S. H. HALL.
BOWL SPINDLE BUSHING FOR CENTRIFUGAL MACHINES.
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BOWL-SPINDLE BUSHING FOR CENTRIFUGAL MACHINES.


To all whom it may concern:

Be it known that I, Selden H. Hall, a citizen of the United States, residing at Poughkeepsie, county of Dutchess, and State of New York, have invented a new and useful Improvement in Bowl-Spindle Bushings for Centrifugal Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to means for mounting centrifugal bowls on their supporting and driving spindles. I have observed, particularly with large machines, that, no matter how well the bowl fits at the extreme top of the spindle, if the bottom of the bowl is loose there is liable to be rough running. This is especially the case when there is a deposit of dirt in the bowl heavier at one side than at the opposite side. In many types of bowls there is a bushing at the bottom which, when new, fits the spindle very closely but in use wears until so loose as to make the operation very bad. It is then necessary to send the bowl to the manufacturer for a new bushing.

The object of my invention is to provide means to take up any wear and maintain a tight fit during the entire life of the bowl and spindle as well as to take up any variations in size of the bushings in bowl bottoms.

I accomplish my object by a construction one preferred form of which is shown in the accompanying drawing, which shows a bowl spindle and a cross-section of the surrounding hollow upward extension from the bowl bottom commonly called the nave.

a is a bowl bottom from which the hollow nave extends upward to form a socket which surrounds the upper part of the spindle. b is a taper socket secured in the upper end of the nave and fitting a taper end e on the spindle. c is a bushing having a taper hole and secured to the bottom of the bowl. At the height of the bushing e and surrounding a cylindrical neck f on the spindle and sliding along it, is a collapsible ring g, cylindrical on the inside, but having the outside conical to fit the taper bushing e. The shoulder h and ring i on the spindle limit the upward and downward movements, respectively, of the ring. A spring j between the rings g and i tends to hold the collapsible ring g upward against the tapered surface of the hole in bushing e.

When a bowl is placed around the spindle and lowered, the bushing e contacts with the ring g and forces it downward until the socket b rests around the taper end e of the spindle. The spring j gives enough resistance to downward movement of the ring to cause it to wedge tightly between the spindle and the bushing e.

Because the weight of the bowl holds the socket b down on the taper end of the spindle, there can be no looseness at that point. Because the spring j forces the ring g to wedge between the spindle and the bushing e, there can be no looseness at that point. From the above it may be seen that the geometrical axis of the bowl must always coincide with the geometrical axis of the spindle so that, if balanced to make its axis of rotation coincide with its geometrical axis, it must always run smoothly.

Having now fully described my invention, what I claim and desire to protect by Letters Patent is:

1. In a centrifugal machine, the combination with the bowl and its supporting and driving spindle, of upper and lower bowl-supporting means therebetween, one of which is rigid with the spindle and the other of which is movable downward with the bowl and automatically adjustable in the seating movement of the bowl on its rigid supporting means.

2. In a centrifugal machine, the combination with the bowl and its supporting and driving spindle, of upper and lower bowl-supporting means on the spindle; the lower supporting means comprising a member on the spindle engageable with, and movable downward by, the bowl as the bowl is moved downward into engagement with its upper supporting means and adapted automatically to adjust itself in supporting relation to the bowl.

3. In a centrifugal machine, the combination with the bowl and its supporting and driving spindle, of upper and lower bowl-supporting means on the spindle; the lower supporting means comprising a member on the spindle adapted, as the bowl is moved downward into engagement with its upper supporting means, to engage the bowl, yieldingly resist its downward movement and au-
tomatically adjust itself in supporting relation to the bowl.

4. In a centrifugal machine, the combination with the bowl and its supporting and driving spindle, of upper and lower bowl-supporting means; one of said means comprising complementary wedge-shaped members on the spindle and bowl respectively and engageable with each other as the bowl is lowered toward engagement with the other supporting means, one of said members adapted to yield to allow the bowl to complete the movement required to engage the second supporting means.

5. In a centrifugal machine, the combination with the bowl and its supporting and driving spindle, of upper and lower bowl-supporting means; one of said means comprising complementary wedge-shaped members on the spindle and bowl respectively and engageable with each other as the bowl is lowered toward engagement with the other supporting means, and a spring adapted to yieldingly press said members into tight relationship in the seating of the bowl on the second supporting means.

6. In a centrifugal machine, the combination with the bowl and its supporting and driving spindle, of upper and lower bowl-supporting means; one of said means comprising complementary taper members on the bowl and spindle respectively, one of said members being resistingly collapsible to effect its automatic engagement with the other member in the seating movement of the bowl upon the other supporting means.

7. In a centrifugal machine, the combination with the bowl and its supporting and driving spindle, of upper and lower bowl-supporting means; one of said means comprising complementary taper members on the bowl and spindle respectively, one of said members being collapsible and longitudinally movable, and a spring adapted to yieldingly resist said longitudinal movement and maintain said members in tight engagement.

8. In a centrifugal machine, the combination with a bowl having a nave with a tapered socket in its upper end, of a spindle having a tapered upper end adapted for engagement with said socket, a collapsible tapered bowl-supporting ring sleeved on the spindle and adapted to support the bowl below its nave, and a spring adapted to maintain the ring pressed longitudinally in driving engagement with the bowl.

9. In a centrifugal machine, in combination, a bowl with a nave having a taper socket in its upper end and a taper bushing in its lower end, a spindle having a taper upper end adapted to fit said socket and, at the same height as said bushing, a cylindrical portion substantially smaller than the bushing, a collapsible taper ring adapted to fit around the cylindrical part of the spindle and inside the bushing, and a spring adapted to force the ring toward the small end of the bushing.

10. In a spindle for a centrifugal machine, the combination with a spindle body having a tapered bowl-support at its upper end, of a collapsible tapered bowl-supporting ring sleeved on the spindle below its upper end, and a spring adapted to press the ring longitudinally of the spindle.

11. In a spindle for a centrifugal machine, the combination with a spindle body having a taper upper end, a cylindrical neck substantially below the taper end, and shoulders above and below the neck, of a collapsible ring shorter than the neck having its outside tapered and its inside cylindrical to fit the neck, and a spring adapted to force the ring longitudinally of the spindle in the direction of the smaller end of the ring.

12. In a centrifugal machine, the combination with the bowl and its supporting and driving spindle, of two taper contacts therebetween, one contact comprising two rigid members only and the other contact comprising two rigid members and a wedge member between them.

13. In a centrifugal machine, the combination with the bowl and its supporting and driving spindle, of upper and lower bowl supporting means therebetween, one of which is rigid with the spindle and the other of which is, in the seating movement of the bowl on its rigid supporting means, automatically adjustable to provide a second laterally rigid support.

In testimony of which invention, I have hereunto set my hand, at Poughkeepsie, on this 8 day of July, 1919.

SELDEN H. HALL.