(No Model.)

J. H. HASKINS.

MACHINE FOR CONSTRUCTING JOURNAL BOXES.

No. 422,590. Patented Mar. 4, 1890.

Fig. 1.

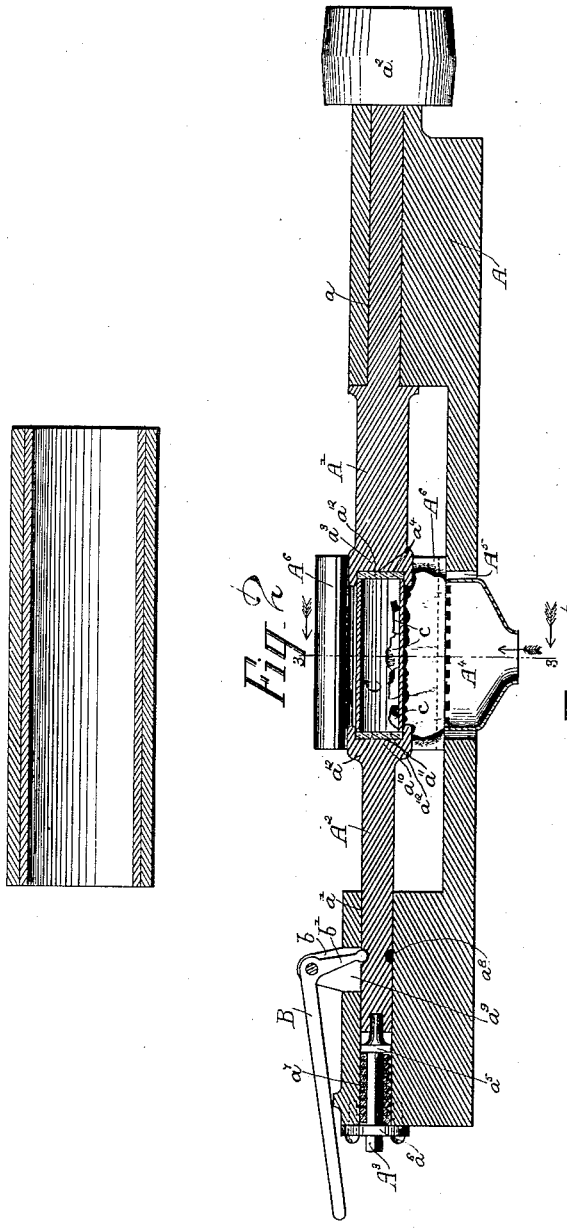

Fig. 2.

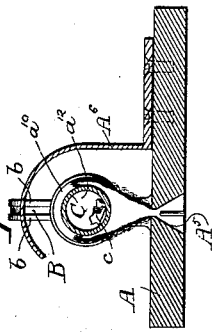

Fig. 3.

Witnesses.-
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By his Attorneys
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UNITED STATES PATENT OFFICE.

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MACHINE FOR CONSTRUCTING JOURNAL-BOXES.

SPECIFICATION forming part of Letters Patent No. 422,590, dated March 4, 1890.

Application filed July 15, 1889. Serial No. 317,605. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. HASKINS, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Apparatus for Casting Linings in Tubular Articles; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to a novel machine or apparatus for constructing composite or lining pieces for journal-bearings of that kind comprising a tubular hard-metal shell having an inner lining or coating of soft metal, such as is shown and described in a separate application for patent, Serial No. 317,606, filed in the United States Patent-Office July 15, 1889.

The machine constituting my invention consists, in its main features, of means for supporting and closing the ends of the hard-metal exterior shell and for giving thereto a rapid rotary motion while the same is heated and the soft metal in a melted state is held within the same, so that the molten metal will be distributed by centrifugal force in a uniform layer about the interior of the shell, and will adhere thereto, the rotary motion of the shell being continued after the molten metal has been distributed therein until the layer or coating cools and becomes hard.

In carrying out my invention the inner surface of the outer shell is commonly treated with hydrochloric acid, or otherwise cleaned, before the soft metal is applied thereto in the manner described, so that the adherence of the soft metal to the surface of the shell will be insured and a permanent and strongly-adherent coating will be formed thereon.

In said drawings, Figure 1 is a central longitudinal section of a finished "brass" or composite lining constructed in accordance with my invention. Fig. 2 is a central vertical longitudinal sectional view of an apparatus adapted for use in carrying out my invention. Fig. 3 is a vertical transverse sectional view of the same, taken on the line 3 3 of Fig. 2.

As shown in said drawings, A indicates a base-plate or supporting-frame provided at opposite ends with journal-bearings a and a' in alignment with each other.

A′ indicates a live spindle or shaft supported in the bearing a, and having a drive-pulley a^2 upon the outer end thereof. The inner end of said spindle is provided with a head or disk a^3, having a circular concentric recess a^4 formed in its inner face.

A^2 indicates a tail-stock supported in the bearing a'. A^3 is a longitudinally-sliding spring-actuated pin located within said bearing a', and bearing at its forward end against the rear end of the said tail-stock. The said pin is provided near its forward end with an annular enlargement or flange a^5, which fits within said bearing a' and guides said pin therein. At its rear portion the said pin projects through an opening in a plate a^6, secured around the rear end of the said bearing a', and is guided thereby. A coiled spring a^7 encircles the said pin A^3 and bears at one end against the plate a^6 and at its other end against the flange a^5. Said spring exerts an expansive force to throw said pin and the tail-stock against which it bears toward the center of the machine. The said tail-stock A^2 is formed with an annular groove a^8 in its rear end portion within the bearing, and a slot or opening a^9 is formed in the bearing adjacent to said groove.

B indicates an actuating-lever pivoted between two lugs b b, arranged on either side of the slot a^9. The said lever is provided with a short arm b', which passes through the said slot a^9 and engages the groove a^8 of the said tail-stock, whereby by operating said lever the short arm thereof will act upon said tail-stock to retract the same against the action of the spring a^7.

Upon the inner end of the tail-stock A^2 a head a^{10} is formed, said head or disk being provided on its inner face with a circular recess a^{11}, which corresponds in size and location with a recess a^4 in the head or disk a^3. Disks a^{12} a^{12}, of asbestus or other suitable incombustible material, are arranged within the said recesses, and serve as a packing for closing the ends of the tubular articles.

A burner A^4, for gas, vapor, or liquid fuel, is located in a slot A^5, formed in the base-plate A adjacent to the inner ends of the spindle and tail-stock.

A^6 indicates a hood secured to the base-plate and overhanging the said ends of said spindle and tail-stock.

In the use of the machine described I proceed as follows: The metal shell C is first thoroughly washed interiorly with any suitable acid, or the same is otherwise thoroughly cleansed. A sufficient quantity of the soft metal in a solid state is then placed within the said shell, preferably in small pieces or fragments *c c*, as shown in the drawings. The actuating-lever B is then operated to retract the tail-stock sufficiently to allow said shell to be inserted between the heads a^3 and a^{10}. The lever is released and the action of the spring a^7 throws inwardly the tail-stock, and the said shell is clamped between the said heads, with its ends resting within the circular recess and against the disks of incombustible material therein. The burner is then lighted to heat the shell, and the latter is rapidly turned by means of a suitable drive-belt applied to the pulley a^2 on the spindle A'. As soon as the temperature of the shell is raised sufficiently to melt the soft metal and the latter becomes molten it is, under the influence of the centrifugal force due to the rotation of the shell, spread out and evenly distributed over the entire interior surface of said shell. When the molten metal has been thus distributed within the shell, the heat is removed therefrom and the rotary motion thereof continued until the soft-metal lining hardens sufficiently to retain its shape, whereupon the shell may be removed from the machine. It is obvious that during the distribution of the molten metal by the centrifugal force the heavier and more solid portions of the same will pass to the outside, excluding the air-holes and forcing the lighter or porous portions of the metal toward the inner surface thereof. After the composite lining or brass thus formed is removed from the machine the inner surface of said soft-metal coating is bored or reamed out, thereby removing the soft or porous portions of the same and forming a smooth cylindric inner surface for the bearing.

It is found that a soft-metal lining or coating applied by centrifugal force and heat to the inner surface of a hard-metal shell, as described, will adhere firmly to the outer shell, and thus form a composite lining having superior durability, owing to the fact that the hard-metal shell affords a firm support for the soft lining and serves to retain the same accurately in cylindric form and prevents distortion of the same, while the adherence of the soft-metal coating to the shell prevents the soft metal from being compressed or forced out of shape, as is liable to occur when there is considerable sidewise strain, pressure, and pounding on the bearing. An adherent coating, furthermore, may obviously be made much thinner than an ordinary cast soft-metal lining, thereby effecting a large saving of the soft metal. The employment of centrifugal force affords a coating having a bearing-surface of superior smoothness and of uniform hardness or density, owing to the fact that the more solid parts of the metal are carried outwardly against the shell, while the more porous parts and those containing impurities and air-holes remain at the inner part of the coating, so that they may be removed by boring or reaming, in the manner hereinbefore stated.

I have shown in the accompanying drawings one form of apparatus by which my invention may be conveniently carried out in practice; but it is to be understood that other forms of apparatus for producing rotary motion and for heating the shell may be used with the same general result and is included in my invention.

I claim as my invenion—

1. The herein-described apparatus for casting linings in tubular articles by centrifugal force, comprising two revolving heads or disks located in alignment with each other, and between which the articles to be lined are held and revolved, said heads or disks being constructed to fit against and close the ends of the tubular articles, and means for heating said articles.

2. The herein-described apparatus for casting linings in tubular articles by centrifugal force, comprising two revolving heads or disks located in alignment with each other and provided with circular recesses in their adjacent faces adapted to receive the ends of the articles to be lined, and means for heating said articles.

3. The herein-described apparatus for casting linings in hollow cylindric articles by centrifugal force, comprising two revolving heads or disks located in alignment with each other, circular recesses in the adjacent faces of said plates, said recesses being provided with a lining or packing of incombustible material, substantially as described.

4. The herein-described apparatus for casting linings in tubular articles by centrifugal force, comprising a revolving head or disk, and a longitudinally-sliding head or disk located in alignment therewith, said heads or disks being constructed to fit against and close the ends of the articles, and means for heating said articles.

5. The herein-described apparatus for casting linings in hollow cylindric articles by centrifugal force, comprising a revolving head or disk, a revolving and longitudinally-sliding head or disk located in alignment therewith, a spring for forcing said sliding disk toward the other, and means for retracting the same, said heads or disks being constructed to fit against and close the ends of the articles, and means for heating said articles.

6. The herein-described apparatus for casting linings in hollow cylindric articles by centrifugal force, comprising a supporting-frame, a shaft supported in bearings therein, a head or disk on one end of said shaft, means for revolving said shaft, a longitudinally-sliding tail-stock supported in bearings in said frame and in alignment with said shaft, a head or disk upon the end of said tail-stock adjacent to the shaft, means for forcing said tail-stock toward said shaft, an annular groove in said tail-stock, a lever pivoted to said supporting-frame having one end in engagement with said groove, whereby said tail-stock can be retracted, and means for heating the articles under treatment, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

JAMES H. HASKINS.

Witnesses:
C. CLARENCE POOLE,
HARRY COBB KENNEDY.