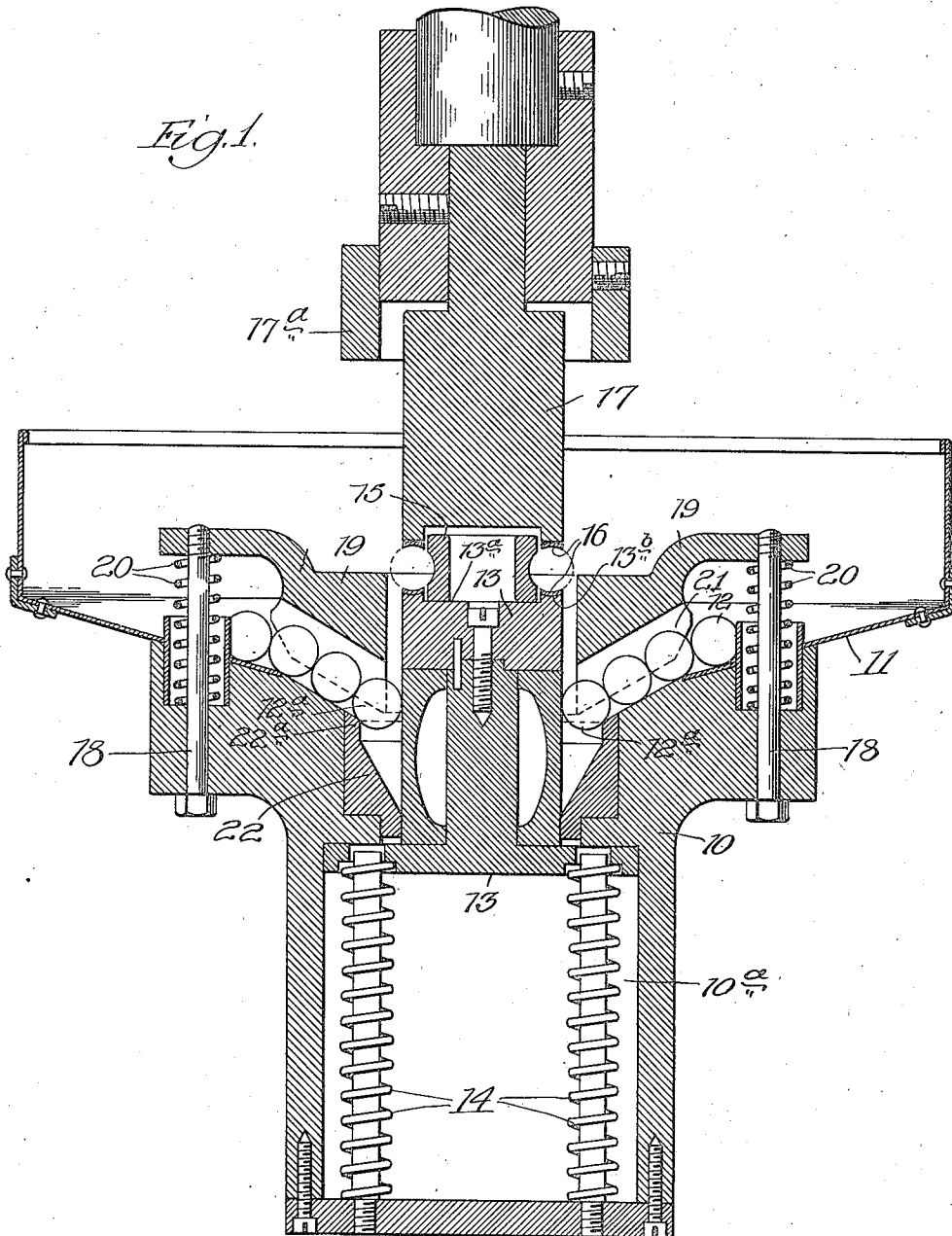


J. DLESK.
MACHINE FOR FILLING BALL RETAINERS.
APPLICATION FILED MAY 10, 1920.

1,401,680.

Patented Dec. 27, 1921.

2 SHEETS—SHEET 1.



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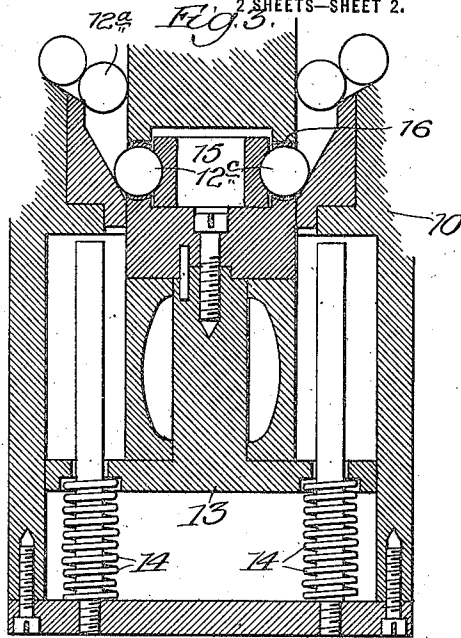
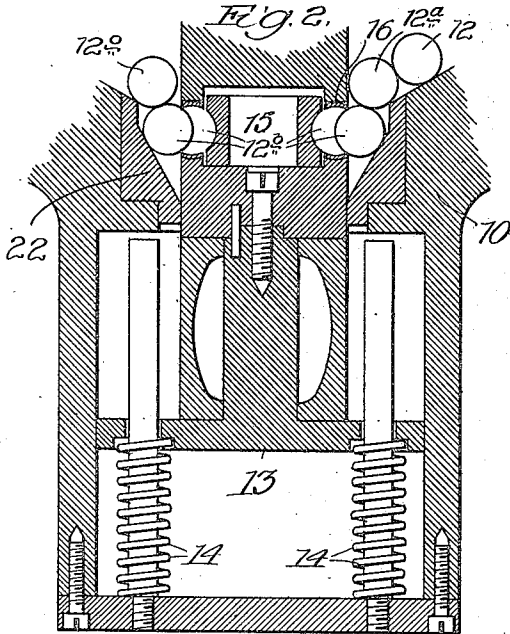


Fig. 4.

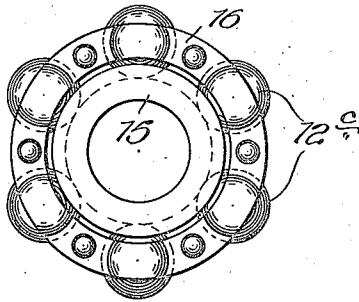
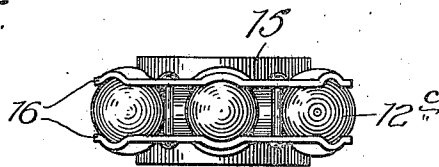


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN DLESK, OF BERWYN, ILLINOIS, ASSIGNOR TO U. S. BALL BEARING MFG. CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

MACHINE FOR FILLING BALL-RETAINERS.

1,401,680.

Specification of Letters Patent. Patented Dec. 27, 1921.

Application filed May 10, 1920. Serial No. 380,296.

To all whom it may concern:

Be it known that I, JOHN DLESK, a citizen of the United States, residing at Berwyn, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Machines for Filling Ball-Retainers, of which the following is a specification.

This invention relates to mechanism for filling ball retainers.

The object of this invention is to provide mechanism for filling ball-retainers which will be automatic in its operation. The invention is fully described in the following specification and shown in the drawings in which Figure 1 is a vertical section through the filling machine showing a ball-retainer which has been filled and is about to be removed therefrom. Fig. 2 is an enlarged partial vertical section showing the balls just entering the retainer. Fig. 3 is a view similar to Fig. 2 showing the balls completely forced into place in the retainer. Fig. 4 is a front elevation of an inner ball-race, a ball-retainer and balls in place therein; and Fig. 5 is a side elevation of the same.

I have illustrated as an embodiment of my invention a machine consisting of the frame 10, which carries a receptacle 11 in which is placed a quantity of steel balls 12. A plunger 13 is slidable vertically in said frame but is narrowly retained in the position shown in Fig. 1 by means of the springs 14, which are inclosed in the opening 10^a of the main frame. The upper end of the plunger 13 is counter-bored at 13^a to accommodate a particular size of inner ball-race 15 and has an annular ledge 13^b which is adapted to receive the ball-retainer 16.

A reciprocating member 17 is moved up and down by any suitable source of power (not shown). In its uppermost position it is raised sufficiently above the position shown in Fig. 1 to allow the empty retainer 16 and inner raceway 15 to be inserted. As this reciprocating member descends it bears upon the raceway 16, forcing it together with the plunger 13 downwardly thereby compressing the springs 14 as shown in Fig. 2.

The frame 10 has vertical openings through which pass vertical guide-rods 18 which are secured at their upper ends to the agitator 19. These rods are surrounded by springs 20 which normally hold the agitator in its uppermost position. Radial guideways 21

are provided in the agitator, the number of these guideways corresponding to the number of balls to be inserted in the particular ball-retainer which it is intended to fill.

It will thus be seen that the balls are fed down these guideways or channels and that there will always be a ball at the lower end of each channel ready to be inserted into the ball-retainer as the ball-retainer moves down with the plunger.

The front ball 12^a in the guideway is retained in the position shown in Fig. 1 until the retainer moves down in front of it as shown in Fig. 2. The ledge 13^b is milled to fit the retainer. If the retainer is not quite in position to register with the guideways 21, weight of the balls will automatically turn it to the proper position for a ball to enter each opening therein, as shown in Fig. 2. The shoulder 22^a of the hollow funnel-shaped guide die 22 normally retains the ball in the position 12^a until the ball-retainer passes in front of it, thereby permitting it to drop into the position 12^b, as shown in Fig. 2.

As the ball-retainer is forced farther down, the funnel-shaped sides of the guide 22 force the balls inwardly into the retainer as shown at 12^c in Fig. 3. At the same time a shoulder 17^a on the reciprocating member 17 engages the agitator 19, forcing it downwardly against the action of the springs 20 and thereby agitates the balls in the hopper 11. This agitation insures a continuous feeding of balls down the channels 21.

The reciprocating member 17 now moves upwardly and the agitator 19 and plunger 13 are returned to the position shown in Fig. 1 by the springs 20 and 14, respectively. The reciprocating member 17 now rises far enough to permit the filled retainer, together with the inner raceway, as shown in Figs. 4 and 5, to be removed as a unit and a new inner raceway and empty retainer to be inserted as before.

While I have shown and described but a single embodiment of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made which do not depart from the spirit of my invention, as disclosed in the appended claims in which it is my intention to claim all novelty inherent in the invention, as broadly as possible, in view of the prior art.

What I claim as new and desire to secure by Letters Patent is:

1. In a machine of the class described, a frame, a hopper associated therewith, a guide
5 having a central funnel-shaped opening, guideways radiating therefrom and communicating with said hopper, a member reciprocating in said guide, said member adapted to receive a ball retainer and a plunger
10 for forcing said member down whereby the retainer will be brought in front of said guideways and forced into said guide.

2. In a machine of the class described, a frame, a hopper associated therewith, a guide
15 having a central funnel-shaped opening, guideways radiating therefrom and communicating with said hopper, a member reciprocating in said guide, said member adapted to receive a ball retainer and a plunger for
20 forcing said member down whereby the retainer will be brought in front of said guideways and forced into said guide, and means for agitating balls in said hopper.

3. In a machine of the class described, a
25 frame, a hopper associated therewith, a guide having a central funnel-shaped opening, guideways radiating therefrom and communicating with said hopper, a member reciprocating in said guide, said member adapted
30 to receive a ball retainer and a plunger for forcing said member down whereby the retainer will be brought in front of said guideways and forced into said guide, and means for agitating balls in said hopper, said means
35 being operable by said plunger.

4. In a machine of the class described, a frame, a hopper associated therewith, a guide
40 having a central opening, guideways radiating therefrom and communicating with said hopper, a member reciprocating in said guide, said member adapted to receive a ball retainer, and a plunger for forcing said member down whereby the retainer will be
45 brought in front of said guideways and forced into said guide, and means for agitating balls in said hopper, said means being operated by a shoulder on said plunger near the bottom of its stroke.

5. In a machine of the class described, a

frame, a hopper associated therewith, a guide
50 having a central funnel-shaped opening, guideway radiating therefrom and communicating with said hopper, a member reciprocating in said guide, said member adapted to receive a ball retainer, spring means for
55 holding said member in a raised position, and a plunger for forcing said member down whereby the retainer will be brought in front of said guideways and forced into said guide.

6. In a machine of the class described, a frame, a hopper associated therewith, a guide having a central funnel-shaped opening, a member movable axially therethrough and adapted to carry a ball retainer and an
65 inner raceway, and means for reciprocating said member with respect to said guide.

7. In a machine of the class described, a frame, a hopper associated therewith, a guide
70 having a central funnel-shaped opening, a member movable axially therethrough and adapted to carry a ball retainer and an inner raceway, means for reciprocating said member with respect to said guide, and means to
75 permit said ball retainer to rotate with respect to the balls to cause the openings therein to register with said balls.

8. In a machine of the class described, a frame, a hopper associated therewith, a guide
80 having a central funnel-shaped opening, guideways radiating therefrom and communicating with said hopper, a member reciprocating in said guide, said member adapted to receive a ball retainer, and a plunger for forcing said member down whereby the
85 retainer will be brought in front of said guideways, and forced into said guide and means to permit said ball retainer to rotate with respect to the balls to cause the openings therein to register with said balls.

9. In a machine for filling ball retainers, means for holding a ball retainer having radial openings for the balls, means for feeding balls to said openings and means
90 operable by movement of said retainer for forcing a ball into each of said openings simultaneously.

JOHN DLESK.