

(No Model.)

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MANUFACTURE OF ANTI-FRICTION BEARINGS.

No. 300,025.

Patented June 10, 1884.

Fig. 1.

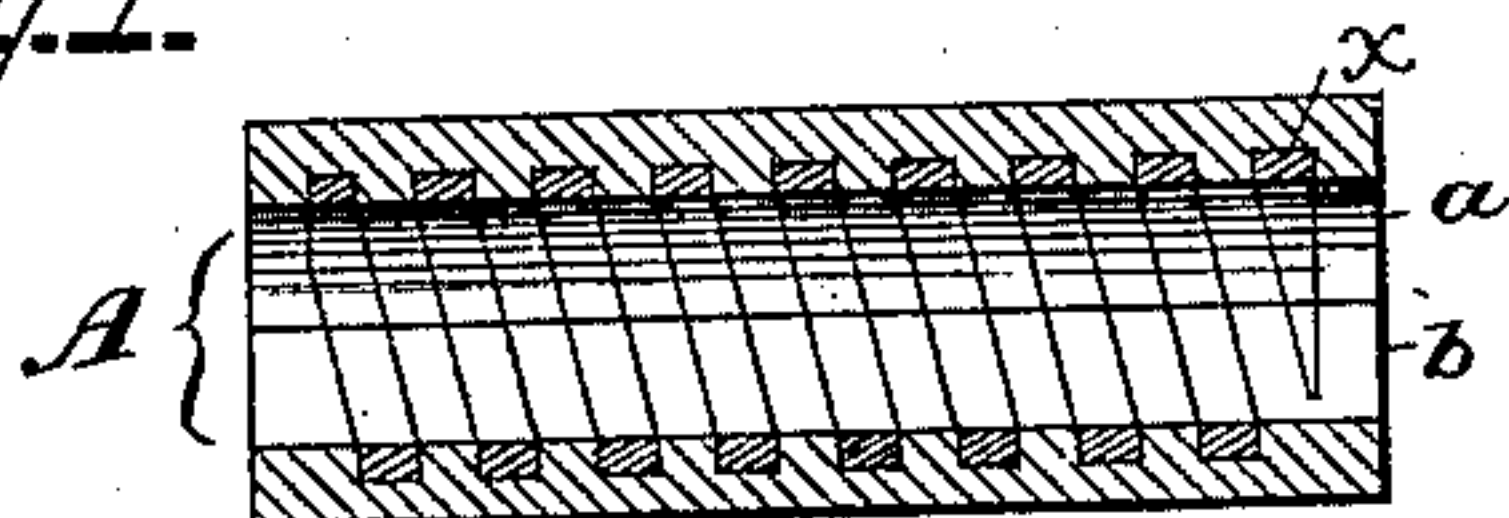


Fig. 4.

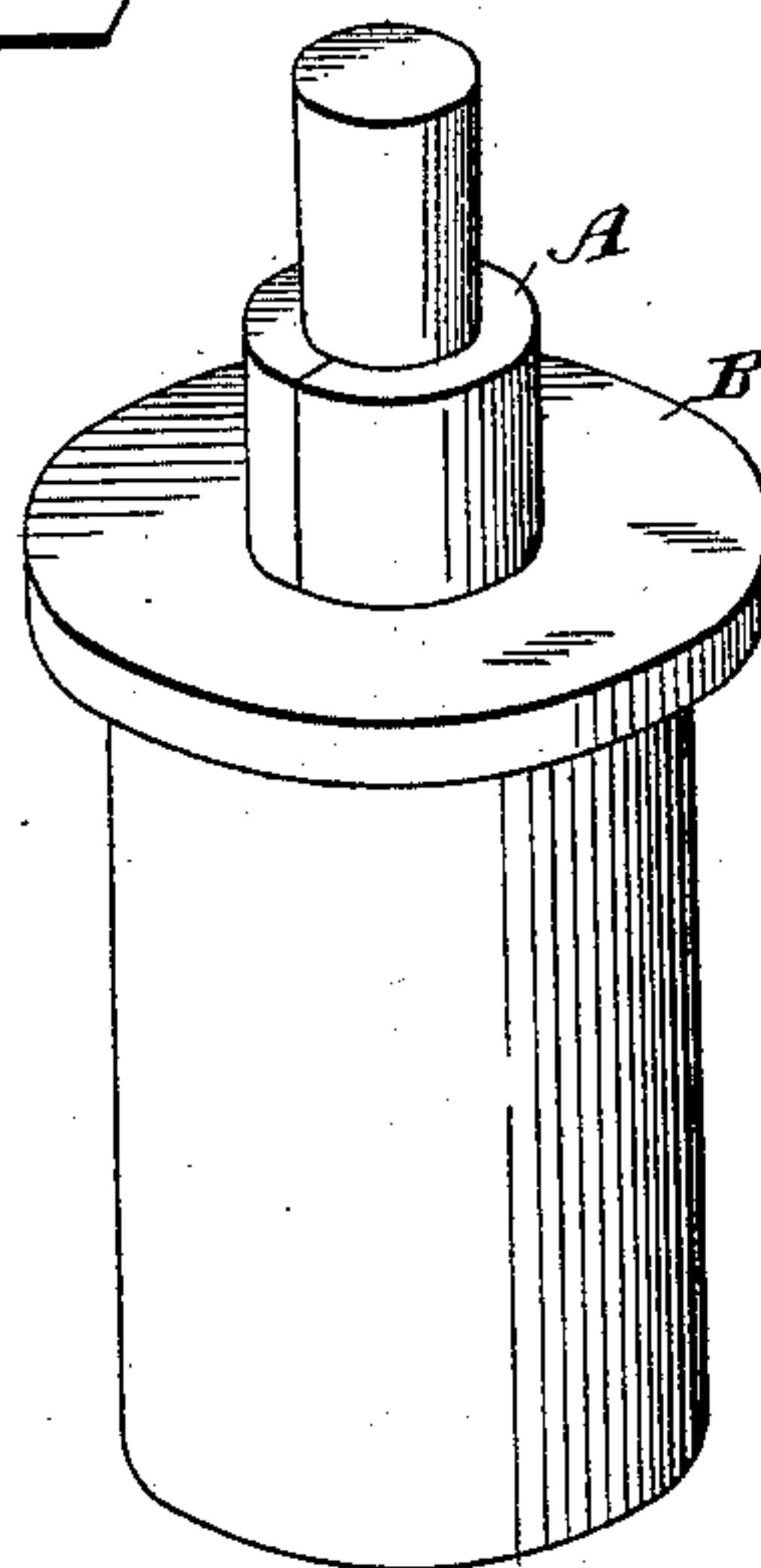


Fig. 2.

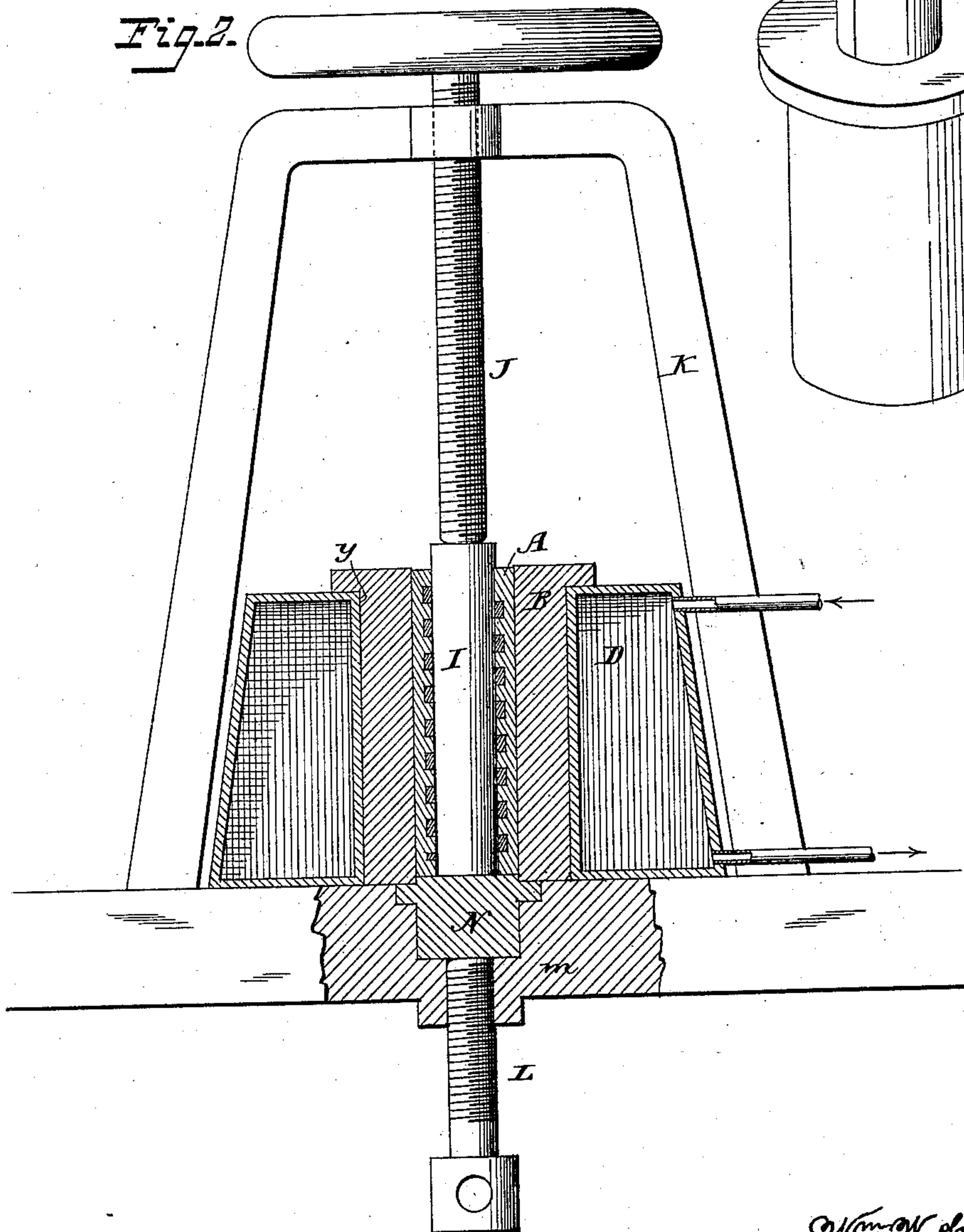


Fig. 3.

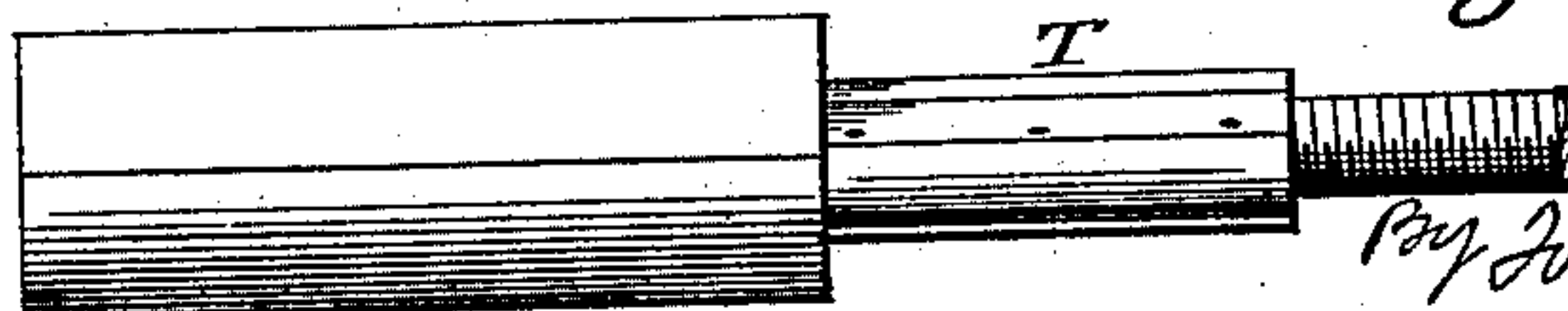
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UNITED STATES PATENT OFFICE.

WILLIAM W. SMALLEY, OF BOUNDBROOK, NEW JERSEY, (ADMINISTRATOR OF JOHN SMALLEY, DECEASED,) ASSIGNOR TO THE GRAPHITE LUBRICATING COMPANY, OF JERSEY CITY, NEW JERSEY. .

MANUFACTURE OF ANTI-FRICTION BEARINGS.

SPECIFICATION forming part of Letters Patent No. 300,025, dated June 10, 1884.

Application filed March 7, 1884. (No model.)

To all whom it may concern:

Be it known that JOHN SMALLEY, deceased, late a citizen of the United States, and a resident of Boundbrook, in the county of Somerset and State of New Jersey, did invent certain new and useful Improvements in the Manufacture of Anti-Friction Bearings, of which the following is a specification.

This invention relates to the manufacture of that class of journal-bearings adapted for loose pulleys, car and vehicle axles, slides, and machinery in general, &c., in which an anti-friction composition is inserted in grooves, recesses, or pockets in a metallic bearing, bushing, or sleeve; and the invention consists in a certain process and apparatus whereby to facilitate the introduction of the anti-friction compound into the pockets, grooves, or recesses.

In the drawings, Figure 1 is a sectional view showing a bearing-box with an anti-friction composition. Fig. 2 is a sectional elevation of a machine for packing the composition in the box. Fig. 3 is a view illustrating the mode of boring out the box. Fig. 4 is a perspective view showing the relative position of the box, holder, and mandrel or plunger.

In Fig. 1 the bearing A is shown as consisting of two semi-tubular sections, *a b*, forming together a tube adapted to receive the shaft or journal, and grooved to receive the anti-friction composition *x*. It will, however, be understood that the bearing or bushing may be of any of the various different forms in which it is common to make them, according to the purpose for which they are employed, and that the recesses, pockets, or receptacles may be of any suitable shape. The compositions which are best adapted for such purposes generally contain graphite, gums, or resins, which may or may not be softened by liquids or other means before their introduction in the receptacles. It has been found difficult in ordinary modes of manufacture to secure uniform results and the complete packing of the receptacles, owing to the liability of the material to become hard and stiff during the process of packing and before the packing is thoroughly completed. To avoid these difficulties,

if the composition is not of the proper consistency, if necessary, the composition is softened in any practicable and desirable way to the proper consistency. Then, first having heated the bearing or bushing in any ordinary heating oven or chamber, the composition is introduced and packed into the receptacle of the bearing or bushing so previously heated, and forced into the bearing or bushing by powerful pressure, maintaining, however, the bearing or bushing at a uniform temperature while the composition is being pressed into the same—in fact, keeping the bearing or bushing at or about the same temperature during the pressing operation as the bearing or bushing was previously subjected to, thereby maintaining sufficient softness in the composition while the pressing is being done to insure the complete filling of the receptacles, and preventing the hardening of the composition by contact with cold metal. As the metal bearing is already heated, in this manner the composition and the bearing or bushing will be strongly cemented together. Different appliances are employed in carrying out this mode of packing the receptacles, depending somewhat on the shape and character of the bearing; but the general features of all are similar, and will be understood from a description of the device illustrated in the drawings, which is adapted for filling bearings for journals, such as is shown in Fig. 1. A tubular holder, B, is made either of one piece or of two or more sections secured together, and adapted to receive the bearing A and hold the parts thereof securely in their relative position. The holder, with the bearing or bushing within the same, is introduced into the chamber *y* of a hollow casing, D, through which is maintained a current of steam or hot air or gas, whereby such a temperature is maintained as will prevent the chilling of the bearing or bushing, which has been previously heated, as before described, the heat also maintaining the composition at a proper consistency. The composition is introduced into the end of the bearing by the use of a scoop or spoon and around a slightly-tapering plunger or mandrel, I, which is also heated while in use. This mandrel or plunger

is slightly smaller in diameter than the opening of the bearing, and it is moved and worked by hand as the composition is introduced between it and the bearing until the receptacles
5 or pockets are filled. A screw, J, or lever or other power worked by hand or foot pressure, supported in an overhanging yoke, K, is then applied to move the plunger downward, and thereby force the composition with a heavy
10 pressure into the channels, grooves, or pockets while the bearing and composition are heated, as stated. After the material has been as firmly packed as is necessary, the presser device is raised and a second screw, L, turn-
15 ing in a cross-piece, *m*, is turned to lift a plunger or block, N, which is brought to bear on the lower ends of the plunger and bearing to force them out of the holder. The plunger and bearing are then removed from holder, the
20 plunger withdrawn from the bearing, and the latter subjected to a baking process to dry or harden the composition, and a reamer, T, is then passed through the bearing, removing the surplus composition, and bringing the face
25 of the same to a level with that of the metal.

Without confining the invention to the precise apparatus described, what is claimed is—

30 1. The improvement in the manufacture of anti-friction bearings consisting in filling the receptacles in the bearing-blocks with anti-friction composition and packing the same therein under heat and pressure, substantially as described.

2. The mode described of making anti-friction bearings, the same consisting in heating 35 the recessed or channeled bearing or bushing and introducing into the channels thereof an anti-friction composition, and in packing the same in the channels under pressure while thus heated, substantially as described. 40

3. The combination, in a machine for packing anti-friction bearings, of a heated receptacle for the channeled or grooved bearings or bushings, and pressure appliances, whereby the composition is forced under pressure into 45 the channels or grooves, substantially as described.

4. The combination of the steam-heated casing D, plungers I and N, and screw J, arranged opposite a chamber in the casing, sub- 50 stantially as described.

5. The combination of the steam-heated casing, screw J, and counter-screw L, substantially as and for the purpose set forth.

6. The combination of the heater contain- 55 ing a chamber, *y*, compressing devices, and holder B, adapted to said chamber and to receive the bearing, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two sub- 60 scribing witnesses.

WILLIAM W. SMALLEY,

Administrator of John Smalley, deceased.

Witnesses:

A. W. VAN WINKLE, Jr.,
SPENCER WEART.