

No. 680,888.

Patented Aug. 20, 1901.

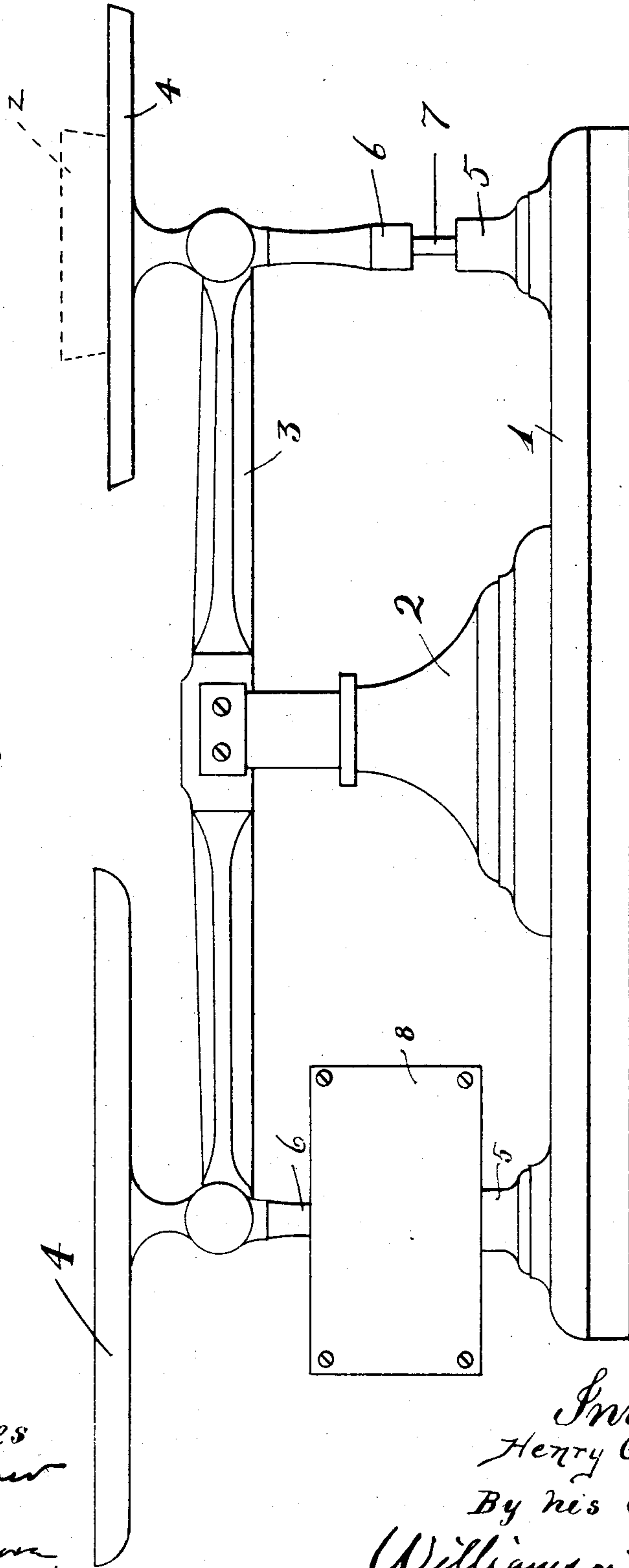
H. G. ROTH.
WEIGHING SCALE.

(Application filed Jan. 28, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



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2 Sheets—Sheet 2.

Fig. 2.

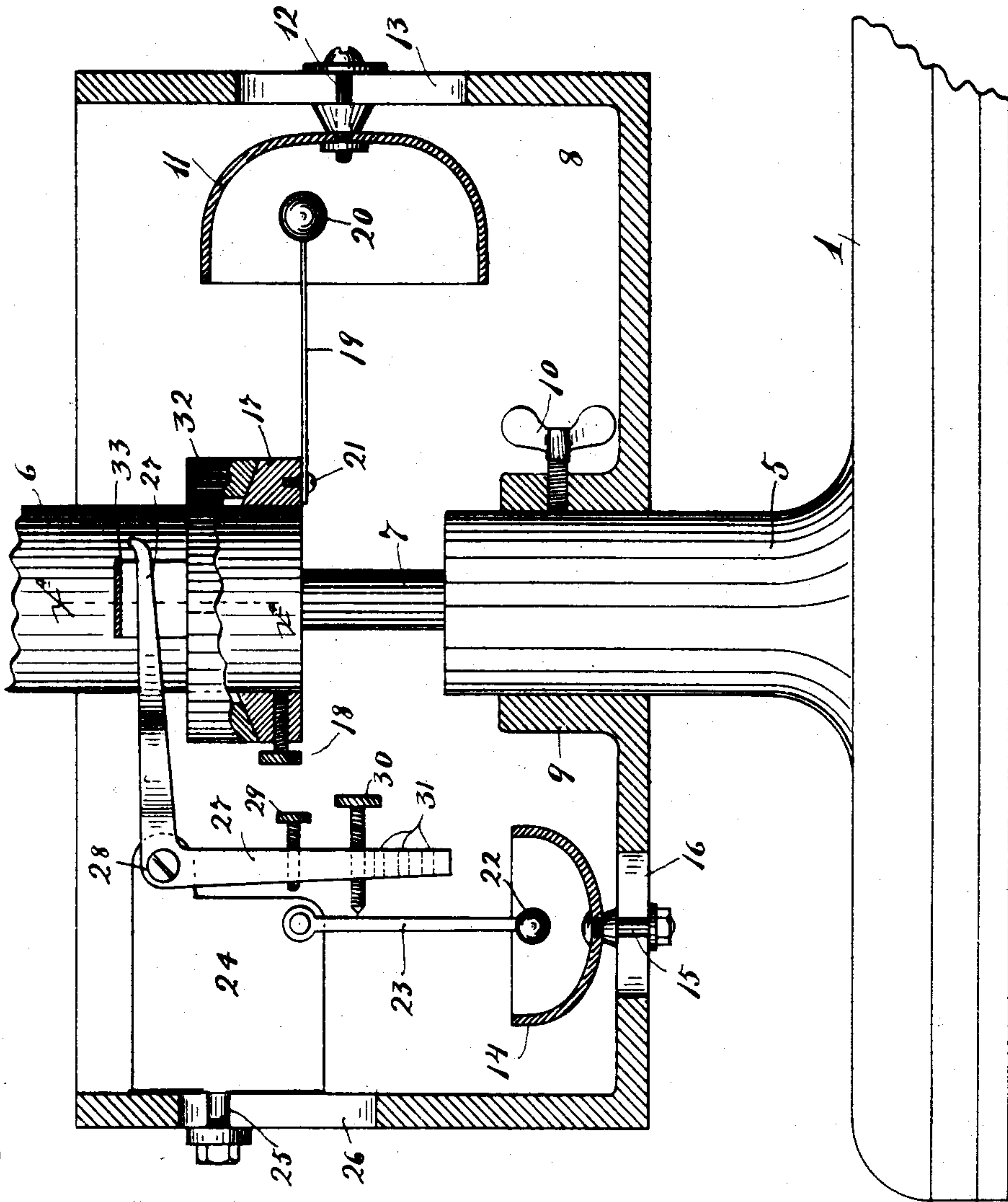
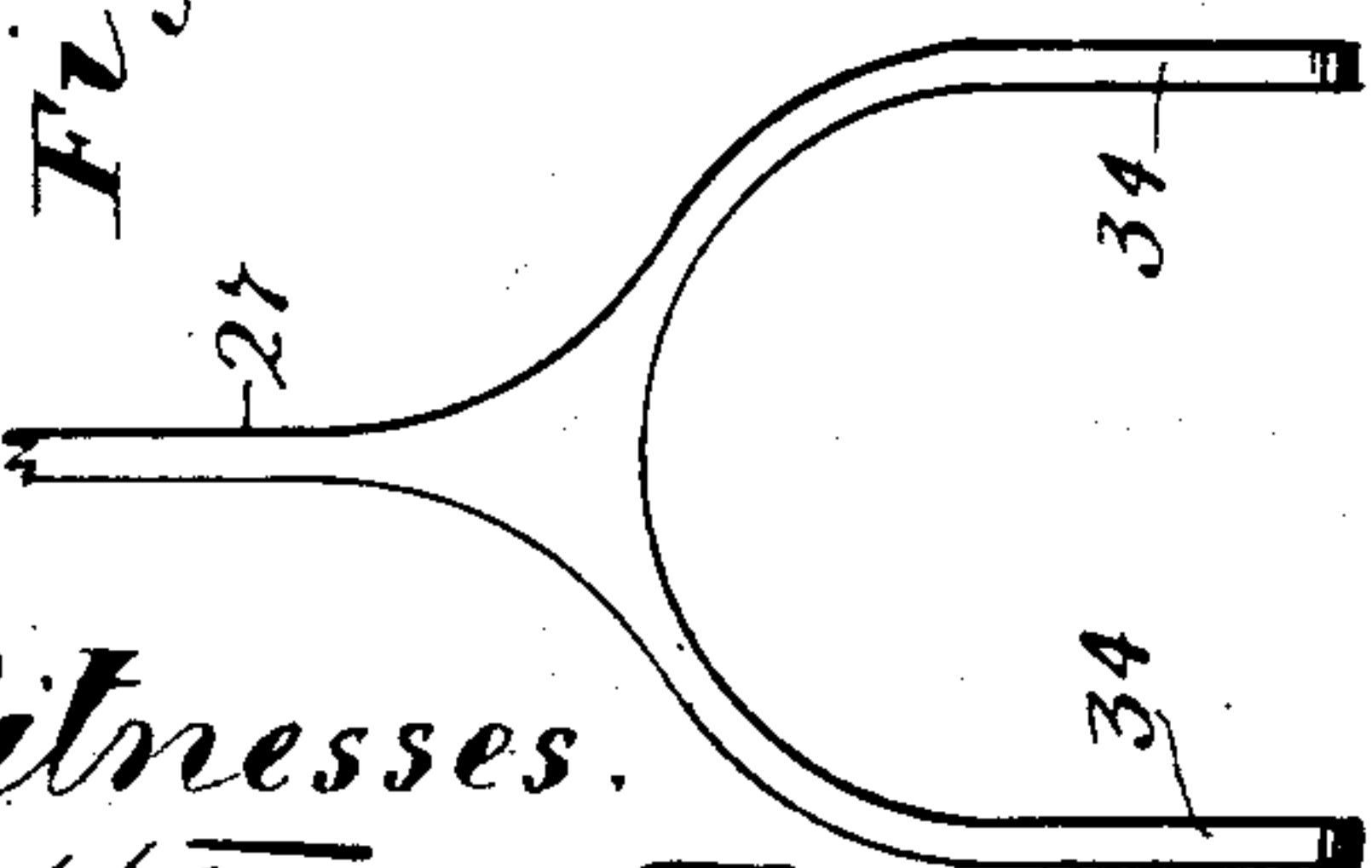
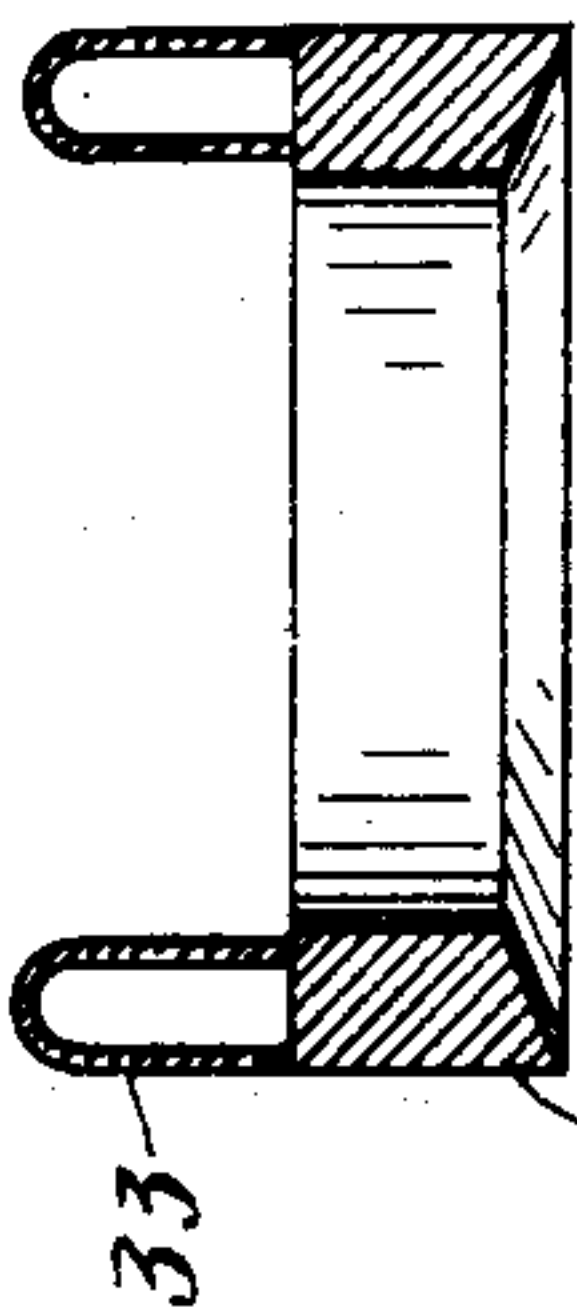


Fig. 3.



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Fig. 4.



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UNITED STATES PATENT OFFICE.

HENRY G. ROTH, OF MINNEAPOLIS, MINNESOTA.

WEIGHING-SCALE.

SPECIFICATION forming part of Letters Patent No. 680,888, dated August 20, 1901.

Application filed January 28, 1901. Serial No. 45,175. (No model.)

To all whom it may concern:

Be it known that I, HENRY G. ROTH, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Weighing-Scales; 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.

My present invention relates to what are known as "gravity-scales," and wherein balancing beams and weights are employed, in contradistinction to scales of the type usually designated as "spring-scales;" and my invention has for its object to improve scales of the type to which it relates in the several particulars hereinafter noted in the specification and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a view in side elevation, showing a weighing-scale of standard construction having applied thereto my invention in its preferred form and arrangement. Fig. 2 is an enlarged view showing a portion of the scale in side elevation and showing in section my improved device, which in the instance illustrated is in the form of an attachment. Fig. 3 is a plan view of a bell-crank-actuating lever, some parts being broken away; and Fig. 4 is a detail through the so-called "counterweighting-ring," taken on the line $x^4 x^4$ of Fig. 2.

Of the parts of the scale illustrated the numeral 1 indicates the base-plate, the numeral 2 the central standard or fulcrum-block, the numeral 3 the balancing-beam fulcrumed on said standard 2, and the numerals 4 4 the trays, of an ordinary balance-beam scale. As is also ordinary in such scales the base-plate 1 is provided near its ends with vertically-projecting guide-sleeves 5, and the trays 4, which are pivoted to the ends of the balancing-beam 3, are provided with depending sleeves 6, through which sleeves 5 and 6 rods 7 work to keep the trays 4 always horizontal in a manner well understood by all persons familiar with this type of scale.

To make the improved device readily attachable to scales already constructed, I preferably employ a rectangular open-topped box 8, which is provided at its bottom with a central hub portion 9. This hub portion 9 is adapted to be telescoped over one of the sleeves 5 of the base 1 and to be there held by a set-screw 10 or other suitable device. To one end of the box 8 a bell 11 is adjustably secured by means of a nutted bolt 12, which works in a vertical slot 13, cut in the said box. Another bell 14 is adjustably secured to the bottom of the box 8 near its opposite end by a nutted bolt 15, which works in the longitudinally-extended slot 16, cut in the bottom of the said box. These bells may of course be otherwise secured. A ring 17 is telescoped onto the lower end of the depending sleeve 6, that directly overlies the sleeve 5, to which the said box 8 is applied. As shown, this ring 17 is detachably held in position by a set-screw 18. For a purpose to be hereinafter noted the upper surface of the ring 17 is beveled or made conical. For coöperation with the bell 11 the spring-stem 19 of a hammer or clapper 20 is secured to the ring 17, as shown, by means of a screw 21. The particular relation of this bell-sounding device 19 20 to the bell 11 and to other parts will be hereinafter stated. For coöperation with the bell 14 a depending hammer or clapper 22 is provided, and, as shown, the stem 23 of said hammer is pivoted to a block 24, secured for vertical adjustments by a nutted bolt or stud 25, which works through a vertical slot 26 in the adjacent end of the box 8. An actuating-lever 27 of bell-crank form is pivoted to a projecting gear 28 of the block 24. In its depending arm the lever 27 is provided with a pair of set-screws 29 and 30. The set-screw 29 is adapted to engage the block 24 to variably limit the outward movement of the depending arm of said lever 27, and the set-screw 30 is adapted to work through any one of a series of screw-threaded perforations 30, formed in the lower end of the said depending lever-arm. By adjustments of the set-screw 30 in any particular perforation the time of action or the sounding of the bell 14 and the force with which the same will be struck may be varied, and by shifting the said set-screw 30 from one to the other of the said perfora-

tions 31 the leverage action of the lever 27 may be varied.

Resting loosely upon and closely fitting the conical upper surface of the ring 17 is an overpoising weighting ring or collar 32, between 5 which and the sleeve 6, which it surrounds, considerable clearance is left. The conical surfaces of the rings 17 and 32 normally serve to keep said ring 32 concentric with 10 and clear of the said sleeve 6. At diametrically opposite points the ring 32 is provided with yoke-like ears or lugs 33, through which prongs 34, with which the upper arm of the bell-crank 27 is provided, project, but nor- 15 mally do not engage.

The balancing-beam 3 will be in perfect balance when it is not subject to a load, to the scale-weights, or to the so-called "overpoising weight or ring" 32, the latter being 20 held upward from its seat on the supporting-ring 17. We will assume that the overpoising weight or ring 32 weighs two ounces. This being so, it is evident that when the said weight or ring 32 rests upon the ring 17 the 25 load end of the balancing-beam 3, which in this instance carries the left-hand tray 4, as viewed in Fig. 1, will be overpoised or overweighted to the extent of two ounces.

Now as a concrete example we will assume 30 that a pound of coffee is to be weighed, in which case a one-pound weight (indicated by the character *z* in Fig. 1) will be placed on the right-hand tray 4, as viewed in Fig. 1. Then the coffee is poured onto the left-hand 35 tray, and as the ring or weight 32 at this time is acting to force the load end of the beam downward to the extent of two ounces it is evident that when fourteen ounces of coffee or load has been placed on the receiving-tray 40 the load end of the balancing-beam 3 will commence to move downward. Under the initial downward movement of the load end of the beam 3 and until the yoke-like ears 33 of the ring 32 are dropped into engage- 45 ment with the prongs 34 of the bell-actuating lever 27 the entire two-ounce weight of the ring 32 is added to the load of coffee or material which has been deposited on the scale. Hence a quick initial movement is given to 50 the scale-beam, which in itself serves to indicate that the desired weight has been reached within two ounces or within the weight of the ring 32, whatever that may be. After a slight initial movement has been 55 given to the scale-beam, as above indicated, the ring or weight 32 will be suspended by the engagement of the lugs 33 with the prongs 34 of the lever 27 and a movement will be imparted to said lever 27, which, unless it be 60 by an extremely slow downward movement of said weight 32, will throw the bell-clapper 22 into contact with the bell 14, thereby sounding the same and drawing the salesman's attention to the fact that the proper 65 weight has been reached within or approximately within the certain predetermined limit. When the loaded end of the balanc-

ing-beam 3 is relieved from the weight of the ring 32, its downward movement will be temporarily interrupted. However, if the load 70 of material being weighed is increased over the weight desired, which is in this illustration sixteen ounces, the loaded end of the beam will be thrown on downward below its 75 balanced position until the lower end of the left-hand sleeve 6 strikes the upper end of the left-hand sleeve 5, by which it will be suddenly stopped. If this downward movement be caused simply by the exact desired 80 weight or by an insignificant trifle of overweight, the hammer 20 will not acquire sufficient momentum to bend its spring-stem 19, and hence will not engage and sound the bell 11; but if this downward movement be caused 85 by any material overweight (such is the adjustment of the parts and the spring of the stem 19) said hammer 20 will strike and sound the said bell 11, thus indicating that overweight is being measured out to the cus- 90 tomer. Now it is further evident that the greater the amount of overweight of the commodity being weighed the more rapid will be the descent of the parts indicated, and consequently the greater will be the 95 force of the stroke of the hammer 20 and correspondingly greater will be the sound produced by the bell 11. Hence the salesman, the proprietor, or any other person after some experience with the device will be able to tell 100 approximately the amount of the overweight simply by the sound of the said bell. The spring-stem 19 will of course throw the hammer 20 out of contact with the bell 11 immediately after it has struck the bell.

It will be noted that the two bells are of 105 different size, and it is the intention that these two bells should have very different tones, so that the sound of the one may be readily distinguished from the sound of the other. Both of the bells in the construction 110 illustrated are adjustably mounted and may therefore be variably set with respect to the hammers or clappers which actuate them. By adjusting the block 24 vertically the ham- 115 mer 22 may be located for proper action on the bell 14 and the upper arm of the lever 27 may be variably set with respect to the overpoising ring or weight 32.

The device when constructed as an attachment, as above described, may be readily ap- 120 plied to standard scales of the character shown, this requiring, in the illustration given, that the scale be partially taken apart. However, the attachment may be applied to 125 scales varying materially in design from that illustrated and may either be in the nature of an attachment or a permanent part of the scale.

The device itself is also capable of many modifications, and the several novel features, 130 such as the bells or alarm devices and the overpoising-weight 32 and associated parts, are not only themselves capable of modification as to construction, but are capable of in-

dividual or independent use in connection with scales of the general type indicated.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

5 1. The combination with a moving part of a weighing-scale, of a spring member carried thereby, and an alarm device comprising a bell and a hammer, one of which parts is relatively fixed, and the other of which is carried
10 by the said spring member and is thrown into action by momentum, substantially as described.

15 2. The combination with a vibrating part of a weighing-scale, of a spring-stem carried thereby, and provided at its free end with a bell hammer or clapper, and a bell located for coöperation with the said hammer and arranged to be struck thereby under the action of momentum, substantially as described.

20 3. The combination with a vibrating part of a weighing-scale, and a stop limiting the extreme movement thereof, a spring-stem carried by said vibrating member, and an alarm device comprising a hammer and a bell, one
25 of which parts is relatively fixed, and the other of which is carried at the free end of said spring-arm and is adapted to be thrown against said coöperating fixed member under

the action of momentum, when said vibrating member strikes its coöperating stop. 30

4. The combination with a scale of the character described involving the relatively fixed sleeve 5 and the movable sleeve 6, of the spring-stem 19 carried by said sleeve 6 and provided at its free end with the hammer 20, 35 and the relatively fixed bell 11 arranged to be struck by said hammer 20 when said sleeve 6 strikes said sleeve 5, substantially as described.

5. The combination with a scale, of a fixed bell and a relatively movable hammer, an actuating device for said hammer, and an overpoising-weight, gravity-held on a vertically-movable part of said scale, normally adding its weight to the other load, and adapted to be thrown upon and supported by said hammer-actuating device, upon the downward movement of the loaded end of the scale-beam, substantially as described. 45

In testimony whereof I affix my signature 50 in presence of two witnesses.

HENRY G. ROTH.

Witnesses:

MABEL MCGRORY,
FRANK D. MERCHANT.