N. C. BASSETT.

BALANCING MACHINE.

APPLICATION FILED JULY 22, 1907.

915,718. Patented Mar. 16, 1909.

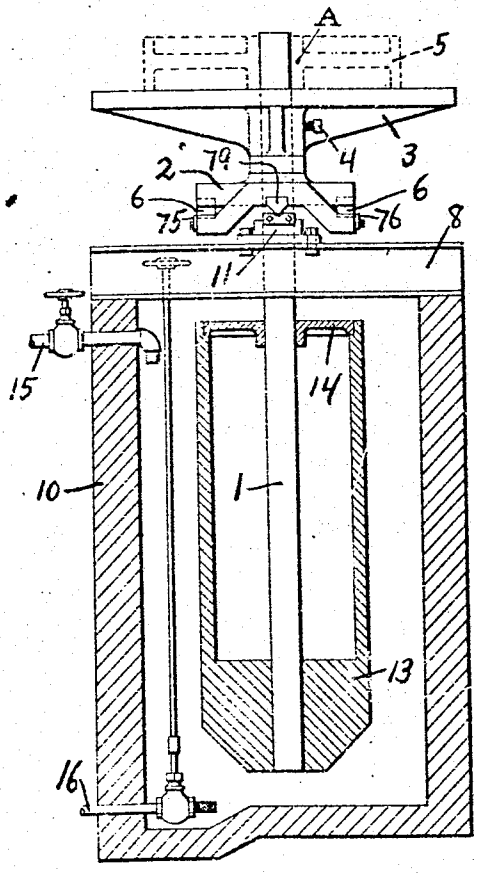


Fig. II.

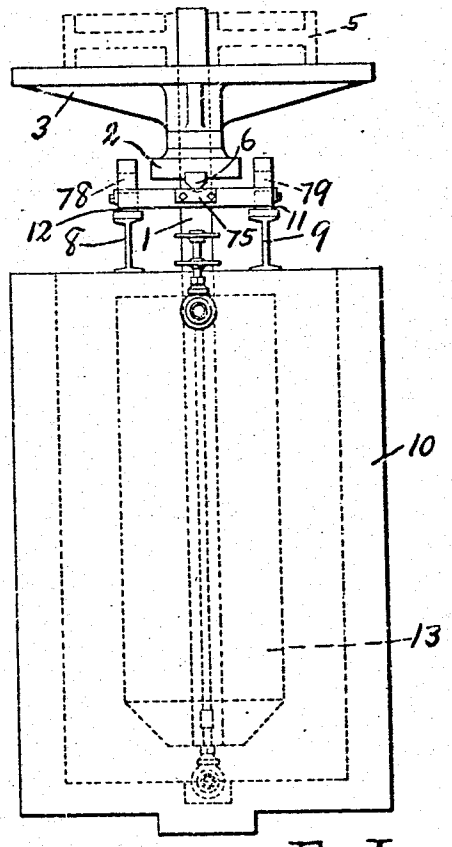


Fig. I.

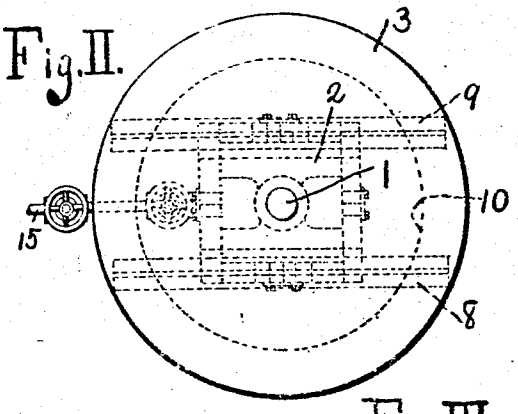


Fig. III.

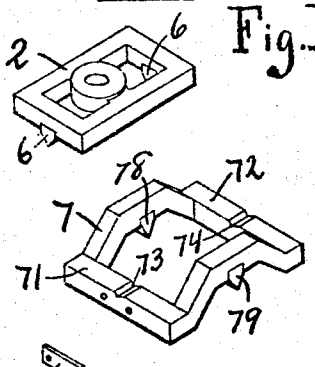


Fig. IV.

WITNESSES:

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UNITED STATES PATENT OFFICE.

NORMAN C. BASSETT, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO ALLIS-CHALMERS COMPANY, OF MILWAUKEE, WISCONSIN, A CORPORATION OF NEW JERSEY.

BALANCING-MACHINE.

No. 915,718. Specification of Letters Patent. Patented March 16, 1909.

Application filed July 22, 1907. Serial No. 384,845.

To all whom it may concern:

Be it known that I, NORMAN C. BASSETT, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a certain new and useful Balancing-Machine, of which the following is a specification.

This invention relates to balancing machines or that class of devices by which the light or heavy side of an object is determined with reference to an assumed axis of the body; and the purpose of this invention is to provide a simple and reliable machine for quickly and easily determining which side of a body is the heavier with reference to the axis of the body.

Reference is made to copending application Serial Number 353,033, filed Jan. 19, 1907, disclosing and claiming broadly certain parts herein disclosed.

Referring to the drawings which accompany this specification and form a part thereof and on which the same reference characters are used to designate the same elements wherever they appear in each of the several views: Figure 1 illustrates in elevation a machine embodying this invention; Fig. 2 illustrates an elevation of the machine taken at right angles to the view as shown by Fig. 1, a part of the machine being shown in section; Fig. 3 illustrates a plan view of the machine; and Fig. 4 illustrates, in perspective, details of three separate parts.

Referring to the drawings, the numeral 1 designates a vertically disposed shaft which is supported by a cross member 2, and upon which is located a support 3, which is adapted to receive the body the balance of which is to be determined. This support 3 is made of a size to accommodate and support the different sized bodies the balance of which it is desired to determine, and preferably it is made as a separate member which is placed upon the shaft 1 and may be secured thereto in any convenient or preferred manner, as by the set screw 4, for example.

The shaft 1 is preferably extended above the upper surface of the support 3 so that the body the balance of which is to be determined, such as the pulley 5, for example, may be placed upon the support 3 with the shaft 1 located within its bore, by which the pulley is accurately centered without difficulty with respect to the machine.

The cross member 2 is provided upon its lower surface with knife edge bearings 6, which are adapted to bear upon the oppositely disposed side members 71 and 72 of a supporting member 7, and preferably are adapted to be received within V-shaped depressions 73 and 74 in said member, and when seated therein it is preferred that they be prevented from being accidentally displaced endwise in said grooves by any suitable mechanism, such as plates 75 and 76, which are secured to said member 7 adjacent the outer ends of the grooves 73 and 74.

The exact construction illustrated for the purpose of preventing endwise movement of the knife edges with respect to the V-shaped depressions is intended to be merely illustrative, and any preferred equivalent form of construction can be adopted without departing from the spirit of this invention, the purpose being to avoid a possible displacement of the knife edges with reference to the member 7, after the parts have been properly assembled without interfering with the normal sensitiveness of the machine. The member 7 is also provided with knife edges 78 and 79 which are adapted to rest upon cross bars 8 and 9, which serve to support the shaft and parts connected therewith. These cross bars are shown by the drawings as composed of I-beams which rest upon the walls of a tank 10 and support the shaft 1 so that its lower part depends into the tank 10.

The I-beams 8 and 9 are preferably provided with hardened bearing blocks 11 and 12 secured thereto, which are provided with V-shaped depressions adapted to receive the knife edges 78 and 79 of the member 7, and retaining pieces shown in Figs. 1 and 2 but not designated by reference characters as these are similar to the retaining pieces 75 and 76 are provided for these bearing blocks, though this construction is not as essential as it is with reference to the member 7.

Secured to the lower end of the shaft 1 is a weighted float 13 which may be formed by casting it upon the end of the shaft 1 and then turning the external surface so that it is perfectly symmetrical, being either cylindrical for its entire length or for the greater part of its length, and the upper open end of the float may be provided with a cover 14.

The numeral 15 designates a pipe provided with a valve by which a fluid, such as water,

may be supplied to the tank 10 to render the apparatus more sensitive on account of the buoyant effect produced by the float 13, and the numeral 16 designates a pipe provided with a valve by which the fluid or water may be withdrawn from the tank 10.

By referring to the drawings, it will be observed that the member 7, the knife edges of which are adapted to rest upon the cross bars 8 and 9, is also provided in a plane at right angles with a plane passed through the knife edges 78 and 79, with the V-shaped depressions 73 and 74, and preferably the bottoms of these recesses are located in the same horizontal plane as the edges of the knife edges secured to the member 7.

When the several parts are assembled as shown by Figs. 1 and 2, it will be observed that the shaft 1 and support 3 are supported upon the cross bars 8 and 9 by a universal or gimbal bearing, by which arrangement any point in the periphery of the support 3 is free to move up or down, and in consequence, if a pulley 5 be placed upon the support 3, and said pulley has its center of mass or center of gravity located at the point indicated by the letter A, the right hand side of the support 3, as shown by Fig. 2, will tip down more or less, depending upon the weight of the pulley 5 and the distance of the point A from the axis of the shaft 1, and on the stability of the machine as affected by the presence or absence of water in the tank 10, and the height at which it stands therein, if present.

The sensitiveness of the machine is intended to be controlled by controlling the amount of water admitted to the tank 10. It is at present considered necessary that some means be provided or some construction be adopted to prevent lengthwise displacement of the knife edges 6 in the V-shaped depressions 73 and 74, such means being provided by the members 75 and 76 because such displacement would change the balance of the machine with respect to the knife edges 78 and 79. If, however, the knife edges 78 and 79 were to shift endwise upon their supports, the balance of the machine would not be affected.

It will be seen that this machine affords a sensitive, simple and efficient apparatus for determining the balance of a body, the only operations which are necessary being to place the body upon the support 3, it being properly centered with respect to the shaft and the sensitiveness of the apparatus being controlled by admitting water to or removing it from the tank 10, the tipping of the apparatus immediately indicating on which side of the axis of the shaft the heavier portion of the pulley, for example, is located.

What I claim is:—

1. The combination with a receptacle adapted to contain a liquid, of a shaft provided with a weight extended into said receptacle, said shaft being provided at its upper end with a support adapted to receive the object the balance of which is to be determined, a support, and a universal bearing so supporting said shaft upon said support that said shaft is free to tip in any direction.

2. The combination with a receptacle adapted to contain liquid, of a shaft provided with a weighted float extended into said receptacle, said shaft being provided at its upper end with a support adapted to receive the object the balance of which is to be determined, a support, a member provided with alined knife edges resting by said knife edges upon said last mentioned support, and a cross member secured to said shaft, said cross member being provided with alined knife edges which rest upon said first mentioned member with its knife edges in substantially the same horizontal plane as the knife edges of said member but disposed substantially at right angles thereto.

3. The combination with a receptacle adapted to contain a liquid, of a shaft provided with a weighted float extended into said receptacle, said shaft being provided at its upper end with a support adapted to receive the object the balance of which is to be determined, a support, a member provided with alined knife edges resting by said knife edges upon said last mentioned support, a cross member secured to said shaft, said cross member being provided with alined knife edges which rest upon said first mentioned member with its knife edges in substantially the same horizontal plane as the knife edges of said member but disposed substantially at right angles thereto, and means to prevent the displacement of said knife edges.

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

NORMAN C. BASSETT.

Witnesses:
H. C. Case,
Frank E. Dennett.