

No. 608,518.

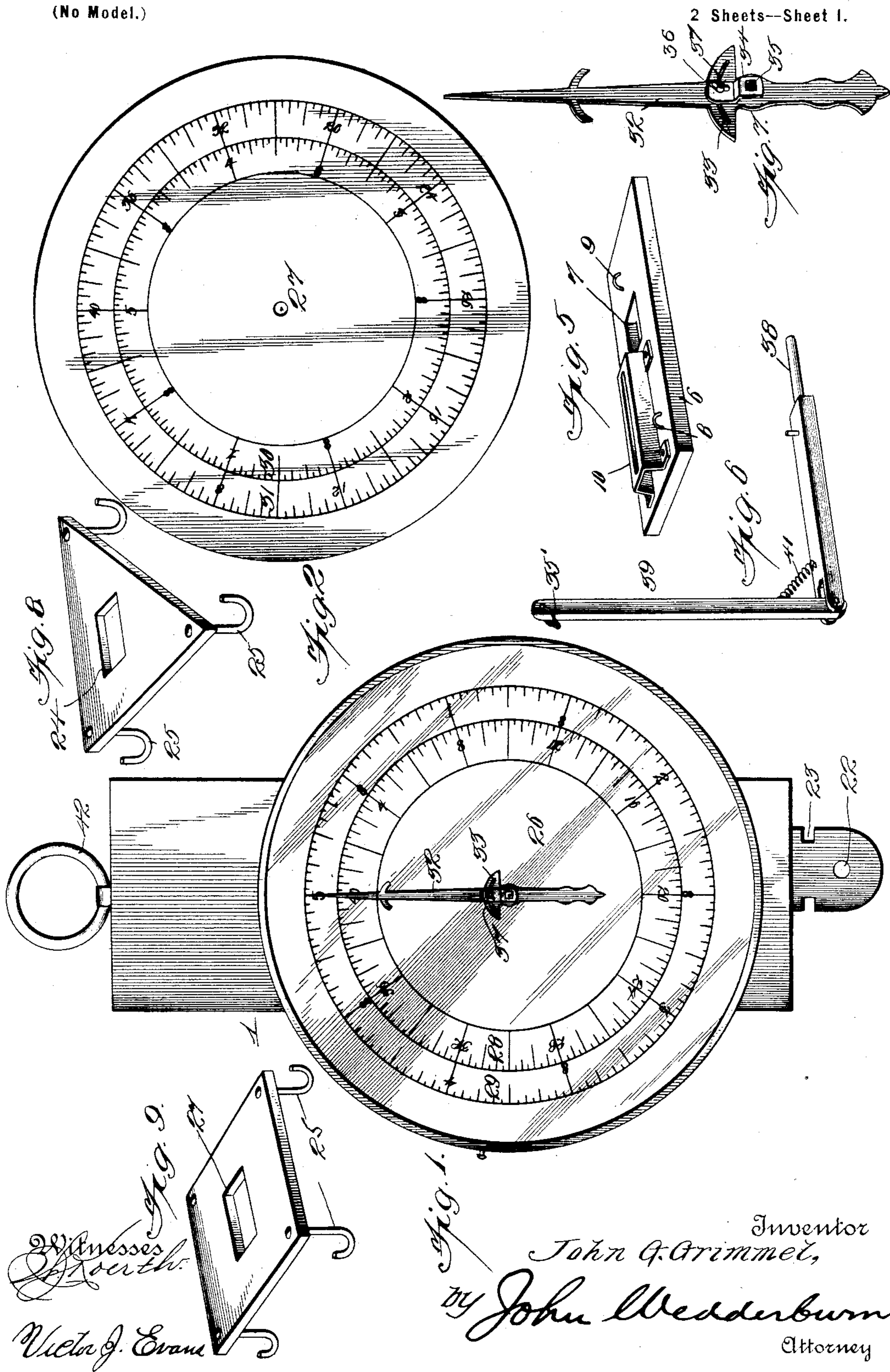
Patented Aug. 2, 1898.

J. G. GRIMMEL.
SPRING SCALE.

(Application filed July 2, 1897.)

(No Model.)

2 Sheets--Sheet 1.



UNITED STATES PATENT OFFICE.

JOHN G. GRIMMEL, OF CHICAGO, ILLINOIS.

SPRING-SCALE.

SPECIFICATION forming part of Letters Patent No. 608,518, dated August 2, 1898.

Application filed July 2, 1897. Serial No. 643,305. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. GRIMMEL, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Spring-Balances; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

10 This invention relates to spring-balances; and it consists, essentially, of two-face scales having devices in connection therewith for changing the balance to weigh articles or substances varying in specific gravity.

15 The invention further consists of the details of construction and arrangement of the several parts, which will be more fully hereinafter described and claimed.

20 The object of the invention is to construct a spring-balance which may be used in weighing light or heavy articles and wherein two scale-faces are employed observable from either side, the parts being simple and effective in their arrangement, strong and durable, 25 and comparatively inexpensive in the cost of manufacture.

In the accompanying drawings, Figure 1 is an elevation of a spring-balance embodying the invention. Fig. 2 is a similar view of the reverse face of the balance. Fig. 3 is a section on the line *x x* of Fig. 4. Fig. 4 is a section on the line *y y* of Fig. 3. Fig. 5 is a detail perspective view of the intermediate plate in the inclosing box. Fig. 6 is a detail perspective view of the connecting-pin. Fig. 7 is a detail perspective view of one of the hands. Figs. 8 and 9 are detail perspective views of suspending devices which are carried by the slide for suspending heavy articles on the said slide. Fig. 10 is a detail perspective view of a modified form of slide and stem.

Referring to the drawings, wherein similar numerals of reference are employed to indicate corresponding parts in the several views, 45 the numeral 1 designates a box or casing having a top plate 2, provided with clips or loops 3, between which a central clip or loop 4 is located, and all located on the under side of the said top plate. The said top plate is rigidly attached to sides 5, in which is mounted an intermediate plate 6, formed with a central slot 7 and opposite clips or loops 8 and 9.

Adjacent to the said clip or loop 8 a slotted retaining-guide 10 is situated, for a purpose which will be more fully hereinafter referred 55 to. The lower ends of the sides 5 are attached to a bottom plate 11, having an elongated slot 12 therein. Attached to the clips 3 are the upper ends of springs 13 and 14, whose lower ends are also connected to the clips 8 and 9, 60 and movably mounted in the slot 7 of the intermediate plate 6 is a stem 15 of a lower slide 16, said stem having rack-teeth 17 on one edge thereof engaging a pinion 18, mounted adjacent to the said plate 6 and having 65 bearings in oppositely-situated plates 19. The said pinion 18 is carried on a shaft or spindle 20 and the ends thereof project through the box or casing. The upper end of the stem 15 is also attached to a spring 21, 70 which is connected at its upper end to the clip 4. The slide moves through the slot 12 in the bottom plate 11, and the lower end thereof has an attaching-eye 22 for the reception of the upper connecting device of the arms of a scale-pan, which is not shown. Above the said eye are recesses 23 for the attachment of suspending devices. (Shown by Figs. 9 and 10.) 75 The said suspending devices are either square or triangular, as shown, or may be otherwise formed, as desired, and have slots 24 in the center thereof and at the corners or angles are provided with hooks 25 for the attachment of heavy weights or pieces of material. 80 In applying the said suspending devices the lower end of the slide 16 is passed through the slots 24 thereof and said devices so arranged as to engage the recesses 23 and rest on the shoulders formed thereby. These devices are stationarily secured and also form a 85 stop for the upward movement of the said slide, as do also other shoulders formed at the point where the stem projects from the slide and which are adapted to engage the bottom side of the plate 6. Over the opposite sides 90 of the box or casing 1 are mounted face-plates 26 and 27, which vary somewhat in their construction. The face-plate 26, which is placed on the right side of the box or casing, has a double scale therein, which for the purpose 95 of illustration consists of an inner scale 28 and an outer concentric scale 29. The inner scale 28 runs from four to forty pounds in regular arithmetical progression, while the 100

outer scale 29 runs from one to five pounds. The division-lines which mark the pounds in the two scales are continuous with each other, and the outer scale also has intermediate marks representing ounces and fractions thereof, while the inner scale is provided with intermediate marks designating pounds and fractions of a pound. The face-plate 27 is situated on the left side of the box or casing and is also provided with two concentric scales 30 and 31. In this plate the inner scale 30 is graduated from one to five pounds and has subdivisions representing ounces and fractions of an ounce and the outer scale from four to forty pounds subdivided into pounds and fractions of a pound, the figures being reversely arranged to those shown by the plate 26. It will be seen that as the hand completely travels over the face of the plate 26 it will designate five pounds in the light-weight scale, and the present form of device is so arranged as to permit a triple rotation, which would amount to fifteen pounds on the said light scale. The same is true with regard to the inner scale—that is, one complete rotation of the hand or indicator will designate forty pounds and a triple rotation would indicate one hundred and twenty pounds on the heavy-weight scale. The scales 30 and 31, carried by the plate 27, would in like manner indicate the same results with a like rotation of the indicator or hand traveling thereover.

It will be observed from the foregoing that the buyer will have one side of the scale presented to him for inspection, while the dealer or seller will observe the other side without examining the face which may be farthest from him, thereby providing means for quickly ascertaining the weight of the material on the scale.

On the projecting ends of the shaft or spindle 20 of the pinion 18 hands or indicators 32 are mounted and have adjacent to their centers segmental slots 33, and between the said hands and the faces over which they move stepped arms 34 are positioned. These arms have square collars, which fit over the square ends of the arbor and are also attached to the said hands or indicators. The outer end of the arm in each instance is provided with a screw-threaded aperture 36, which coincides with a segmental slot 33 and is engaged by a set-screw 37, by means of which the said hands can be regulated or corrected to compensate for a variation in the tension of the springs and adjust the said hands or indicators so that they will stand true when the balance is at rest.

The hands or indicators 32 move together over the oppositely-positioned plates 26 and 27, and from the accompanying drawings it will be seen that the concentric scales on the opposite plates have the designating-numerals reversely arranged to accomodate the movement of the one indicator or hand to the right and the opposite indicator or hand to the left. If both scaled plates had the nu-

merals thereon arranged alike, the one hand would move over the terminating numerals on one scale toward the beginning numerals, which would be confusing. Having the scales relative to the light and heavy weight indications as shown, or so that the light-weighting scale will be on the outside in one plate and the heavy-weighting scale on the inside and the opposite plate with the heavy-weight scale on the outside and the light-weight scale on the inside, not only provides a convenience for observation both to the merchant and buyer on opposite sides of the scale as an entirety, but also assists in quickly ascertaining either a heavy or light weight on opposite sides of the scale without requiring a close scrutiny in either event.

For ordinary light weights used in general merchandise the spring 21 is sufficient to secure a proper operation of the slide 16; but for adapting the balance to heavy weights it is necessary to throw in the auxiliary springs 13 and 14, and for this purpose the stem 15 has an aperture 37 extending therethrough, which is engaged by the inner end of a movable pin 38, mounted in the slotted retaining-guide 10 and having at its outer end an operating-handle or extension 39, and to the latter is attached a chain 35 or analogous device, which is carried out to one side of the plates 26 and 27, between which the said device is located. The face-plates are separated from each other a distance equal to the width of the box or casing 1 and are closed by a suitable sheathing or covering extending from the said box or casing around the peripheries of the said plates. In the outer part of one of the face-plates a slide 40 is mounted and adapted to be moved to gain access to the chain 35 in the space between the face-plates to operate the handle attached to the pin by pulling it down and out against the action of a spring 41, connecting the said handle or extension to the pin, it being understood that the said handle is pivoted to the said pin. When this handle is pulled outward, the pin is adapted to be shoved along through the guide 10 and the stem 15, thereby connecting the plate 6 and all the springs and exerting the tension of the latter on the slide 16 and permitting heavy weights to be connected to the suspending devices carried at the lower ends of the said slides. When the plate 6 is connected to the slide by the pin, the said plate moves outwardly through the box or casing 1 with the said slide when a heavy weight is attached to the lower end of the latter. When it is desired to use the spring 21 alone in connection with the slide 16 and stem 15, the said pin is disconnected from the stem and the handle or extension thereof flies back through its spring attachment to a normal position, which is adjacent to the one side of the box or casing.

It will be understood that glass plates will be mounted over the face-plates 26 and 27 and the frame supporting said plates may be

of any preferred form of construction and the parts of the device as an entirety suitably ornamented to provide a pleasing appearance.

5 To the top of the box or casing 1 is attached a link or eye 42 for sustaining the balance, and it will also be understood that the form of scale-pan may be varied and be either round or square.

10 A modification is shown by Fig. 10 and consists of a sectional stem 43, formed with a hinged joint 44 and carried by the slide 16. The movable part of the said stem is engaged by a flat spring 45, which plays in a recess 46,

15 so as not to form exterior projections, the lower end of said spring being attached to an upper projecting part of the said slide. This arrangement insures continual contact of the rack-teeth on the movable portion of the

20 stem with the pinion 18 and will form a convenient accessory to a proper operation of the balance as an entirety. Either form of stem shown may, however, be employed, and along the opposite sides of the slide suitable cross-

25 marks 47 are placed in vertical alinement and designate the number of pounds in accordance with the revolution of the hands or indicators over the scales, the tension of the springs 13 and 14 and of the spring 21

30 being such under normal conditions as to permit the distention of the slide to the said marks 47 relatively to the rotation of the hands or indicators from one to three times. This also serves as a convenient means of

35 ascertaining the weight of the material or substances placed upon the scale-pan or attached to the slide. It will also be understood that the scales 28, 29, 30, and 31 may be varied to represent larger or smaller quantities, and it is obviously apparent that many

40 minor changes in the details of construction and arrangement of the several parts might be made and substituted for those shown and described without in the least departing from

45 the nature or spirit of the invention.

Having thus described the invention, what is claimed as new is—

1. In a spring-balance, the combination of a slide, a spring connected with said slide, a

50 movable plate through which said slide passes, auxiliary springs attached to said plate, a pin or key for coupling the plate and auxiliary springs with the slide, and means for manually operating the pin or key, substantially as

55 described.

2. In a spring-balance, the combination of a spring-actuated slide having recesses in the opposite edges of the lower end thereof, and a suspending device having a slot therein

60 of the same length as the width of the slide and adapted to have its side walls engage the said recesses, the said suspending device having depending hooks at the opposite angles thereof.

3. In a spring-balance, the combination of 65 a spring-actuated slide having recesses on the opposite edges of the lower end thereof, and a suspending device formed with a central slot to fit over the said slide and to engage the said recesses, said suspending device having 70 depending hooks thereon.

4. In a spring-balance, the combination of a slide having a stem with rack-teeth thereon, a pinion engaging said rack-teeth, having a shaft or spindle projecting from opposite sides 75 thereof, auxiliary springs attached at their upper ends, a movable plate to which the lower ends of said auxiliary springs are also connected and having an opening therein for the free movement of the stem of the slide, scale- 80 plates on opposite sides of the said slide which have a pair of concentric scales thereon reversely arranged on opposite plates, a pin for detachably connecting the auxiliary springs to the slide, hands or indicators connected 85 to the projecting ends of the shaft or spindle of the pinion, and means for operating the said pin.

5. In a spring-balance, the combination of a shaft or spindle, a stepped arm mounted 90 thereon having a screw-threaded aperture therein, a stepped hand or indicator having a segmental slot therein concentric with the projecting end of the said shaft or spindle, a set-screw for securing the adjustment of the 95 said hand or indicator relatively to the said arm and scale-plate, over which the said hand or indicator is adapted to move.

6. In a spring-balance, the combination of a slide, a spring connected to said slide, a mov- 100 able plate through which said slide is adapted to have free operation, auxiliary springs attached to said plate, a detachable pin for connecting the said plate and the auxiliary springs to the slide, a slotted retaining-guide 105 carried by the said slide, a pin movable in the said slotted retaining-guide and adapted to connect the auxiliary springs to the said slide, and a spring-actuated operating handle or extension pivotally connected to the outer 110 end of the said pin and having a pulling device attached to the free end thereof.

7. A scale having a scale-plate with a hand or indicator movable thereover, and a spring-actuated slide with cross-marks thereon to 115 attain an indication relatively to the rotation of the hand or indicator from one to three times and also to ascertain the weight of material placed upon a scale-pan attached to the said slide. 120

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOHN G. GRIMMEL.

Witnesses:

CHAS. S. HYER,
EDWD. B. FOX.