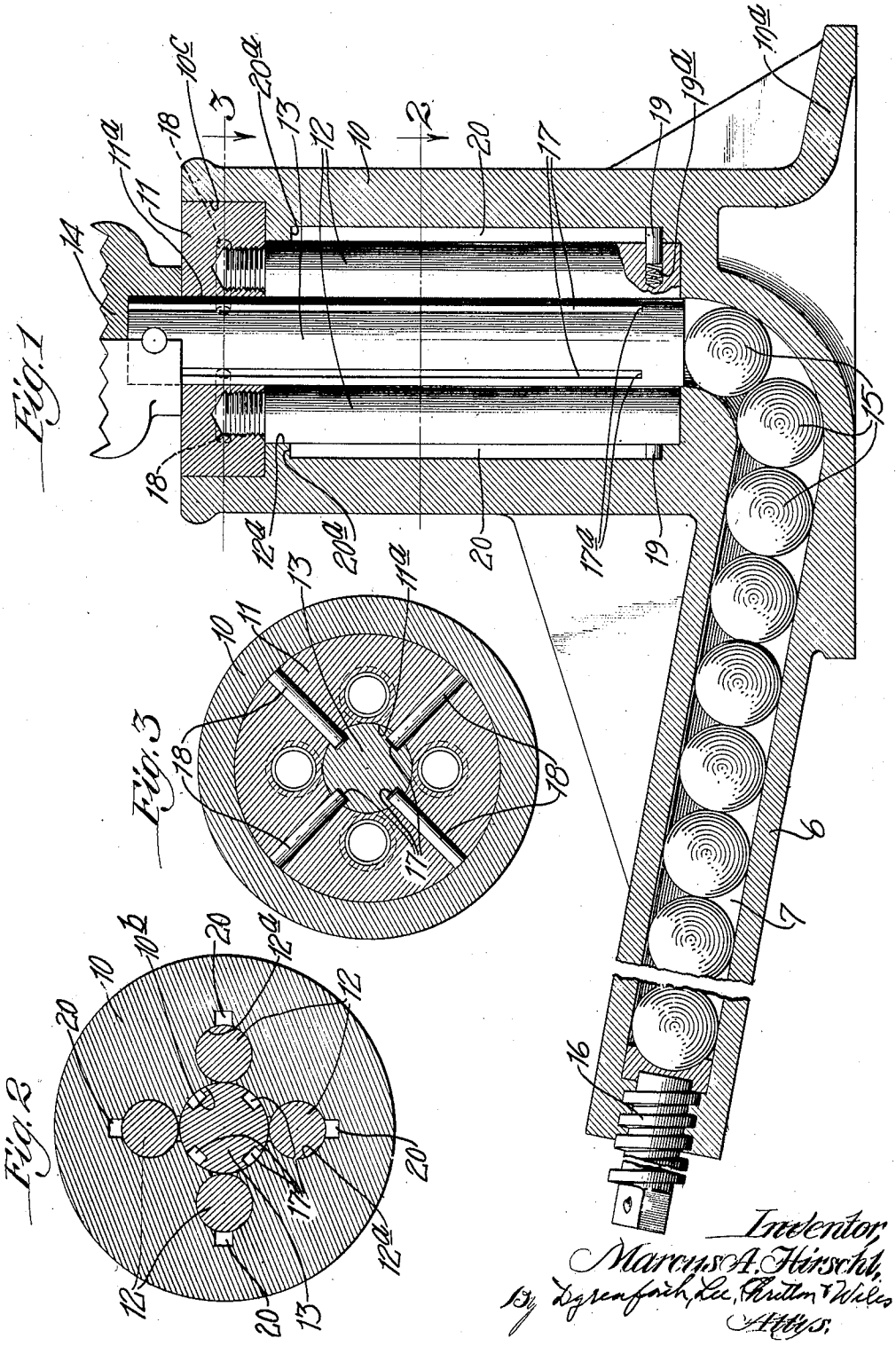
Nov. 20, 1928. 1,692,444

M. A. HIRSCHL

JACK

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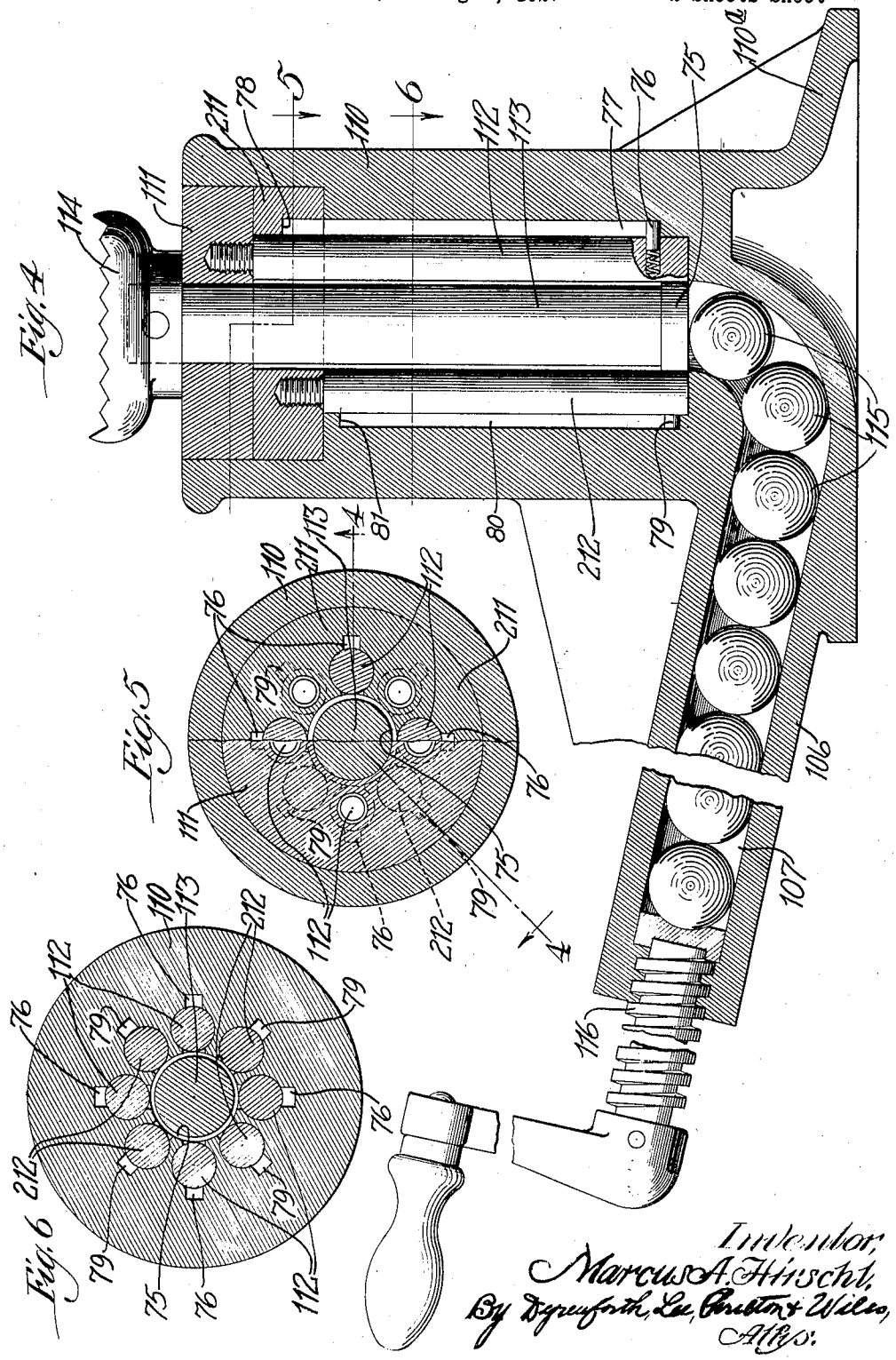


Nov. 20, 1928. 1,692,444

M. A. HIRSCHL

JACK

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Patented Nov. 20, 1928. 1,692,444

UNITED STATES PATENT OFFICE.

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JACK.

Application filed August 5, 1927. Serial No. 210,859.

This invention relates to improvements in jacks, and more especially to a lifting jack such as is commonly used in connection with the repairing of tires on automobiles. My improved jack is of the type having a standard and a lifting member telescoped therein.

My improved jack is compact when collapsed, has a considerable lift when fully extended and is easy to operate, strong and durable.

In that form of device embodying the features of my invention shown in the accompanying drawings, Figure 1 is a vertical sectional view, Fig. 2 is a view taken as indicated by the line 2 of Fig. 1, Fig. 3 is a view taken as indicated by the line 3 of Fig. 1, Fig. 4 is a vertical sectional view, taken as indicated by the line 4—4, of Fig. 5, showing a modified form, Fig. 5 is a view taken as indicated by the line 5 of Fig. 4, and Fig. 6 is a view taken as indicated by the line 6 of Fig. 4.

One of the particular features of my invention is the provision of a jack with a hollow standard and having an inner lifting member, and one or more additional ball retaining members. The bore in the standard and in the ball retaining members is constant in size at all times, whether the lifting member be elevated or not. Accordingly, there may be utilized for operating the jack a row of balls of uniform size lying in the bore. Means are also provided for forcing said balls longitudinally in said bore to elevate the telescoping lifting member of the jack. This telescoping lifting member may be elevated completely out of the standard and when so elevated, one or more ball retaining members serve to hold the row of balls below it in straight alignment.

As shown in the drawings, 10 indicates a cylindrical hollow standard mounted on the base 10^a.

The base is provided with an arm-like extension 6 having a way therein comprising a central cylindrical bore-like portion 7. This way is curved at its inner end and opens upwardly into the lower end of the standard.

In the form shown in Figs. 1, 2 and 3, I have provided a lifting member and one ball retaining member. The lifting member consists of the solid bar 13 carrying on its upper end the shoe or support 14 to engage the axle of a car.

The ball retaining member comprises the collar 11 with the four downwardly projecting bars 12, the inner surfaces of which lie adjacent the outer surface of the bar 13. The bars 12 are adapted for vertical sliding movement in the holes 12^a in the standard 10, such holes being arranged just outside of the central bore or hole 10^b in the standard, so that the inner faces or surfaces of the bars 12 will be substantially in contact with the outer face or surface of the lifting member 13 when the jack is collapsed (see Fig. 2). The upper end of the standard 10 is provided with an annular enlargement 10^c adapted to accommodate the collar 11 when the same is in its lowermost position. In speaking of the ball retaining member, I include the collar 11 with the projecting bars 12 having their upper ends threaded thereinto. It is obvious that this ball retaining member may be made of one piece if desired. The collar 11 is provided with a centrally arranged hole 11^a adapted to receive the bar 13 of the inner lifting member.

The lifting member is adapted to be elevated by a row of balls 15 lying in the bore 7 and adapted to be forced inwardly by a screw 16.

18 indicates pins projecting through the collar 11 having their inner ends lying in slots 17 in the lifting member, the lower ends of said slots terminating in shoulders 17^a.

19 indicates pins in the lower ends of the bar 12 pressed outwardly by means of the springs 19^a, the outer ends of said pins lying in the grooves 20 in the standard 10.

In the operation of the device, the screw 16 is turned inwardly to move the row of balls to press the lifting member 13 upwardly. When the ends of the pins 18 are engaged by the shoulders 17^a the ball retaining member 11, 12 will be moved upwardly until the pins 19 engage the shoulders 20^a at the upper ends of the grooves 20. The balls 15 will always be held in straight alignment above the standard 10. When the jack is fully extended, with the lifting member entirely out of the standard 10, the balls will be held in alignment above the standard in the ball retaining member by the bars 12, 12, and also in the standard where they will lie in the bore 10^b of such standard. The walls of said standard surrounding the bore between the holes 12^a will serve to keep the balls in alignment even though the bars 12 are elevated.

The assembly of the jack is very simple as

the member 13 can be inserted through the collar 11 from the bottom and the shoe 14 then attached. The bars 12 can then be dropped in the standard from above by merely pressing in the pins 19 until they clear the shoulders 20ª.

The construction and operation of the modified form shown in Figs. 4, 5 and 6 are very much like the preferred form and consequently need not be described in particular. It will suffice to say that in this form I provide two ball retaining members instead of one. One of these is indicated by the collar 111 with the four depending bars 112 and the other by the collar 211 with four additional depending bars 212 alternating with the bars 112. In this modified form the lifting member is indicated by 113 and the shoe by 114.

In the modified form shown in Figs. 4, 5 and 6, the collar 111 lies above the collar 211, the latter being provided with holes to accommodate the bars 112.

In the modified form the stops may be arranged in any suitable manner. For example, the lower end of the lifting member 113 may be provided with an enlargement 75 adapted to engage the collar 111; and the lower ends of the bars 112 may be provided with pins 76 outwardly pressed by springs operating in grooves 77 in the standard 10, such grooves being continued part way into the collar 211 and terminating in shoulders 78. Likewise, the lower ends of the bars 212 may be provided with similar pins 79 operating in grooves 80 in the standard 110, terminating at their upper ends in shoulders 81.

While I have shown and described certain embodiments 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 without departing from the spirit and scope of the invention disclosed in the appended claims, in which it is my intention to claim all novelty in my invention as broadly as possible in view of the prior art.

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

1. A jack comprising, a standard having a bore; a lifting member telescoping in said bore; a ball retaining member telescoping into said standard and having ball retaining bars surrounding said bore; a collar on the ball retaining member surrounding the lifting member; a ball receiving extension having a bore communicating with the lower end of the bore in the standard; a row of balls lying in said ball receiving extension; means for forcing said balls from said extension into the bore in the standard and against the lower end of the lifting member; and means for limiting the upward movement of the lifting member through the collar on the ball retaining member.

2. A jack comprising; a standard having a bore; a lifting member telescoping in said bore; a plurality of ball retaining members telescoping into said standard, each having ball retaining bars surrounding said bore; a collar on each ball retaining member surrounding the lifting member, the ball retaining bars of one of said ball retaining members extending through the collar of the other ball retaining member; a ball receiving extension having a bore communicating with the lower end of the bore in the standard; a row of balls lying in said ball extension; means for forcing said balls from said extension into the bore in the standard and against the lower end of the lifting member; means for limiting the upper movement of the lifting member through the collar in one of the ball retaining members; and means for limiting the upward movement of the ball retaining bars of one of said ball retaining members through the collar in the other ball retaining member.

3. A jack comprising; a standard having a bore; a lifting member telescoping in said bore; a ball retaining member telescoping into said standard and having ball retaining bars surrounding said bore; a collar on the ball retaining member surrounding the lifting member; a ball receiving extension having a bore communicating with the lower end of the bore in the standard; a row of balls lying in said ball receiving extension; means for forcing said balls from said extension into the bore in the standard and against the lower end of the lifting member; and means for limiting upward movement of the ball retaining member in the standard.

4. A jack comprising; a standard having a bore; a lifting member telescoping in said bore; a ball retaining member telescoping into said standard and having ball retaining bars surrounding said bore; a collar on the ball retaining member surrounding the lifting member; a ball receiving extension having a bore communicating with the lower end of the bore in the standard; a row of balls lying in said ball receiving extension; means for forcing said balls from said extension into the bore in the standard and against the lower end of the lifting member; and means for limiting the upward movement of the lifting member through the collar on the ball retaining member, said means including inwardly projecting pins in the collar, the ends of said pins projecting into slots in the lifting member, said slots terminating in shoulders at their lower ends.

5. A jack comprising; a standard having a bore; a lifting member telescoping in said bore, a ball retaining member telescoping into said standard and having ball retaining bars surrounding said bore; a collar on the ball retaining member surrounding the lifting member; a ball receiving extension having a bore communicating with the lower end of the bore in the standard; a row of balls lying in said

ball receiving extension; means for forcing said balls from said extension into the bore in the standard and against the lower end of the lifting member; and means for limiting upward movement of the ball retaining member in the standard, said means including outwardly extending pins carried by the lower ends of the ball retaining bars, the ends of said pins projecting into grooves in the inner wall of the bore of the standard, said grooves terminating in shoulders at their upper ends.

6. A jack comprising; a standard having a bore, a lifting member telescoping in said bore, a ball retaining member telescoping into said standard and having ball retaining bars surrounding said bore; a collar on the ball retaining member surrounding the lifting member; a ball receiving extension having a bore communicating with the lower end of the bore in the standard; a row of balls lying in said ball receiving extension; means for forcing said balls from said extension into the bore in the standard and against the lower end of the lifting member; and means for limiting upward movement of the ball retaning member in the standard, said means including outwardly extending spring pressed pins carried by the lower ends of the ball retaining bars, the ends of said pins projecting into grooves in the inner wall of the bore of the standard, said grooves terminating in shoulders at their upper ends.

7. A jack comprising; a standard having a bore; a ball receiving extension having a bore communicating with the lower end of the bore in the standard; a row of balls lying in said ball receiving extension; means for forcing said balls from said extension into the bore in the standard; a lifting member telescoping in the bore in the standard; and a ball retaining member telescoping into said standard and adapted to hold said balls in alignment therein when extended.

8. A jack comprising; a standard having a bore; a ball receiving extension having a bore communicating with the lower end of the bore in the standard; a row of balls lying in said ball receiving extension; means for forcing said balls from said extension into the bore in the standard, a lifting member telescoping in the bore in the standard; and a ball retaining member carrying the inner lifting member and telescoping in the standard, said ball retaining member adapted to hold said balls in alignment when the lifting member and ball retaining member are extended.

9. A jack comprising; a standard having a bore; a ball receiving extension having a bore communicating with the lower end of the bore in the standard; a row of balls lying in said ball receiving extension; means for forcing said balls from said extension into the bore in the standard; a lifting member telescoping in the bore in the standard; a ball retaining member carrying the inner lifting member, said ball retaining member having ball retaining bars telescoping into the standard and surrounding the bore therein, said ball retaining bars adapted to hold the balls in alignment when the ball retaining member and lifting member are extended.

10. A jack comprising; a standard having a bore; a ball receiving extension having a bore communicating with the lower end of the bore in the standard; a row of balls lying in said ball receiving extension; means for forcing said balls from said extension into the bore in the standard; a lifting member telescoping in the bore in the standard; and ball retaining means carrying the lifting member and permitting the same to be elevated completely out of the standard by upward pressure of the row of balls, said means operating to hold said balls in alignment above the end of the bore in the standard.

11. A jack comprising; a standard having a bore; a ball receiving extension having a bore communicating with the lower end of the bore in the standard; a row of balls lying in said ball receiving extension; means for forcing said balls from said extension into the bore in the standard; a lifting member telescoping in the bore in the standard; and ball retaining means carrying the lifting member and permitting the same to be elevated completely out of the standard by upward pressure of the row of balls, said means operating to hold said balls in alignment above the end of the bore in the standard; and means for limiting the upward movement of the lifting member and the ball retaining means.

12. A jack comprising; a standard having a bore; a ball receiving extension having a bore communicating with the lower end of the bore in the standard; a row of balls lying in said ball receiving extension; means for forcing said balls from said extension into the bore in the standard; a lifting member telescoping in the bore in the standard; and ball retaining means carrying the lifting member and permitting the same to be elevated completely out of the standard by upward pressure of the row of balls, said means operating to hold said balls in alignment above the end of the bore in the standard; and means for limiting the upward movement of the lifting member.

13. A jack comprising; a standard having a bore; a ball receiving extension having a bore communicating with the lower end of the bore in the standard; a row of balls lying in said ball receiving extension; means for forcing said balls from said extension into the bore in the standard; a lifting member telescoping in the bore in the standard; a ball retaining member carrying the inner lifting member, said ball retaining member having ball retaining bars telescoping into the standard and surrounding the bore therein; said ball

retaining bars adapted to hold the balls in alignment when the ball retaining member is extended.

14. A jack comprising; a standard having a bore; a ball receiving extension having a bore communicating with the lower end of the bore in the standard; a row of balls in said ball receiving extension; means for forcing said row of balls from said extension into the bore in the standard; a lifting member telescoping in the bore in the standard and adapted to be elevated by said row of balls; and ball retaining means permitting the lifting member to be elevated completely out of the standard, said ball retaining means operating to hold the row of balls in straight alignment above the standard when the lifting member is so elevated.

15. A jack comprising; a standard having a bore; a ball receiving extension having a bore communicating with the lower end of the bore in the standard; a row of balls in said ball receiving extension, means for forcing said row of balls from said extension into the bore in the standard; a lifting member telescoping in the bore in the standard and adapted to be elevated by said row of balls; ball retaining means permitting the lifting member to be elevated completely out of the standard, said ball retaining means operating to hold the row of balls in straight alignment above the standard when the lifting member is so elevated; and means for limiting the elevation of the lifting member.

16. A jack comprising; a standard having a bore; a ball receiving extension having a bore communicating with the lower end of the bore in the standard; a row of balls in said ball receiving extension, means for forcing said row of balls from said extension into the bore in the standard; a lifting member telescoping in the bore in the standard and adapted to be elevated by said row of balls; and ball retaining means permitting the lifting member to be elevated completely out of the standard, said ball retaining means operating to hold the row of balls in straight alignment above the standard when the lifting member is so elevated, said ball retaining means including a collar surrounding the lifting member with depending bars telescoping into the standard.

17. A jack comprising; a standard having a bore; a ball receiving extension having a bore communicating with the lower end of the bore in the standard; a row of balls in said ball receiving extension, means for forcing said row of balls from said extension into the bore in the standard; a lifting member telescoping in the bore in the standard and adapted to be elevated by said row of balls; ball retaining means permitting the lifting member to be elevated completely out of the standard, said ball retaining means operating to hold the row of balls in straight alignment above the standard when the lifting member is so elevated, said ball retaining means including a collar surrounding the lifting member with depending bars telescoping into the standard; and means for limiting the elevation of the lifting member.

In witness whereof, I have hereunto set my hand this 1st day of July, 1927.

MARCUS A. HIRSCHL.