F. A. NICHOLS.

WHEEL BALANCING APPARATUS.

APPLICATION FILED DEC. 1, 1914.

1,158,712. Patented Nov. 2, 1915.

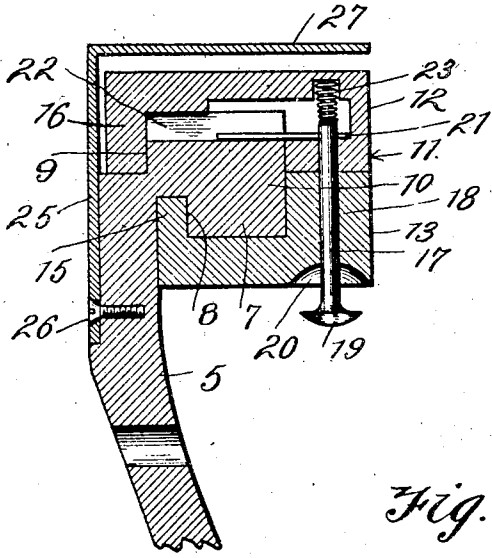


Fig. 3.

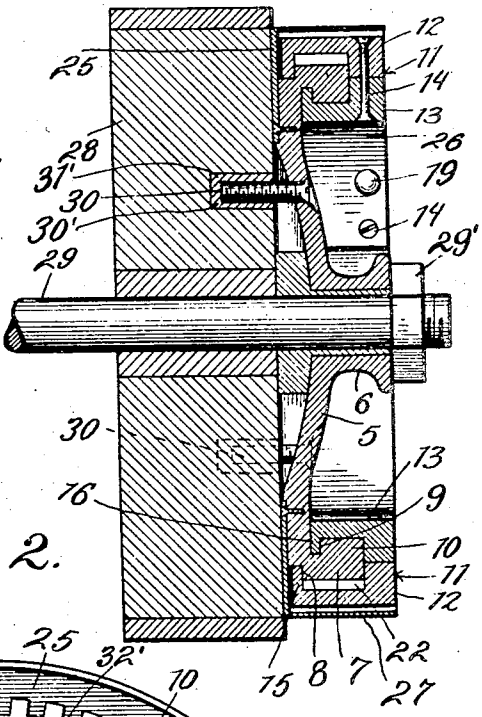


Fig. 2.

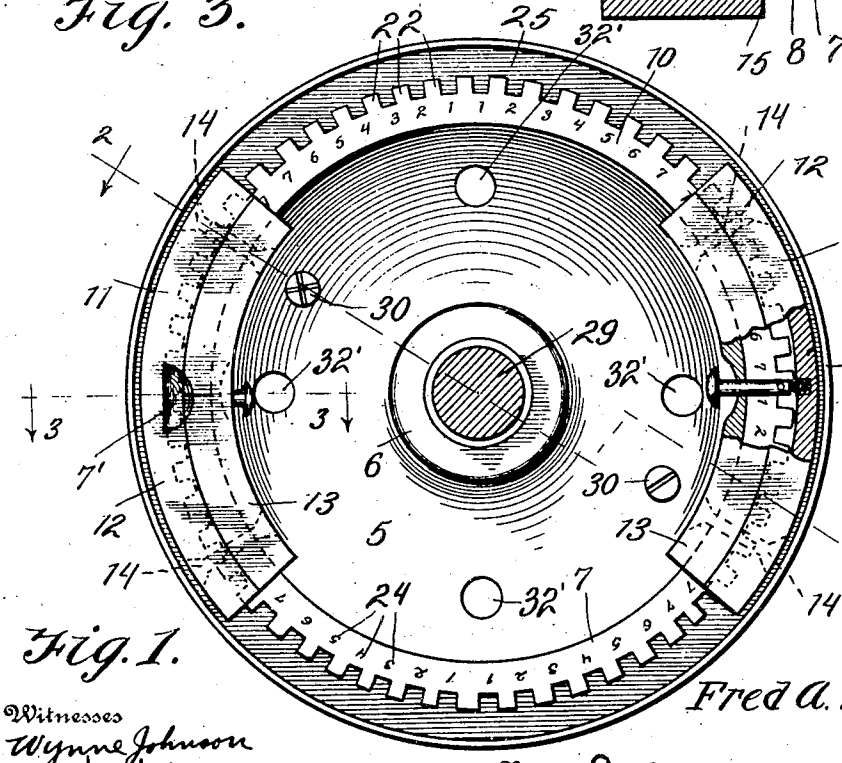


Fig. 1.

Witnesses

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WHEEL-BALANCING APPARATUS.

1,158,712. Specification of Letters Patent. Patented Nov. 2, 1915.

Application filed December 1, 1914. Serial No. 875,032.

To all whom it may concern:

Be it known that I, FRED A. NICHOLS, a citizen of the United States, residing at Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Wheel-Balancing Apparatus, of which the following is a specification.

My invention relates to a balancing apparatus, to be connected with a wheel or other rotating element such as a grinding or polishing wheel, which it is desired to accurately balance whereby the same will rotate smoothly.

An important object of the invention is to provide apparatus of the above mentioned character, which is capable of accurate adjustment, in a highly convenient manner.

A further object of the invention is to provide apparatus of the above mentioned character, which is simple in construction, inexpensive to manufacture, strong, and durable.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same, Figure 1 is a side elevation of apparatus embodying my invention, Fig. 2 is a transverse sectional view taken on line 2—2 of Fig. 1, and, Fig. 3 is an enlarged detail section through a portion of the apparatus, taken on line 3—3 of Fig. 1.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 5 designates a wheel forming the body portion of the apparatus. This wheel is provided with a hub 6, and at its periphery with an annular laterally extending flange or track 7. The annular track 7 is provided with outer and inner annular grooves 8 and 9, forming an annular head 10, as shown.

The numeral 11 designates longitudinally curved weights, which are circumferentially adjustably mounted upon the annular track 7 and have recesses 7′, for the thumb or the like, to enable the same to be conveniently adjusted. Each curved weight 11 is formed of outer and inner weight-sections 12 and 13, which are preferably detachably and rigidly connected by means of radially extending bolts 14, as shown. The inner weight-section 13 has a curved flange or lip 15 extending into the groove 8, while the outer weight-section 12 has a curved flange 16 extending into the groove 9, as shown.

Means are provided to lock each weight 11 in adjustment upon the track 7, the same comprising, as more clearly shown in Fig. 3, a reciprocatory operating bolt or member 17, extending through a radial opening 18, formed through the weight-sections 12 and 13. At its inner end the bolt 17 is provided with an enlarged head 19, adapted to be forced into a recess 20. Attached to the outer end of the bolt 17 is a laterally extending lock-finger or pin 21, adapted to engage and disengage suitably spaced teeth 22, formed upon the head 10, and to fit between a selected pair of these teeth, thus positively holding the weight 11 against movement. The bolt 17 is urged inwardly by a suitably stiff coil spring 23. The head 10 is provided adjacent the teeth 22 with a scale or scales 24, for indicating the extent of movement of the weights 11.

The numeral 25 designates an annular strip, which is attached to the wheel 5, by means of screws 26 or the like. This annular strip is spaced from the outer weight-section 12, whereby the same does not interfere with the longitudinal adjustment thereof. The strip 25 carries a laterally extending annular flange 27, covering the track 7 and associated elements, but spaced therefrom, as shown.

The numeral 28 designates a wheel to be accurately balanced, which for the purpose of illustration may be considered as a polishing wheel, while it is to be understood that the invention is in no sense to be restricted to this use. This polishing wheel 28 is rigidly mounted upon a rotatable shaft 29 also extending through the hub 6 of the wheel 5. There is a nut 29′ carried by shaft 29, to engage the hub 6 and detachably lock the wheel 5 to the wheel 28. The wheel 5 is further detachably connected with the wheel 28 by screws 30 or the like, engaging in tubular plugs 30′, having screw-threaded engagement in openings 31′. The bores of the plugs 30′ are of different sizes and the diameter of the screws 30 to enter the same are of corresponding different sizes. One screw 30 has its head provided with one transverse groove, while the other has two. The numeral 32′ designates openings in the

wheel 5, to receive screws (not shown), to permanently secure the device to a wheel or the like.

In the use of the apparatus, the same is attached to the wheel 28 or the like to be accurately balanced, and the wheel together with the apparatus may be rotatably mounted upon a spindle for adjusting the weights 11. By moving the bolt 17 outwardly, each of the weights 11 may be longitudinally adjusted in either direction and locked in adjustment at the desired position, as is obvious. After the correct balance has been obtained for the wheel such wheel carrying the balancing apparatus may be rigidly mounted upon the spindle or other operating element.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described the invention, I claim:—

1. A wheel balancing apparatus, comprising a body portion provided with a substantially annular track having spaced teeth, a weight circumferentially adjustably mounted upon the track, and a movable locking bolt carried by the weight and provided with a lateral extension to engage and disengage the teeth.

2. A wheel balancing apparatus, comprising a body portion provided with a substantially annular track having spaced teeth, a weight circumferentially adjustably mounted upon the track, a lock device to engage and disengage the teeth and connected with the weight to extend beyond the same in one direction, and means to normally hold the lock device in the operative position.

3. A balancing apparatus for a rotatable member, comprising a wheel to be disposed upon one side of the member, means for attaching the wheel to the member for rotation therewith, a curved flange carried by the wheel and having radially disposed teeth, a weight circumferentially adjustably mounted upon the flange, and a lock member carried by the weight to engage with the teeth, substantially as described.

4. A wheel balancing apparatus, comprising a body portion provided with a laterally extending curved track carrying spaced teeth upon the outer side thereof, a weight circumferentially adjustably mounted upon the curved track and comprising connected weight sections disposed upon opposite sides of the track, a reciprocatory bolt carried by the weight, a lock pin attached to the bolt and adapted to engage and disengage the teeth, and a spring to move the bolt inwardly.

5. A balancing apparatus for a rotatable member, comprising a wheel to be disposed upon one side of the member in concentric relation thereto, means for attaching the wheel to the member for rotation therewith, a curved flange carried by the wheel, a weight circumferentially adjustably mounted upon the flange, and means including a spring pressed element to normally lock the weight against movement upon the flange.

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

FRED A. NICHOLS.

Witnesses:

FRANK A. OVERHOLT,

BUEL L. GORTON.