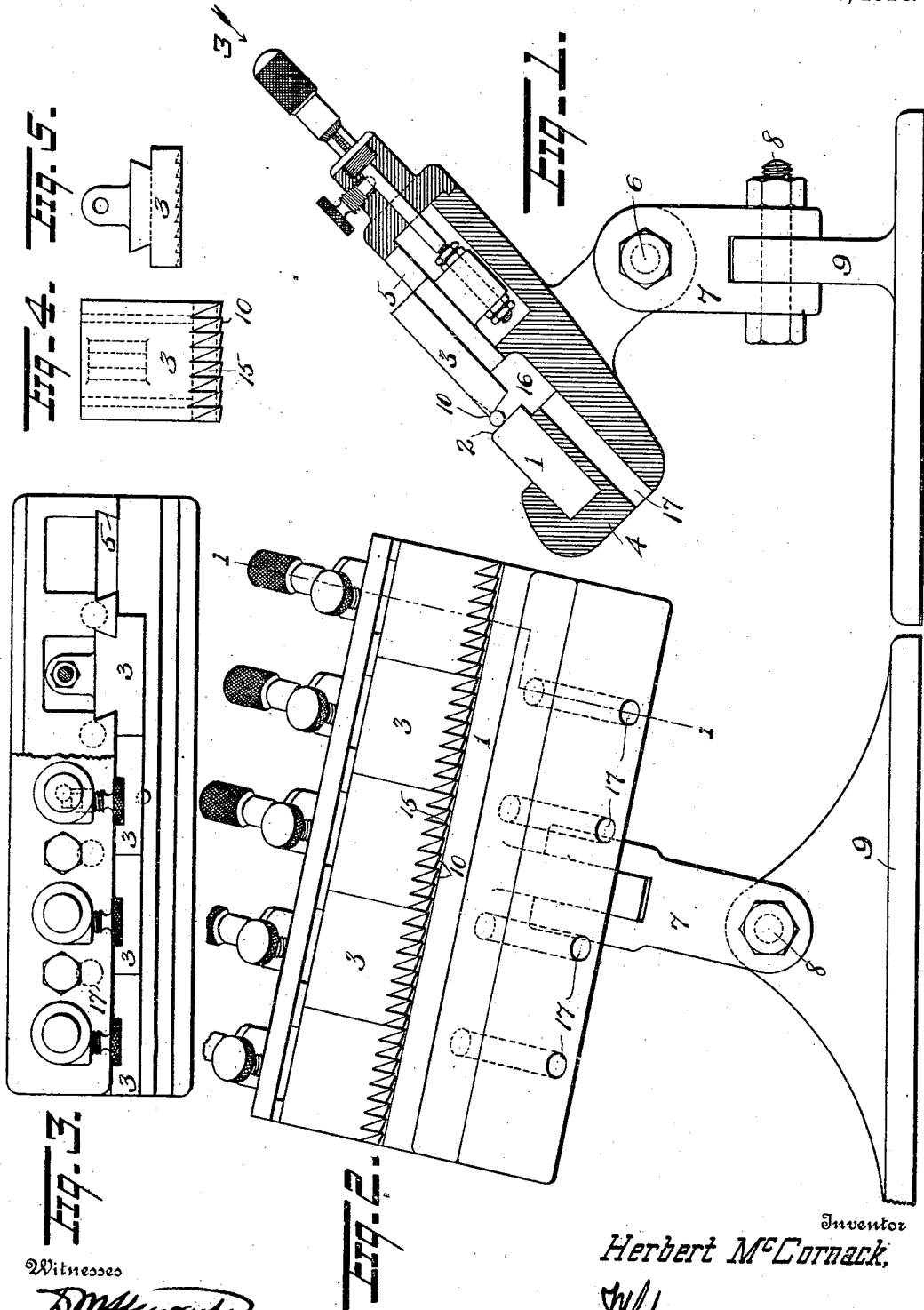


H. McCORNACK.
MACHINE FOR MEASURING AND ASSORTING BALLS.
APPLICATION FILED AUG. 14, 1908.

951,254.

Patented Mar. 8, 1910.



Witnesses

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MACHINE FOR MEASURING AND ASSORTING BALLS.

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Specification of Letters Patent.

Patented Mar. 8, 1910.

Application filed August 14, 1908. Serial No. 448,469.

To all whom it may concern:

Be it known that I, HERBERT McCORNACK, a citizen of the United States, and a resident of West Chester, in the county of Chester and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Measuring and Assorting Balls, of which the following is a specification.

My invention relates to improved mechanism adapted particularly for automatically calipering and assorting steel balls so as to insure such close uniformity as is practically requisite for use in high class machinery.

To this end my invention provides for an inclined ball race-way comprising means adapted to impart a lateral turning movement to the rolling balls whereby the latter are differently presented to calipering means at successive portions of the race-way for an improved calipering means for the rolling balls; and for other novel features as hereafter fully described in connection with the accompanying drawings and specifically pointed out in the claims.

Figure 1 is mainly an end view, with certain parts shown in cross-section on the line 1—1 of Fig. 2, of a machine embodying my invention in preferred form; the lateral incline only of the race-way plane or flat bed being indicated. Fig. 2 is mainly a front elevation of the same indicating the longitudinal inclination of the race-way. Fig. 3 is a plan view looking in the direction of arrow 3 Fig. 1, certain of the removable parts being omitted. Figs. 4 and 5 are separate views of one of the calipering side-retainer sections as preferably employed.

The ball race-way which constitutes the main distinctive feature of my invention, is formed, as shown, by a bar 1 having a plane surface 2 which serves as the inclined ball-supporting bed or plane of the race-way; and by an adjustable side-retainer 3 for the balls, against which the latter are lightly pressed by gravity as they roll longitudinally upon the supporting bed or plane 2. As indicated, the separately formed bar 1, is fixedly secured in a recess therefor in the frame 4; and the side-retainer is made up of a number of separately adjustable sections 3, 3, 3, each of which is movably mounted in a suitable guide-way 5 in said

frame and is adapted to serve as a calipering means for the rolling balls upon the plane 2 as hereafter described. To provide for conveniently setting this race-way bed or plane 2 at a proper incline longitudinally to cause the balls placed thereon to roll lengthwise thereof by gravity as desired, and also at a proper transverse incline to cause the rolling balls to contact by gravity with the side-retainers 3 throughout the length of the race-way, the frame 4 is shown as pivotally mounted at 6 on a carrier arm 7, which latter is in turn pivotally secured at 8 to a fixed base 9 so as to swing in a plane at right angles to that in which the frame 4 swings upon the pivot 6; the effect of thus mounting the frame 4 being to permit of independently regulating the degree of incline of the plane 2, longitudinally, and transversely, as may be found most satisfactory in operating the machine.

Each side-retainer section 3, 3, 3, as shown, is adapted to serve both as a calipering device, and as a means of imparting a transverse turning movement to the rolling balls contacting therewith, whereby the presenting of the balls to the calipering action differently at successive stages of their progress on the race-way plane 2 is insured; both of these functions being effected in connection with the retaining action upon the balls whereby they are held upon the plane 2 until properly sized and released. The lower edge 10 of the side-retainer 3 is accurately adjusted toward or away from the plane 2 by means of well known micrometer mechanism, as indicated, which operates to positively adjust the several sections 3, 3, 3, in the frame guide-ways 5; said edge 10 being adjusted to slightly closer position relative to the inclined race-way plane 2 toward the upper end of the latter. The purpose of this adjustment is to permit the smaller sized balls to pass laterally of the inclined plane 2 under the edge 10, as soon as they caliper with the latter; while the larger balls within the allowed limits determined upon, in similar manner pass under said edge 10 at lower points of the plane 2, leaving only such balls as do not caliper at any point of the race-way to discharge at the end of the latter.

In order that the balls may be effectively turned transversely of the course in which

they roll, so as to successively present various diametral points to the calipering means. I provide for changing the points of contact with the side-retainer as they progress; this being accomplished, as shown, by forming a series of serrations 15 in the calipering edge 10 of the retainer 3, whereby a contacting ball is slightly shifted in passing along said edge while at the same time the calipering action is facilitated. As each ball is finally calipered by the retainer edge 10, in its passage down the plane 2, and passes laterally under the latter by gravity, it is delivered into a receiving-way 16 in the frame 4, extending parallel with the race-way plane 2, and is discharged therefrom into its proper receptacle, through an adjacent outlet 17 of a series leading therefrom at different points in its length, which points correspond, as shown, with the separately adjusted side-retainer sections 3, 3, 3.

The general construction and operation of my improved machine is very simple and satisfactory, and it will be readily understood that the details specifically described may be readily modified without departing from the spirit of the invention.

What I claim is:—

1. In a ball measuring machine, a race-way comprising a laterally and longitudinally inclined ball-supporting plane and a longitudinally arranged side retainer, said plane being adapted to contact with the balls on a line below the line of contact with the retainer whereby a lateral turning movement will be imparted to the rolling balls.

2. In a ball measuring machine, a race-way comprising a laterally and longitudinally inclined ball-supporting plane extending across the vertical axis of the rolling balls, and a longitudinally arranged side retainer adapted to contact with the rolling balls on a line above the line of contact with said plane whereby a lateral turning movement will be imparted to the rolling balls.

3. In a ball measuring machine, a race-way comprising a laterally and longitudinally inclined ball-supporting plane and a longitudinally arranged side retainer having a calipering edge adapted to contact with the rolling balls above the line of contact with said plane whereby a lateral turning movement is imparted to the rolling balls.

4. In a ball measuring machine, a race-way comprising a laterally and longitudinally inclined ball-supporting plane ex-

tending across the vertical axis of the rolling balls, and a longitudinally arranged side retainer having a calipering edge adapted to contact with the rolling balls above the line of contact with said plane whereby a lateral turning movement is imparted to the rolling balls.

5. In a ball measuring machine, a race-way comprising a laterally and longitudinally inclined ball-supporting plane, and a calipering side-retainer having a serrated ball-contacting edge.

6. In a ball measuring machine, a race-way comprising a laterally and longitudinally inclined ball-supporting plane extending across the vertical axis of the rolling balls, and a side retainer formed of separately adjustable longitudinal sections having approximately alined calipering edges adapted to contact with the rolling balls above the line of contact with said plane whereby a lateral turning movement is imparted to the rolling balls.

7. In a ball measuring machine, a race-way comprising a laterally and longitudinally inclined ball-supporting plane, and a calipering side-retainer for the rolling balls comprising separately adjustable sections each formed with a serrated ball-contacting edge.

8. A ball measuring and assorting machine comprising a race-way formed by a laterally and longitudinally inclined ball-supporting plane and a side-retainer adapted to contact with the balls above their line of contact with said plane, and a receiving way for the balls extending parallel with and to one side of said race-way and having discharge outlets at different points in the length thereof.

9. In a ball measuring machine the combination with a frame having a ball race-way formed with a ball-supporting plane and a side-retainer for the balls adapted to contact with the latter above the line of contact with said plane, of supporting means for said frame adapted to permit independent adjustment of the lateral and longitudinal incline thereof substantially as set forth.

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

HERBERT McCORNACK.

Witnesses:

ARTHUR P. REID,
EMMA M. McCORNACK.