May 27, 1930. A. PETELER 1,760,436

LIFTING JACK

Filed Sept. 29, 1926 2 Sheets-Sheet 1

FIG. 1

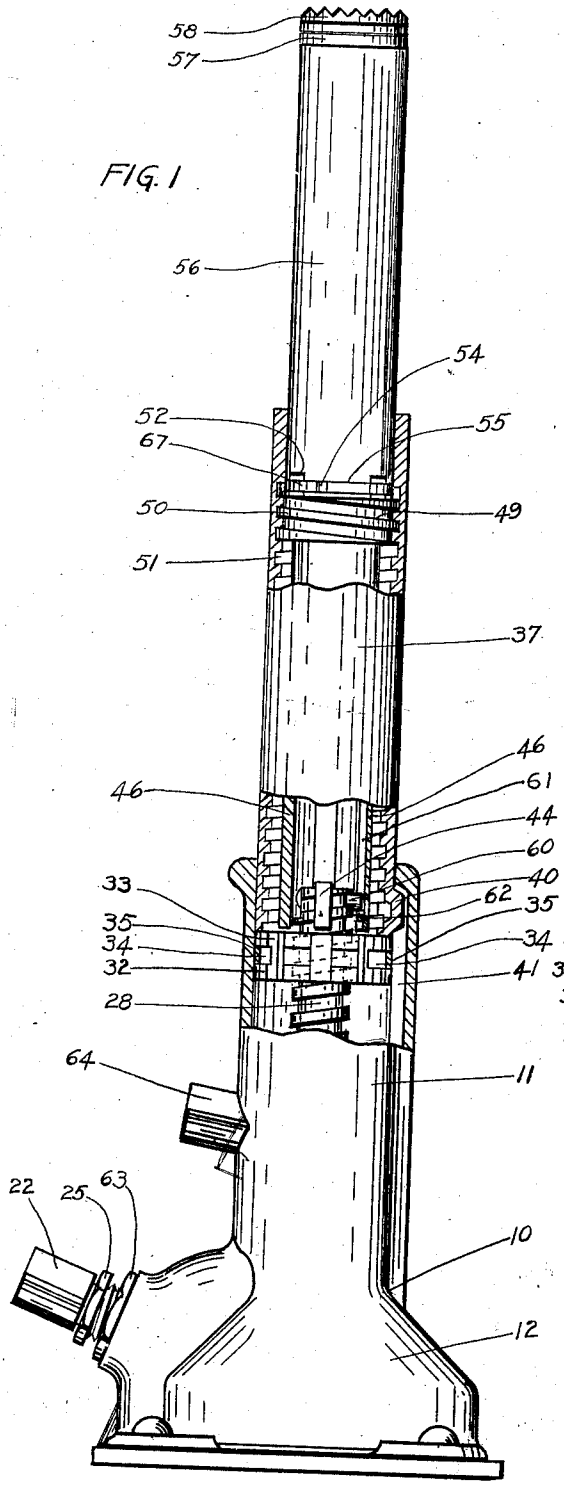
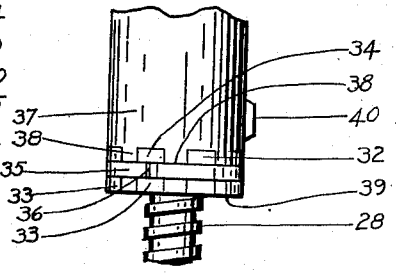


FIG. 6



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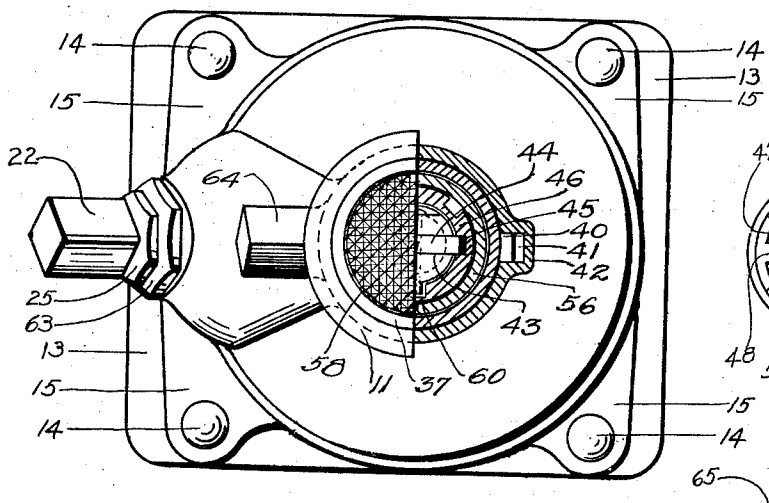


FIG. 3

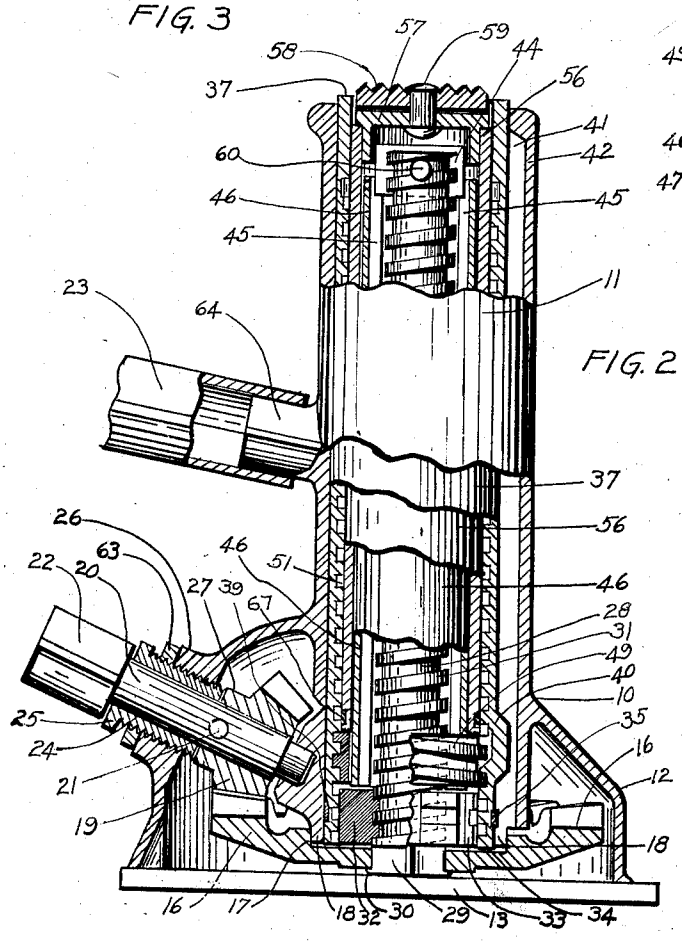


FIG. 2

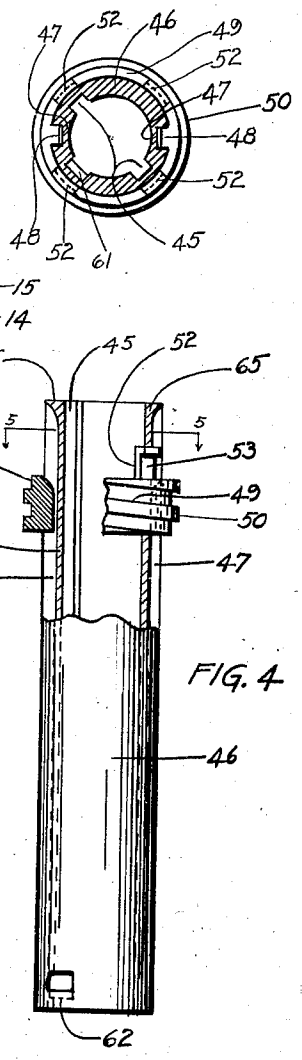


FIG. 4

FIG. 5

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UNITED STATES PATENT OFFICE

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LIFTING JACK

Application filed September 29, 1926. Serial No. 138,580.

My invention relates to jacks and more particularly to a lifting jack that is particularly adapted for lifting of vehicles and similar purposes.

It is a purpose of my invention to provide a lifting jack that is very compact in construction and that has a large amount of lift for the height of the jack. This has been found to be particularly desirable in connection with automobiles and similar vehicles using tires of large diameter which are commonly called balloon tires. This purpose is accomplished by providing a jack with a pair of extensible members, one of said members being extensible relative to the base or body of the jack and the other being extensible simultaneously therewith relative to the first mentioned extensible member.

It is still a further purpose of the invention to provide a jack of the above mentioned character that is easy to operate and is simple in construction. Preferably, the jack is made of parts that have a smooth exposed portion when the jack is in extended position with no projecting screws or similar parts that can be broken off on the extensible members and the operating means therefor.

It is still another purpose of the invention to provide a jack or similar lifting device with a pair of extensible members that are simultaneously extensible, one relative to the base of the jack and the other relative to the first extensible member and to provide means for simultaneously extending said members comprising a driving member and a member that is mounted relative to the driving member so as to rotate therewith, but which is axially movable relative thereto. In the form of the invention shown, the axially slidable member is also slidably mounted relative to a member having screw-threaded engagement with the first extensible member, thus providing what is substantially a floating member forming the driving connection between the driving member and the second extensible member. By providing such a driving connection, there will always be a positive drive between the driving member and the means having screw-threaded engagement with the extensible member, no matter what the position of said first extensible member may be relative to the driving member.

It is also a purpose of the invention to provide means for operating the driving member comprising suitable gearing and a handle detachably associated with the gearing to operate the same and to provide a projection or lug on the jack that is adapted to be engaged by the detachable handle member whereby the detachable handle member will serve as a handle for the jack as a whole, said projection and detachable handle members being relatively so formed that there will be no relative rotation between the same.

Other objects and advantages of the invention will appear as the description of the accompanying drawings proceeds. However, I desire to have it distinctly understood that I do not intend to limit myself to the exact details shown or described, but that I intend to include as part of my invention all such obvious changes and modifications of parts as would occur to a person skilled in this art and as would fall within the scope of the claims.

In the drawings:

Figure 1 is a view partly in elevation and partly in longitudinal section of my improved jack showing the same in extended position, certain parts being broken away;

Figure 2 is a similar view showing the same in contracted position;

Figure 3 is a view partly in plan and partly in transverse section of my improved jack;

Fig. 4 is a view partly in elevation and partly in section of the floating member forming a connection between one of the extensible members and the driving means and the threaded nut associated therewith;

Fig. 5 is a section taken on the line 5—5 of Fig. 4; and

Fig. 6 is a fragmentary elevational view of the lower end of one of the extensible members and of a portion of the driving member.

Referring in detail to the drawings, the jack comprises a base member 10 having a substantially vertically extending casing portion or housing 11 and an enlarged bottom

portion 12. Said base member or casing is provided with a bottom 13 that is secured to the casing or base member by any suitable securing means 14, suitable ears being provided at 15 on the member 10 through which said securing means pass.

Within said base or casing is provided a large bevel gear 16 that is provided with a recess having an annular wall portion 17 engaging with the annular fin 18 on the base member 10 as a bearing, said member 16 being mounted between the bottom 13 and said fin 18. A bevel pinion 19 meshes with the gear 18 and is pinned to the shaft 20 by means of the pin 21, said shaft being provided with a head 22 which is preferably square or which may be of some other shape to receive a correspondingly shaped socket member on a handle 23 so that said shaft 20 may be turned by means of said handle. A flanged bushing or sleeve 24, having the flange 25, screw-threadedly engages with the screw-threaded boss 26 on the base member 10 and engages with the head 22 or the boss or hub 27 on the pinion 19, as the case may be, to move the pinion 19 either inwardly or outwardly in order to adjust the position thereof relative to the gear 16.

A shaft 28 is secured at one end thereof to the gear 16 so as to rotate therewith by providing a squared end 29 thereon that seats in a correspondingly shaped opening in the gear 16. Said squared end is upset as shown at 30 so as to hold the gear in place on the shaft member 28, the end of the shaft 28 engaging with the plate 13 so as to limit the downward movement of the gear 16 and of said shaft 28. The shaft 28 is provided with an external screw-thread 31 and an internally threaded nut 32 is mounted thereon.

The nut 32, as will be clear from Fig. 6, is provided with a plurality of projections 33 that are provided with grooves 34 in which the spring locking ring 35 having a split at 36 is adapted to seat. A tubular member 37 surrounds the major portion of the nut 32 and is provided with projections 38 extending endwise therefrom that interfit with the projections 33, said projections 38 being similarly grooved as at 39 to receive the locking ring 35. The tubular member 37 is provided with an outstruck lug or key 40 that engages in the groove or keyway 41 provided in the casing or base member 10, the vertically extending portion 11 of the casing being provided with a laterally extending hollow rib portion 42 to provide the groove or keyway 41 within the same. It will accordingly be seen that the tubular member 37 is held from rotation by the interengaging rib 40 and groove 41. As the nut 32 is keyed to the member 40, due to the interlocking projections provided on the members 37 and 32, the rotation of the threaded driving member or shaft 28 will cause the nut 32 to travel axially of the driving member or shaft 28 as the member 28 is rotated carrying the member 37 with said nut 32. Thus, by turning the shaft 20 in the proper direction, the tubular member or extensible member 37 will be moved outwardly from the vertically extending portion 11 of the base member or casing 10, said tubular or extensible member being free to slide axially, but being held against rotation by the provision of the lug 40.

The driving member or shaft 28 is further provided with a slot 43 in the upper end thereof in which is mounted the cross bar or head 44 which serves as a key and engages in the internal grooves 45 provided on the tubular member 46 which telescopes within the member 37 so as to be housed within the same. The tubular member 46 embraces the shaft or driving member 28 and is provided with a pair of grooves 47 with which the inwardly extending lugs 48 on the nut 49 engage. The nut 49 is externally threaded as indicated at 50 and engages screw-threadedly with the internal screw-thread 51 provided on the tubular member 37. The nut 49 is provided with projections 52 extending endwise therefrom and having the grooves 53 aligning with the grooves 54 in the projections 55 provided on the tubular member 56. A spring locking ring 67 engages with the grooves in the projections 52 and 55 when the projections are moved into interfitting relation as shown in Fig. 1, the joint form being quite similar to that between the member 37 and the nut 31.

It will be seen that as the driving member or shaft 28 is rotated, the same will rotate the tubular member or sleeve 46 which in turn will rotate the nut 49. As the nut 49 is in screw-threaded engagement with the internal threads of the tubular member 37, the nut will travel along said threads as the member 28 is rotated. It will be noted that the threads on the nut 49 are opposite in pitch to the threads on the shaft 28. Thus, the nut 49 will travel in the same direction as the tubular or extensible member 37 and will carry with it the tubular member 56. As a result, the tubular member 56 will be extended relative to the extensible member 37, which in turn will be extended relative to the base or casing 10 as the shaft 20 is rotated by means of the handle. Mounted on the tubular member 56 is a cap 57 secured in any suitable manner, a bearing member 58 being secured thereto so as to swivel relative thereto by means of the rivet 59.

A cross pin 60 is provided for securing the key or bar 44 in position. The end of the pin 60 projects beyond the shaft 28 into the internal groove 61 provided in the member 46. A lip or projection 62 is struck inwardly from the material of the tubular member 46 forming a stop member with which the projecting portion of the pin 60 is adapted to engage to thus prevent complete disengagement be-

tween the shaft 28 and the tubular member 46. However, in the normal operation of the device, the pressure exerted by the jack will not bear against the pin 60, but the cross member 44 will engage with the nut 32 before the pin 60 engages with the finger or lug 62 as the nut travels along the threaded shaft or driving member 28.

The adjustable flanged sleeve 24 is locked in position by means of the lock nut 63. The casing 10 is provided on the vertically extending tubular portion 11 thereof with the laterally extending lug or projection 64 which is of a shape to correspond with the shaft of the socket in the handle for turning the shaft 20 and is slightly inclined so as to have the handle project slightly upwardly. It will be evident that if the socket of the handle member that is used for operating the jack is engaged with the projection 64, an elongated handle is provided for the jack which is detachable and which may be used to move the jack undereneath an automobile or some out of the way place where it is desired to put the same to operate the jack. The ends of the grooves 47 are closed by means of the sloping end walls 65 to thus limit the movement of the nut 49 relative to the member 46 and preventing the same from leaving the member 46 at the upper end thereof.

It will be seen from the above that a simple and compact jack is provided that is made up of a number of telescoping members and that the only exposed portions of the jack in extended position are smooth portions with no projections or threads thereon and that a pair of said tubular portions are simultaneously extensible, one relative to the base and the other relative to the first mentioned extensible member, the driving means for said second extensible member comprising a tubular member that is freely slidable relative to the first member, thus providing a positive driving connection for the second extensible member for all positions of the first extensible member, said drive never interfering with the operation of either of said members.

The thread 31 is of slightly greater pitch than the thread 51, thus making the member 37 travel at a greater linear speed than the member 56. These threads are so proportioned that when the members reach their greatest extended position, the member 56 will be telescoped substantially the same distance within the member 37 as said member 37 is telescoped with the housing 11.

Having thus described my invention what I desire to claim and secure by United States Letters Patent is:

1. In a device of the character described, a base member, a member extensible therefrom, a second member extensible from said first member, and means for simultaneously extending said members comprising a rotatable driving member and means connecting said driving member with said first extensible member so as to extend the same upon rotation of said driving member, and means comprising a member mounted to turn with said driving member and axially movable relative to the driving member and rotatable relative to said first extensible member for extending said second extensible member.

2. In a device of the character described, a base member, a member extensible therefrom, a second member extensible from said first member, and means for simultaneously extending said members comprising a rotatable driving member and means connecting said driving member with each of said extensible members so as to extend the same upon rotation of said driving member, said means including a member for extending said second extensible member mounted to turn with said driving member and movable axially relative thereto and relative to and independently of said second extensible member.

3. In a device of the character described, a base member, a member extensible therefrom, a second member extensible from said first member, and means for simultaneously extending said members comprising a rotatable driving member and means connecting said driving member with each of said extensible members so as to extend the same upon rotation of said driving member, said means including a member mounted to turn with said driving member and axially movable relative thereto and movable relative to and independently of one of said extensible members.

4. In a device of the character described, a base member, a member extensible therefrom, a second member extensible from said first member, and means for simultaneously extending said members comprising a rotatable driving member and means connecting said driving member with each of said extensible members so as to extend the same upon rotation of said driving member, said means including a member freely slidable relative to one of said extensible members and mounted to rotate with said driving member.

5. In a device of the character described, a base member, a member extensible therefrom, a second member housed within and extensible from said first member, and means for simultaneously extending said members comprising a rotatable driving member and a floating member housed within said second extensible member when the jack is collapsed and mounted to rotate with said driving member but free to slide relative to one of said extensible members and said driving member.

6. In a device of the character described, a base member, a member extensible therefrom, a second member housed within and

extensible from said first member, and means for simultaneously extending said members comprising a rotatable driving member and a floating member housed within said second extensible member when the jack is collapsed and mounted to rotate with said driving member, but free to slide relative to one of said extensible members and to said driving member, said driving member being mounted within said floating member.

7. In a device of the character described, a base member, a member extensible therefrom, a second member extensible from said first member, and means for simultaneously extending said members comprising a rotatable driving member and means connecting said driving member with each of said extensible members so as to extend the same upon rotation of said driving member, comprising a freely slidable member mounted to rotate with said driving member, and means for limiting the outward sliding movement of said slidable member.

8. In a device of the character described, a base, a member extensible therefrom, means for holdinig said member from rotation relative to said base, a second member extensible from said first member, and means for simultaneously extending said members, said means comprising a rotatable driving member and means forming screw threaded connection with said first extensible member and including an axially movable member mounted to rotate with said driving member and a member mounted to rotate with said axially movable member and having screw-threaded engagement with said first extensible member and movable relative to said axially movable member.

9. In a device of the character described, a base, a member extensible therefrom, means for holding said member from rotation relative to said base, a second member extensible from said first member, and means for simultaneously extending said members comprising a rotatable driving member and means forming screw threaded connection with said first extensible member and including an axially movable member mounted to rotate with said driving member and a member mounted to rotate with said axially movable member and having screw-threaded engagement with said first extensible member and movable relative to said axially movable member, the thread pitch of said last mentioned threaded engagement being less than the thread pitch of the first mentioned threaded engagement.

10. In a device of the character described, a base member, a member extensible therefrom, and means for extending said extensible member comprising an elongated screw-threaded member and a nut having screw-threaded engagement therewith, said nut and extensible member having interfitting grooved portions and a spring locking member engaging said grooves to secure said nut non-rotatably to said extensible member.

11. In a device of the character described, a base member, a member extensible therefrom, a second member extensible relative to said first member and means for extending said second extensible member comprising an elongated screw-threaded member and a nut having screw-threaded engagement therewith, said nut and extensible member having interfitting grooved portions and a spring locking member engaging said grooves to secure said nut non-rotatably to said second extensible member.

12. In a jack, the combination of a housing, a rotatable bevel gear mounted in the base of said housing and having an upstanding portion, a lifting member having a work engaging surface at its top, and a connecting member substantially co-extensive in length with the lifting member and operatively connected therewith and with the upstanding portion of the bevel gear, and a sleeve operatively associated with the lifting member and free from direct connection with the connecting member and slidably splined to the housing to cause the simultaneous projection of the lifting member and sleeve on operation of the upstanding portion, and said sleeve having an imperforate and substantially smooth exterior and constructed and arranged when the jack is in extended position to form with the housing and the lifting member, an enclosing housing for the connecting member whereby to exclude dirt from the interior of the jack.

13. In a lifting jack having a pedestal, the combination of a driving member mounted in the pedestal, a bevel gear formed and arranged at one end of the driving member and extending outwardly thereof for moving the same, a lifting member having telescopic relationship with the driving member and a second lifting member having telescopic relationship with the first lifting member, said driving member having a driving connection with the first mentioned lifting member, and said lifting members having screw threaded interconnection and arranged so that the second lifting member substantially encloses the driving member and is substantially positioned at one end adjacent said outwardly extending bevel gear when the jack is in collapsed position, and means for preventing rotation of said second lifting member during its longitudinal movement.

14. In a jack, the combination of a pedestal forming an enclosing housing, a rotatable upstanding threaded member mounted in said pedestal, a load carrying member having a threaded portion, an elongated member having telescopic relationship with the load carrying member, said elongated member having operative connections with the

upstanding threaded member and with the load carrying member, said elongated member being axially projectable with respect to the upstanding threaded member, and a sleeve wholly separate from the elongated member and having operative connection with the load supporting member and the base whereby on rotation of said upstanding threaded member, said sleeve will cause the projection of said load supporting member from said pedestal to a distance substantially equal to the height of the pedestal, the height of the driving member and the height of the load supporting member and whereby said sleeve will be projected simultaneously with said load supporting means.

15. In a jack, the combination of a pedestal forming an enclosing housing, a rotatable upstanding threaded member mounted in said pedestal, a load carrying member having a threaded portion, an elongated member having telescopic relationship with the load carrying member, all portions of said load carrying member lying concentrically outside of the exterior walls of the elongated member, said elongated member having operative connections with the upstanding threaded member and with the load carrying member, said elongated member being axially projectable with respect to the upstanding threaded member, and a sleeve wholly separate from the elongated member and having operative connection with the load supporting member and the base whereby on rotation of said upstanding threaded member, said sleeve will cause the projection of said load supporting member from said pedestal to a distance substantially equal to the height of the pedestal, the height of the elongated member and the height of the load supporting member, said load carrying member and said sleeve having relatively smooth and imperforate outer surfaces and being constructed and arranged when in extended position to cooperate with the pedestal to form a continuous dirt-proof housing for the upstanding threaded member and the elongated member.

16. In combination, a jack having a housing and four telescoping members capable of relative projection with respect to each other, one of said members having a threaded portion upstanding in said housing and having means formed and arranged at one end thereof for rotating the same, the second of said members having a load carrying cap at its top, the third member being longitudinally movable with respect to the first and second members, and means forming a driving connection therebetween, the fourth member comprising an imperforate sleeve arranged to operate independently of the third member and adapted to exclude dirt and dust from the third member when the jack is in extended position, said sleeve being splined to the housing to prevent relative rotation therebetween.

17. In combination, a jack having a housing and four telescoping members capable of relative projection with respect to each other, one of said members having a threaded portion upstanding in said housing and having means formed and arranged at one end thereof for rotating the same, the second of said members having a load carrying cap at its top, the third member being longitudinally movable with respect to the first and second members, and operating wholly within the innermost peripheral wall portions of the second member, and means forming a driving connection therebetween, the fourth member comprising an imperforate sleeve arranged to operate independently of the third member when the jack is in extended position, said sleeve being splined to the housing to prevent relative rotation therebetween.

18. In combination, a jack having a housing and four telescoping members capable of relative projection with respect to each other, one of said members having a threaded portion upstanding in said housing, and having means formed and arranged at one end thereof for rotating the same, the second of said members having a load carrying cap at the top, the third member being longitudinally movable with respect to the first and second members, and means forming a driving connection therebetween, the fourth member comprising an imperforate sleeve arranged to operate independently of the third member and adapted to exclude dirt and dust from the third member when the jack is in extended position, said sleeve being splined to the housing to prevent relative rotation therebetween, and said sleeve having an operative connection with one of said members to cause said sleeve to project simultaneously with the second of said members.

In witness whereof, I have hereunto subscribed my name.

ADOLPH PETELER.