiral coil, as shown in Fig. 6 of the drawings; or it may be a double spiral coil, as shown in Fig. 7, one coil being wrapped around the other.

The outer end of the coil is extended outward to form a suitable main or supporting rod, E, which is formed at its middle with an eye, F, for the attachment of a ring, G, with which it is suitably supported from a bracket or from the hand, and the outer end of this main rod is bent downward, as shown at H, and again bent back, as shown at I, the downwardly-bent portion H being segmental, and the inner end of the inwardly or backwardly bent portion I is bent to one side, as shown at J, forming a stop for the scale-beam when the latter is drawn down by the weight of the article to be weighed.

An index-plate, K, is secured at its upper and lower ends to the outer portion of the main rod and to the inwardly-bent portion I, having the ends folded around the said portions, and the index-finger moves along one face of the index-plate, the said face having a series of figures and marks indicating the deflection of the index and beam when they are drawn down by the weight of the articles to be weighed, and consequently indicating the weight of the articles.

In Fig. 5 is shown a slight modification in the construction of the index and index-plate, the index being bent upward and back parallel to the beam, and the ends of the index-plate being bent to one side, and thereupon wound around the portions of the frame, so that the index and scale-beam will travel between the segmental portion of the frame and the index-plate.

A catch, L, is secured with its upper doubled end in the eye of the beam, the said doubled end forming a round eye, M, having its ends crossing each other, and the ends of the arms of the catch are curved toward each other, forming hooks N N, so that a ring may be engaged by the hooks pointing in opposite directions, the said hooks locking each other. A letter or similar thin parcel may be clamped between the arms of this clamp and weighed in this manner; but when the articles to be weighed become larger and of such a charac-



ter that they require a scoop, I support a scoop, O, of the usual construction, in a cradle formed by a spiral wire, P, gathered at the upper side by means of a metallic strap, Q, which also secures the ends of the spiral, and a ring, R, which is engaged by the hooked ends of the catch, is secured to this strap.

When the scale is used for weighing heavier articles, I construct the portions forming the scale of steel bars or strips instead of wire, and for the purpose of easily adjusting the index to the marks upon the index-plate, placing it at zero when not in use, either when the scoop is supported from the catch or when the article is directly suspended from the catch, or when for some reason or other the index has been disturbed and will not point true, I provide the scale-beam with the device shown in Fig. 10 on an enlarged scale, and in Fig. 2.

The scale-beam is bent to form an eye, S, immediately outside of the eye for the support of the catch, and the index is provided with a corresponding eye, T, at its inner end, and a headed screw-bolt, U, passes through both of these eyes, and is provided with a washer, V, and a thumb-nut, W, for the purpose of clamping the two eyes together.

It will be seen that by loosening the thumb-nut the index may be adjusted to point at its desired mark, and by tightening the nut the index will be clamped in that position, so that it will point correctly.

A bracket for the support of the scale is formed by means of a piece of stout wire, X, having an upwardly-bent eye, Y, at one end, serving for the reception of a fastening screw or nail, and the wire extends thereupon outward, having its outer portion doubled and formed into a hook, A', and the returning portion B' of the wire is curved inward, and thereupon bent upward, having an eye, C', at the extremity of the upwardly-bent end, through which eye passes the upper portion of the wire.

It will be seen that the entire scale is made of wire or metallic rod and sheet metal, and that all the parts of the scale require very little manipulation besides bending, curving, and twisting, the main frame, spring-coil, scale-beam, and index being made out of one piece of wire or metallic rod bent and coiled into its desired shapes.

The beam extending from the center of the flat coil will tighten the coil when drawn downward, and the index being at the end of the beam, while the article to be weighed is supported at about the middle of the beam, the index will travel over a considerably greater space than the point at which the article to be weighed is suspended, so that the index-plate may have comparatively fine graduations for the index, rendering the scale comparatively susceptible for weighing accurately and with fine fractions of weight.

The scale-beam and index will move perfectly free of the segmental portion of the

frame on account of its being carried from the center of the coil at one side of the same, and the index-plate will be directly between the scale-beam and the index-finger.

The scale-beam extending from the center of the coil will cause the tightening or compression of the coil to be comparatively small, so that the coil will not be liable to lose its accurate elasticity by use, but retain the desired elasticity for a long time without impairing the usefulness of the scale, this scale thus overcoming a drawback which has existed in the majority of spring-scales heretofore in use—viz., the spring of the scale becoming slackened by use, and the scale consequently becoming useless and inaccurate.

As shown, the coil may be made in other shapes; but the form shown in the principal figures and described as the preferable form is the most suitable, for the reason given in the foregoing paragraph, although the other forms may be used.

The scoop-supporting cradle being made of a spiral wire secured by the metallic strap, the said cradle may be packed so as to occupy but comparatively little space, and the cradle will at the same time support the entire scoop when spread out, the coils being capable of being laid one upon the other when the scoop is removed and the cradle is packed away.

The bracket for supporting the scale is made out of one piece of wire and may be secured with one screw or nail, and at the same time it will be strong and may be strongly and securely supported by the one nail or screw, rendering the supporting-bracket inexpensive of manufacture and simple in construction and in application.

It will thus be seen that the entire scale may be manufactured at a comparatively low cost, requiring but few and simple materials for its construction, and the construction is so simple that it may be made in a comparatively short space of time, and will be strong and durable, being not liable to get out of order.

The scale may be adapted to weigh heavy or light objects, the diameter of the wire or rod forming the frame, coil, and beam being increased in proportion to the increase of the weight of the articles to be weighed, and by forming the coil or eye upon the scale-beam for the attachment of the scoop nearer to the coil or farther from it the proportion of the movement of the scoop and of the index may be increased or decreased.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a spring-scale, the combination of a flat spring-coil having a scale-beam extending from its central or inner end, formed with an eye for the support of the scoop and with an inwardly-bent index, and having a main rod extending from the outer end, formed with an eye at about its middle for the supporting-ring, and with a downwardly-bent segmental portion, and an inwardly-bent portion at the lower



end of the segmental portion, with an index-plate secured at its ends around the outer end of the main rod, and the inwardly-bent portion of the frame having the end of the scale-beam and the index straddling the segmental portion and the index-plate, as and for the purpose shown and set forth.

2. In a scale, the combination of a beam portion provided with means for supporting the article to be weighed and having an eye at its outer end, an index portion having an index at its outer end and having an eye at its inner end, and a headed screw having a thumb-nut and passing through the eyes of the beam portion and of the index portion, as and for the purpose shown and set forth.

3. In a spring-scale, the combination of a coil having a main rod extending from one end, formed with a downwardly-projecting index-plate, and having a scale-beam projecting from the other end, formed with an eye at its outer end, an index portion having an eye at its in-

ner end and having an index-finger at its outer end registering with the marking of the index-plate, and a headed screw having a washer and nut and passing through the eyes of the beam and of the index, clamping them together, as and for the purpose shown and set forth.

4. A scoop-support for scales, consisting in the combination of a spirally-coiled wire, a metallic plate by means of which the ends and upper portions of the coils of said spiral are brought together and secured, and a ring attached to said plate for connecting said support to the scales, substantially as shown and described.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

ERIE A. WITHERELL.

Witnesses:

GEORGE E. HUBBELL,  
CHARLES H. HUBBELL.