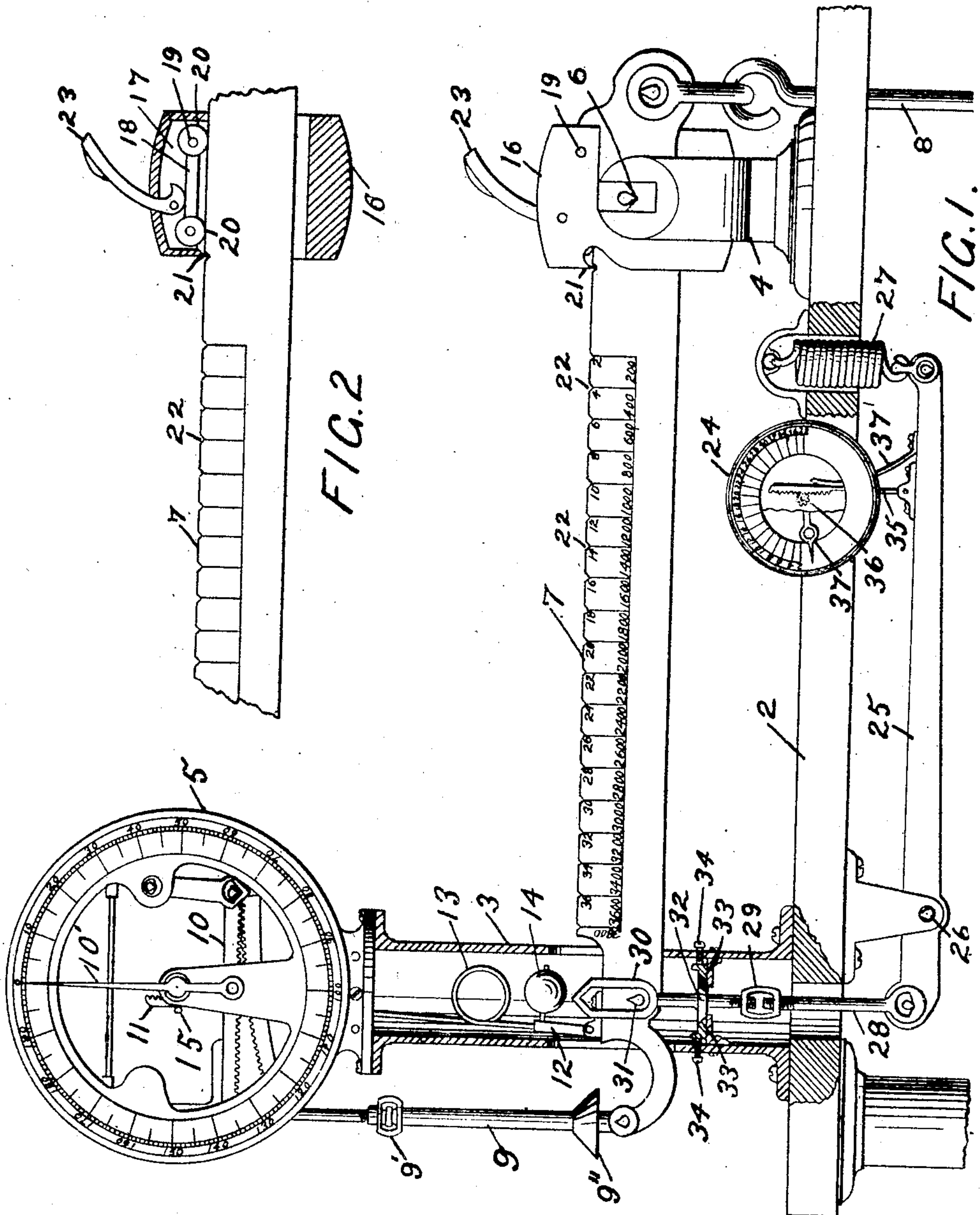


No. 842,576.

PATENTED JAN. 29, 1907.

N. NILSON.
AUTOMATIC WEIGHING SCALE.
APPLICATION FILED APR. 22, 1905.



WITNESSES

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NILS NILSON, OF WAYZATA, MINNESOTA.

AUTOMATIC WEIGHING-SCALE.

No. 842,576.

Specification of Letters Patent.

Patented Jan. 29, 1907.

Application filed April 22, 1905. Serial No. 256,839.

To all whom it may concern:

Be it known that I, NILS NILSON, of Wayzata, Hennepin county, Minnesota, have invented certain new and useful Improvements in Automatic Weighing-Scales, of which the following is a specification.

My invention relates to weighing-scales of the rocker type similar to those shown and described in Letters Patent of the United States No. 643,423 and No. 702,463, issued to me February 13, 1900, and June 17, 1902.

The object of my present invention is to provide means for economizing time and labor in the operation of bringing the scale to a balance.

The invention consists generally in means to enable the operator or person using the scale to determine at a glance the approximate proper position of the beam-weight without the necessity of moving the said weight back and forth on the beam to balance the load on the scale-platform.

In the accompanying drawings, forming part of this specification, Figure 1 is a front elevation, partially in section, of an automatic weighing-scale of the rocker type with my invention applied thereto. Fig. 2 is a detail showing the device for securing the sliding weight on the beam.

In the drawings, 2 represents the base whereon the scale is mounted, and 3 and 4 standards provided on said base, the former supporting the dial 5 and the latter supporting knife-edge pivots 6 of the scale-beam 7. A rod 8 leads from the short arm of said beam down to the scale-platform in the usual way. The long arm of the beam is connected by a rod 9 with a rocker mechanism 10, that forms the subject-matter of a companion application for patent herewith, filed May 9, 1905, Serial No. 259,542, and need not be specifically described or illustrated herein. The dial 5 is graduated in the usual way, preferably up to two hundred pounds, and an indicator 10' is mounted on said dial and arranged to move back and forth over the same, being actuated by a rack-bar 11, that has a pinion connection (not shown) with the post of said hand, as is shown in the companion application referred to. An adjusting device 9' is provided in the rod 9 to facilitate the adjustment of the indicator-hand at zero without the necessity of moving it from its post. I also provide a weight-support 9'' on the rod 9 for carrying an

auxiliary weight, the purpose of which is fully described in said companion application. An arm 12 is pivoted on the scale-beam, and is connected by a spring 13 with the bar 11, said spring serving to relieve the wear or shock on the hand resulting from the sudden arrest of its movement. A weight 14 is carried by the arm 12 to hold the bar 11 in engagement with the indicator-pinion. A stop-pin 15 acts as a guide for said bar and limits its movement away from the pinion. A sliding weight 16 is arranged on the scale-beam and is provided above said beam with a housing 17 for a carriage 18, that is pivoted at 19 in said housing, and is provided with antifriction-rollers 20, that are adapted to rest and travel upon the upper edge of said beam. One end of said housing is provided with an edge 21, adapted to enter notches 22, provided in the top of the scale-beam opposite the graduations on the face thereof. A cam-lever 23 is also pivoted in the housing 17 and arranged to engage the carriage 18 and when depressed raise the said edge 21 out of the notch 22 to allow the scale-weight to be moved back and forth on the beam. When the cam-lever is raised, the edge 21 will be allowed to drop into the notch in the beam and lock the weight against accidental movement.

In a scale of this kind considerable time and energy are wasted in moving the scale-weight back and forth on the beam to balance the scale after the load has been placed on the platform. In weighing loads up to two hundred pounds the indicator-hand will point to the proper graduation and indicate the correct weight of the load on the scale-platform without the use of any secondary or auxiliary indicating device. When, however, the limit of the indicating-dial has been passed, the operator will find it necessary to guess at the proper position of the scale-weight on the beam and move it first one way and then the other until the proper location has been determined. To obviate all this difficulty and objection to the use of a weighing-scale as ordinarily constructed, I provide a secondary indicating device consisting of a dial 24, arranged, preferably, on the base beneath the scale-beam and provided with a beam 25, pivoted at 26 beneath the base and having its lower arm connected with said base by a stiff coil spring 27 and its short arm provided with a rod 28, preferably

formed in two sections adjustably connected by a turnbuckle 29 and the upper section having a loop 30, inclosing a knife-edge 31 on the scale-beam proper. This loop is sufficiently large to be normally out of contact with the knife-edge at all points, and when the scale is used for weighing loads less than or up to two hundred pounds the knife-edge will remain out of contact with the loop, rising and falling therein with the movement of the scale-beam, the upper section of the rod being held in proper alinement by means of a beveled-edge disk 32, fitting between segments 33, that are adjustable by means of set-screws 34. The long arm of the beam 25 is provided with a rack-bar 35, pivoted thereon and engaging a pinion 36 on the post of an indicator-hand 37, that is arranged to move back and forth over the dial 24, that is graduated to correspond to the graduations on the scale-beam. The rack-bar 35 is held in contact with its pinion by a spring 37'.

The operation of the scale is as follows: Assuming that the operator desired to weigh a load exceeding two hundred pounds, the object to be weighed is placed on the scale-platform, and the beam will immediately be tilted, raising the knife-edge 31 against the upper end of the loop 30 and operating the beam 25 against the tension of its spring 27 and causing the indicator-hand 37 to travel over its dial and point to a graduation thereon that will represent approximately the weight of the load on the scale-platform. The spring 27 will not, of course, as is well known through the use of spring-scales, remain accurate at all times and maintain a constant ratio in its expansion and contraction. It will be sufficiently accurate, however, to indicate approximately the correct weight, and the operator having ascertained this by a glance at the dial 24 can then set the scale-beam weight at the proper graduation on the scale-beam without loss of time and without the labor of moving the weight back and forth on the beam.

The alining device for the rod-sections 28 will always keep them in proper position and insure the accurate engagement of the knife-edge 31 with its bearing at the upper end of the loop. The time of such engagement can be easily regulated by means of the turnbuckle-adjusting device 29.

I have shown and described my invention, which I may term a "scale-beam-weight finder," as applied to scales of the rocker type, and particularly those of my own invention; but it will be understood that the device is equally well applicable to any type of scale using a scale-beam and a sliding weight.

I claim as my invention—

1. In a scale the combination with a beam, a beam-weight, and means to indicate fractional parts less than what is indicated by the beam-weight, of an indicator to show the ad-

justment to be made in the beam-weight preliminary to ascertaining the weight of the article on the scale, said indicator having a part thereof arranged to be actuated from the beam to cause the indicator to show the adjustment to be made in the beam-weight previous to the beam and fractional indicator being rendered operative to indicate the correct weight of the article being weighed, substantially as described.

2. The combination with a scale provided with a beam, a movable weight thereon, and an indicator to show the weight of the load up to a predetermined point, of an auxiliary indicator having a part arranged to be temporarily engaged by a portion of the beam in the movement of said beam to adapt said indicator to show the position at which the beam-weight should be placed to weigh in excess of said predetermined point and have the weight indicated upon the first-mentioned indicator, substantially as described.

3. In a scale having a beam, and a movable weight, two weight-indicators, one of said indicators being operatively connected with the beam to coact therewith and its movable weight to indicate the weight up to a predetermined point, and the other indicator having a part thereof arranged to be temporarily connected with the beam in the movement of said beam to adapt said indicator to coact with the beam to indicate the adjustment to be made in the beam-weight to weigh in excess of said predetermined point, substantially as described.

4. The combination, with a weighing-scale having a scale-beam and movable weight thereon and mechanism connected with said beam for counterbalancing the load up to a predetermined weight, of a graduated dial, an indicator-hand arranged to travel over said dial and connected with said scale-beam to be actuated by the initial movement thereof and indicating approximately the weight of the load on the scale up to said predetermined weight, and a secondary indicating device inoperative during the initial movement of said beam and becoming operative during its final movement and indicating approximately the proper position of the beam-weight to balance the load on the scale when such load exceeds the weight represented by the graduations of said first-named indicating device.

5. The combination, with a weighing-scale provided with a scale-beam and movable weight, of an auxiliary beam, a spring connecting the long arm of said auxiliary beam with the fixed support, means connected with the short arm of said auxiliary beam and arranged in the path of said scale-beam but normally out of contact therewith and engaged by said scale-beam during its final movement only, a dial having graduations corresponding to those on said scale-beam,

and an indicating-hand operatively connected with said auxiliary scale-beam and arranged to travel over the graduations of said dial, substantially as described.

5 6. The combination, with a weighing-scale having a scale-beam provided with a knife-edge and a movable weight, of an auxiliary beam, a spring connecting the long arm of said auxiliary beam with the fixed support,
10 an adjustable rod connected with the short arm of said auxiliary beam and having a loop at one end inclosing said knife-edge and normally out of contact therewith, the upper end of said loop having a bearing for said
15 knife-edge and contacting therewith during the final movement of said scale-beam, a dial having graduations corresponding to the graduations on said scale-beam, and an indicating-hand operatively connected with said
20 auxiliary scale-beam and arranged to travel over said dial and indicate approximately the weight of the load on the scale, for the purpose specified.

25 7. The combination with a scale provided with a beam and movable weight, of an auxiliary beam, means for offering resistance to movement of the long arm of said auxiliary beam, means connected with the short arm of said auxiliary beam and located in the
30 path of said scale-beam, a graduated dial, and an indicator operatively connected with said auxiliary scale-beam and arranged to travel over the graduations of said dial to indicate the position at which the beam-weight

should be placed in the operation of weighing, substantially as described. 35

8. The combination with a weighing-scale having a beam and movable weight, of an auxiliary beam having a counterbalancing device at one end, means connected with the
40 other end of said auxiliary beam and arranged to be operated by the movement of said scale-beam at a predetermined point, and a suitable indicator connected with said auxiliary beam and actuated from the weight-
45 beam to indicate the position at which the weight should be placed on its beam in weighing beyond a predetermined point, for the purpose specified.

9. The combination with a scale provided
50 with a beam and movable weight, of an auxiliary beam having a counterbalancing device at one end, means connected with the other end of said auxiliary beam and actuated by the final movement only of said
55 scale-beam, and an indicating device operatively connected with said auxiliary beam to indicate the position at which the weight should be placed on its beam to weigh beyond the point at which the weight-beam acts on
60 the auxiliary beam.

In witness whereof I have hereunto set my hand this 14th day of April, 1905.

NILS NILSON

Witnesses:

RICHARD PAUL,
C. MACNAMARA.