

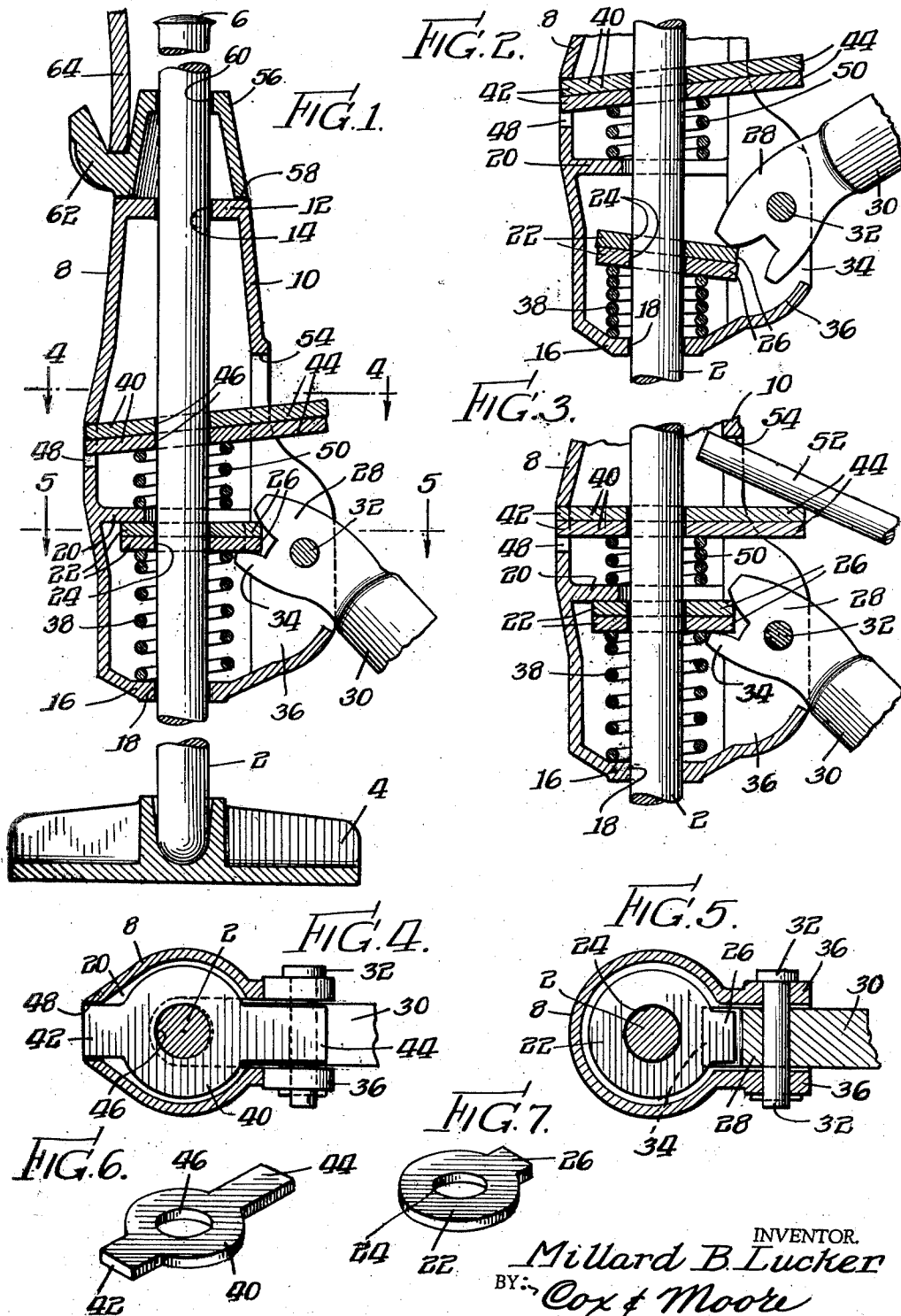
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JACK

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JACK

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13 Claims. (Cl. 254—106)

This invention relates to a pushing and pulling device and more particularly to a device adapted to be used as an automobile jack or as a portable automobile body repair tool.

5 The invention is particularly adaptable to a jack or repair tool of the so-called friction grip type, which includes a relatively long supporting rod on which a housing is adapted to be moved by means of one or more clutches pivotally
10 mounted within or on the housing and adapted alternately to grip and release the rod, whereby the housing which carries the load, in the case of a jack, is propelled upwardly along the housing to lift the load. Among the objects of my invention are to provide an improved construction
15 for a device of the foregoing character, wherein there is provided actuating and/or releasing clutch constructions formed of a plurality of plates or layers, as for instance a two-layer or two-plate clutch, for actuating and/or for holding the housing in gripping relation with the longitudinal rod, whereby to provide a more effective
20 gripping action during the canting of the clutches, and whereby to provide a more effective interaction between the housing and the clutches; to provide these and other objects of invention as will be apparent from a perusal of the following specification when taken in connection with the accompanying drawing, wherein:

30 Fig. 1 is a side sectional view of one form of my improved construction particularly illustrated in the form of a jack;

Fig. 2 is a detail sectional view showing the operation of the actuating or lifting clutch in its support gripping position;

35 Fig. 3 is a view similar to Fig. 2, showing the holding clutch in released position;

Fig. 4 is a sectional view taken on line 4—4 of Fig. 1;

40 Fig. 5 is a sectional view taken on line 5—5 of Fig. 1;

Fig. 6 is a perspective view of one layer of the holding clutch; and

45 Fig. 7 is a perspective view of one layer of the actuating or lifting clutch.

Referring now to the device in detail:

In general my invention comprises an elongated upright 2 preferably formed as a rod or tube and preferably of circular cross section, although it
50 may be polygonal in cross section. This upright 2 is supported in any suitable base 4, with which it makes a detachable friction grip whereby the elongated support 2 is held in generally upright position. The upper portion of this elongated
55 support 2 is preferably peened over slightly, as at

6, to form a stop or head which is adapted to contact with a portion of the saddle support hereinafter described, to prevent detachment of the saddle support from the housing and from the support 2.

Cooperating with the elongated upright 2 is a housing 8 of preferably cylindrical cross section in part and preferably considerably elongated in the direction of the upright 2. This housing is formed preferably as a one-piece or integral
10 metal casting, although it may be in some instances formed of heavy gauge pressed sheet metal or steel construction. The housing includes at its upper portion a substantially elongated sleeve-like member 10 having the upper
15 end inwardly extending, as at 12, and formed with an opening 14 which closely surrounds the upright 2 and providing an upper bearing of the housing for this upright 2.

The upper portion of the housing, as at 12, is
20 formed as a substantially horizontal platform when the housing is in vertical position. The central portion of the housing is formed as a means for supporting the lifting and holding clutch mechanism, whereby the housing is vertically shifted along the upright 2. The bottom
25 of the housing is provided with an inwardly extending partition 16 which has an opening 18 registering with the opening 14 of the flange 12. This bottom inwardly projecting flange 16 forms a bottom bearing for the upright 2. The housing is provided with an internally projecting flange 20
30 located between the two flanges 12 and 16, which flange forms a dividing abutment and pivot for the actuating clutch.

The actuating clutch is preferably formed of a plurality of elements shown specifically in Fig. 7. They comprise a preferably round, washer-like shaped, sheet metal stamping 22 having an opening 24 centrally thereof and a laterally projecting
40 actuating lug 26. There are preferably two of these sheet metal elements which are superimposed and have their openings 24 registering to receive therethrough the upright 2. The rear-most edge of the uppermost element abuts against
45 the upper face of the inward projection 20, whereby to form a pivot to permit these actuating plates to be tilted with respect to the rod or upright 2. The inner edges of the openings 24 form biting or gripping jaws adapted, when the clutch is tilted, to grip the upright and whereby the housing may be advanced upwardly of the rod
50 2. The outer end of this clutch plate 22 is adapted detachably to fit within a furcation 28 of an operating lever 30 detachably pivoted to the hous- 55

ing, as at 32, through a longitudinal slot 34 formed in the front wall of the housing. For this purpose the walls of the housing 8 project forwardly, as at 36, to form spaced apart cheeks.

5 These cheeks are perforated to receive the pivotal pin 32. The end of the lever 30 may be of sufficient length to permit the clutch-like member to be shifted angularly and whereby upon oscillation of this lever 30 the housing 36 will be lifted

10 upwardly along the rod 2, by the gripping action of this lifting clutch 22. A spring 38 is coiled between the upper face of the inwardly extending flange 16 and takes against the under side of the lower layer of the clutch member 22 whereby to

15 keep the clutch normally upwardly against the under surface of the inwardly extending partition 20.

The holding clutch plates, one of which is shown in perspective in Fig. 6, are formed somewhat similarly to the lifting clutch, being provided with a central relatively round or washer-like portion 40 provided with an integral diametrically extending lug 42 and an oppositely extending operating lug 44. The central opening 46 registers with the central opening of the other layer or plate of this holding clutch. The holding clutch is preferably formed of stamped sheet metal, and like the operating clutch is preferably hardened to give it proper wear.

20 The two layers of the holding clutch are placed in superimposed relation and are adapted to have their registering ends 42 received in a slot 48 in the housing 8 generally opposite the elongated slot 34. A spring 50, coiled between the upper

25 side of the flange 20 and the under side of the lower clutch section 40, normally tends to cant this clutch to the position shown in Fig. 1, such that it normally grips the upright 2 and holds the housing in fixed position relative to this rod.

30 Upon movement of the holding clutch to an uncanted position, as shown in Fig. 3, a releasing action is effected which permits the downward travel of the housing relatively to the upright 2. This releasing is effected by insertion of a rod

35 52 in the opening 34 on the under side of a bottom edge 54 of said opening of the housing, and by pressing slightly downwardly upon the upper face of the operating tongue 44 the holding clutch will be shifted to uncanted position.

40 The load supporting member preferably comprises a conically shaped sleeve or ring 56 having a bottom edge 58 and an upper opening 60 registering with the opening 14 of the main housing. This load support is provided with a projecting saddle in the form of a laterally extending

45 prong 62 which is adapted to receive, for instance, a bumper support 64 for raising an automobile from the ground. By forming this load support as an independent element, I am enabled considerably to decrease the cost of manufacture of the jack housing; to bring the saddle, which receives the weight of the load, much closer to the longitudinal axis of the rod 2, whereby to

50 eliminate undue lateral strain of the housing on the upright 2 during the lifting and releasing operation, thereby making the operation of the jack much smoother and easier in actuation; and I am enabled to place the upper bearing 12 at the maximum distance from the lower bearing 16,

55 thereby providing a greater distance between these bearings and thereby reducing to a minimum the lateral tilting or shifting of the rod or upright 2 relative to the housing. In addition, by forming this load support 56 as an entirely

60 separable and independent element from the

housing 8, I am enabled to permit it angularly to shift around the rod 2. The head 6 on the upper end of the rod maintains this load support 56 in assembled relation with respect to the housing 8 and to the rod 2.

During assembly of the jack, the rod is inserted through the load support 56 and housing 10, the clutch members and operating levers and springs having been inserted through the opening 34, and then the base 4 is attached to the lower end

10 of the upright 2 by means of its friction grip, whereby to produce a completely assembled job.

By forming the clutches of sheet metal and forming them in superposed layers or sections, I am able to provide a much cheaper type of construction and likewise to form the gripping edges more closely together so that with a minimum tilt I secure a maximum grip. In addition, I provide a plurality of gripping or biting contacts for each clutch, since there are two layers and each layer

20 will provide two oppositely disposed gripping contacts, making a total of four gripping contacts in all for each clutch. It will thus be seen that by my improved construction I have provided a very rugged, economical and simple type of jack

25 construction or construction adaptable in certain instances as a body repair kit tool. In the event that the device is used as a body repair kit tool, the upper load member 56 is removed and the upper and lower portions of the housing are 30 suitably threaded.

In some instances I prefer to make the housing body of the jack of sheet metal construction, for instance as shown in my prior application Serial No. 74,969, filed April 17, 1936, in which case

35 the relative sliding movement of the two clutch sections during their canting will tend to provide a certain amount of flexibility to offset any binding action due to any possible lateral movement of the sheet metal housing relatively to the support rod during operation of the jack.

The claims of this application are directed more particularly to the laminated clutch construction, claims to other features of the device shown being presented in applications of applicant copending herewith, including applications, Serial No. 43,752, filed October 5, 1935; Serial

40 No. 74,969, filed April 17, 1936; Serial No. 101,693, filed September 21, 1936, and Serial No. 184,174, filed January 10, 1938.

It is obvious that various changes may be made in the specific embodiment of the invention set forth for purposes of illustration without departing from the spirit of the invention. The invention is accordingly not to be limited to the precise

45 embodiment shown, but only as indicated in the following claims.

Having thus described the invention, what is claimed as new and is desired to be secured by

50 Letters Patent is:

1. In a device of the class described, the combination of an elongated rod forming a support, a housing adapted to slide along said rod, clutch means pivotally mounted on said housing and

55 having an opening therethrough through which said rod is adapted to pass, said clutch means being formed of a plurality of separable layers, and means for actuating said clutch means to cause the same to grip the rod and to propel the housing along said rod.

2. In a device of the class described, the combination of an elongated rod forming a support, an elongated housing having an opening through which the rod is adapted to pass, clutch means

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pivotally mounted within said housing and having an opening through which the rod is adapted to pass, said clutch means being formed of sheet metal stampings lying in superposed relation upon each other, and means for causing said clutch means to grip and to release said rod.

3. In a device of the class described, the combination of an elongated rod forming a support, an elongated housing having an opening through which the rod is adapted to pass, clutch means pivotally mounted within said housing and having an opening through which the rod is adapted to pass, said clutch means being formed of sheet metal stampings lying in superposed relation upon each other, and means for causing said clutch means to grip and to release said rod, the opening in said clutch means forming biting jaws grippingly to engage said rod.

4. A clutch for devices of the class described formed of a plurality of layers of sheet metal disposed in superposed registering relation, each layer including a generally circular central portion provided with a hole therethrough and substantially diametrically oppositely extending lugs, one of said lugs forming a pivot for the clutch and the opposite lug being constructed and arranged to receive an operating lever, the edges of each layer at the hole forming gripping surfaces for the clutch.

5. A jack comprising a base, an upright rod, a housing adapted longitudinally to slide along said rod, said housing having registering apertures to receive the rod therethrough, the upper portion of the housing carrying a load-carrying member, clutch means mounted in said housing and having openings through which the rod will pass, said clutch means comprising a plurality of superimposed sheet metal stampings having gripping edges adapted to grip the supporting rod, and means for actuating the clutch means.

6. In friction jacks and the like, relatively movable members, one of said members taking the form of a relatively smooth surfaced bar, a friction clutch interposed between said members for transmitting the load from one member to the other, said clutch comprising a laminated structure built up from a plurality of relatively thin sheet metal plates slidable upon one another, spaced opposed portions of each plate defining an opening slightly greater than the thickness of said bar through which said bar extends, said opposed portions of said plates gripping said bar and assuming an individually canted position upon said bar when said laminated structure is canted as a unit.

7. In friction jacks and the like, relatively movable members, one of said members taking the form of a relatively smooth surfaced bar, a pair of friction clutches interposed between said members for transmitting the load from one member to the other, one of said clutches serving as a locking detent and the other of said clutches serving at an elevating detent, said clutches comprising a plurality of relatively thin plates slidable upon one another, spaced opposed portions of each plate defining an opening slightly greater than the thickness of said bar through which said bar extends, said opposed portions of said plates gripping said bar and assuming an individually canted position upon said bar when said clutches are canted as a unitary structure.

8. In friction jacks and the like, relatively movable members, one of which takes the form of a bar, a friction clutch interposed between said

members for transmitting the load from one member to the other, said clutch comprising a detent built up into one of requisite strength by superimposing a plurality of relatively thin metal plates freely supported upon one another, said plates having aligned openings through which said bar extends, each of said plates gripping said bar and assuming an individually canted position upon said bar when said clutch is canted upon said bar as a unit.

9. A friction clutch for jacks and the like, comprising a plurality of superimposed relatively thin metal plates, said plates being slidable upon one another and having aligned openings to receive a bar to be individually gripped by each plate when said clutch is in a canted position upon the bar.

10. In a lifting mechanism including a supporting column and a housing mounted for relative vertical movement with respect to said supporting column, a plurality of lifting plates within said housing disposed in superimposed relation with respect to each other, each of said lifting plates having an aperture therethrough through which said supporting column passes, means for simultaneously tilting all of said plates, said plates being slidable with respect to each other whereby when said plates are tilted, each may frictionally engage said column substantially independently of each other.

11. In a lifting mechanism including a supporting column and a housing mounted for relative vertical movement with respect to said supporting column, a plurality of lifting plates within said housing disposed in superimposed relation with respect to each other, each of said lifting plates having an aperture therethrough through which said supporting column passes, means for simultaneously tilting all of said plates, said plates being slidable with respect to each other whereby when said plates are tilted, each may frictionally engage said column substantially independently of each other, said plates being bodily vertically movable a substantial distance with respect to said housing, and resilient means for supporting said plates in predetermined position with respect to said housing.

12. In a lifting mechanism including a supporting column and a housing mounted for relative vertical movement with respect to said supporting column, a plurality of lifting plates within said housing disposed in superimposed relation with respect to each other, each of said plates having an aperture therethrough, through which said supporting column passes, means for simultaneously tilting all of said plates, said plates being slidable transversely with respect to each other, whereby when said plates are tilted each may frictionally engage said column substantially independently of each other, and a plurality of superimposed locking plates each similarly having an aperture through which said supporting column passes, and resilient means normally serving to tilt said locking plates whereby the same will each frictionally engage said lifting column.

13. A clutch for devices of the class described formed of a plurality of superposed sheet metal stampings having registering holes formed therein to receive a clutch supporting rod, the edges of the sheet metal stampings at the holes forming biting edges.

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