June 23, 1925. 1,543,181

H. W. MOORE

ELECTRIC JACK

Filed April 19, 1924

Fig. 1

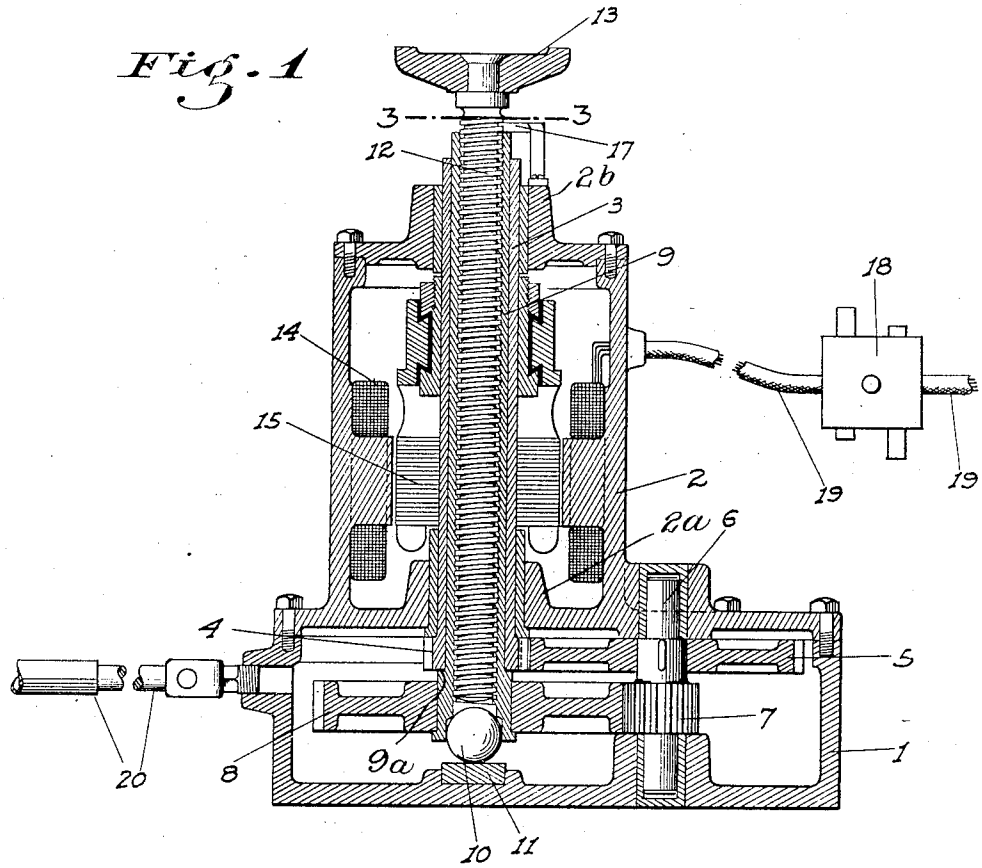


Fig. 2

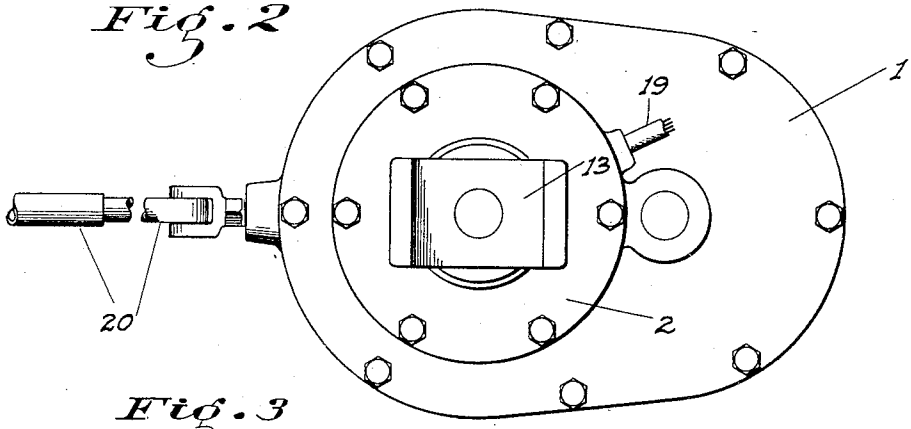
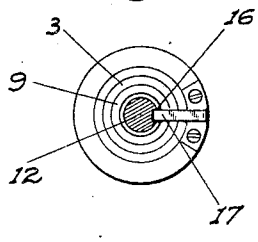


Fig. 3



INVENTOR

Harvey W. Moore

BY Percy J. Webster

ATTORNEY

Patented June 23, 1925. 1,543,181

UNITED STATES PATENT OFFICE.

HARVEY W. MOORE, OF SAN FRANCISCO, CALIFORNIA.

ELECTRIC JACK.

Application filed April 19, 1924. Serial No. 707,613.

To all whom it may concern:

Be it known that I, HARVEY W. MOORE, a citizen of the United States, residing at San Francisco, county of San Francisco, State of California, have invented certain new and useful Improvements in Electric Jacks; and I do declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this application.

This invention relates to improvements in electrically driven jacks, and especially to a type having a low voltage motor which may be driven from the storage battery of an automobile. This jack therefore is particularly designed to be used in connection with the jacking up of automobiles without the need of physical effort in so doing.

The present invention particularly represents an improvement over Patent No. 1,451,048, granted April 10th, 1923, to myself and C. H. Schumacher. The principal object now is to provide an electric jack in which the number of parts is reduced to a minimum, without reducing the efficiency of operation, and a very compact, relatively light, and inexpensive jack is provided.

Another object of the invention is to provide the bearing arrangements of the several turnable parts of the jack so as to reduce side torque to a minimum. Inasmuch as the entire strain on the jack is in a vertical line, any tendency to side torque or binding between the vertically moving parts is a detriment, particularly where the motive power is an electric motor of the type proposed to be used by me. I aim therefore to keep all vertically moving parts in constant fixed vertical bearing contact one with the other so that they can slip through one another with easy motion as the jack functions.

The above and other objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a sectional elevation of my improved jack.

Fig. 2 is a top plan view of the same.

Fig. 3 is a cross section on the line 3—3 of Fig. 1.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 denotes a lower casing member of sufficient surface area to serve as a good substantial base for the jack. A cylindrical portion 2 is mounted on and projects upwardly from the member 1, these two members preferably being made each separate for ease of manufacturing. The spaced vertical ends of the cylinder 2 are provided with central bearing members 2^a and 2^b respectively.

Turnably mounted in the bearings 2^a and 2^b and extending completely through the cylinder 2, and into the casing 1, is a sleeve 3. On the lower end of such sleeve 3 and within the casing 1 is provided a pinion 4 which bears against the lower end of the bearing 2^a to hold the sleeve 3 from longitudinal movement when assembled in the completed jack. The pinion 4 meshes with a gear 5 fixed on a stem 6 journaled in the casing 1. On this stem 6 below the gear 5 is a pinion 7 which meshes with a gear 8 fixed on the lower end of a sleeve 9 which is turnably fitted in the sleeve 3. By means of this construction the speed of the inner sleeve 9 is reduced considerably below that of the outer sleeve 3, the extent of such difference depending of course on the relative sizes of the gears and pinions. The sleeve 9 is supported at its lower end by a single ball bearing 10 which rests on a hardened pad 11 seated in the bottom of the casing 1.

The sleeve 9 extends through the entire length of the sleeve 3, and is provided with a shoulder 9^a bearing against the lower end of such sleeve 3 to hold the sleeve 9 against longitudinal movement when the jack is assembled.

Screwed into the inner sleeve 9 from end to end thereof is the jack or raising stem 12, the upper end of which carries a suitable pad or head 13.

Mounted in the upper casing member 2 is an electric motor, which consists of two main parts, which may be termed the stator 14 and the rotor 15. The latter is suitably connected to the outer sleeve 3 so as to be in direct driving relation therewith, and of course completely surrounds said sleeve.

To prevent the stem 12 from turning, it is

provided with a longitudinal slot 16 in which rides a pin or tooth 17 which is fixed onto the upper end of the casing 2 above the surrounding sleeves.

This motor is a reversible one, and to control the movements thereof, I provide a switch 18 of suitable form which is interposed in the leads 19 to said motor, the outer end of said leads being adapted to be connected to the storage battery terminals of a car.

To insert the jack into place and withdraw the same a suitable form of telescopic handle 20 is attached to the base member 1. This handle for instance may be of the type shown in the above mentioned patent, or any other form which may be found suitable.

In operation with the turning on of the current to the motor in the desired direction of rotation thereof, the turning of the motor will impart, through the gears and pinions, a similar but slower rotative movement to the inner sleeve 9. Such rotation will cause a vertical movement of the stem 12 either up or down, as the case may be.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention, what I claim as new and useful and desire to secure by Letters Patent is:

1. A jack including a casing structure having longitudinally spaced bearings therein, an outer sleeve turnably mounted in the bearings, an inner sleeve turnably mounted in the outer sleeve, reduction gearing between the sleeves, driving means applied to the outer sleeve intermediate the bearings, and a jack stem threaded directly into the inner sleeve, whereby the lifting strain of the stem is taken directly by said sleeve with the rotation thereof.

2. A jack including a casing structure having longitudinally spaced bearings therein, an outer sleeve turnably mounted in and having bearing contact with an inner sleeve for its entire length, whereby the sleeves are prevented from lateral deflection relative to each other, reduction gearing between the sleeves, driving means applied to the outer sleeve intermediate the bearings, and a jack stem screwed directly into the inner sleeve, the latter being tapped for its entire length to receive the stem, whereby the latter can never have lateral deflection in the sleeve.

3. A jack including a casing structure having longitudinally spaced bearings therein, an outer sleeve turnably mounted in the bearings, an inner sleeve turnably mounted in the outer sleeve, a jack stem threaded into the inner sleeve, reduction gearing between the sleeves, driving means applied to the outer sleeve, and means between the casing structure and sleeves for holding the latter longitudinally immovable in the casing.

4. A jack including a casing structure having longitudinally spaced bearings therein, an outer sleeve turnably mounted in the bearings, and projecting therebelow, an outwardly projecting shoulder on the sleeve below the lower bearing, an inner sleeve turnably mounted in the outer sleeve and extending therebelow, a shoulder on the inner sleeve projecting under the lower end of the outer sleeve, means between the inner sleeve and casing structure for causing said shoulders and adjacent parts to be maintained in close engagement, a jack stem screwed into the inner sleeve, reduction gearing between the sleeves, and driving means applied to the outer sleeve.

In testimony whereof I affix my signature.

HARVEY W. MOORE.