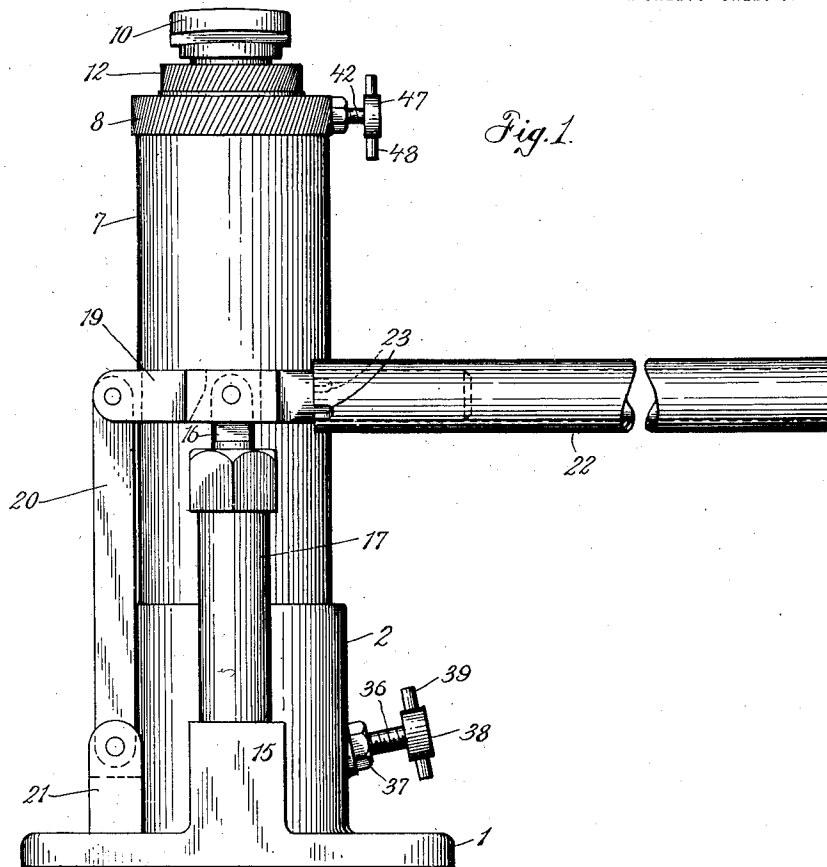
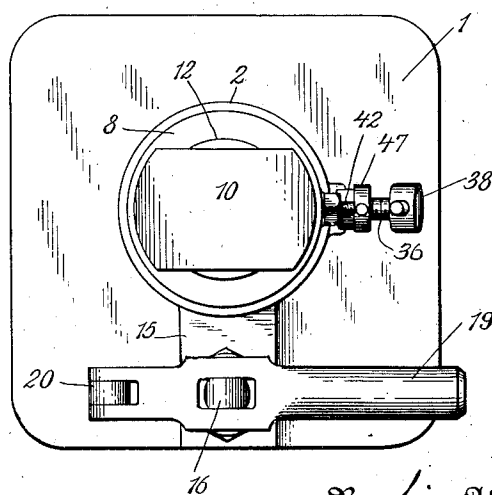


1,364,865.

G. CAPELL.
HYDRAULIC JACK.
APPLICATION FILED JAN. 21, 1920.

Patented Jan. 11, 1921.
2 SHEETS—SHEET 1.



Inventor
Gustav Capell
By his Attorneys
Hermann & Geier

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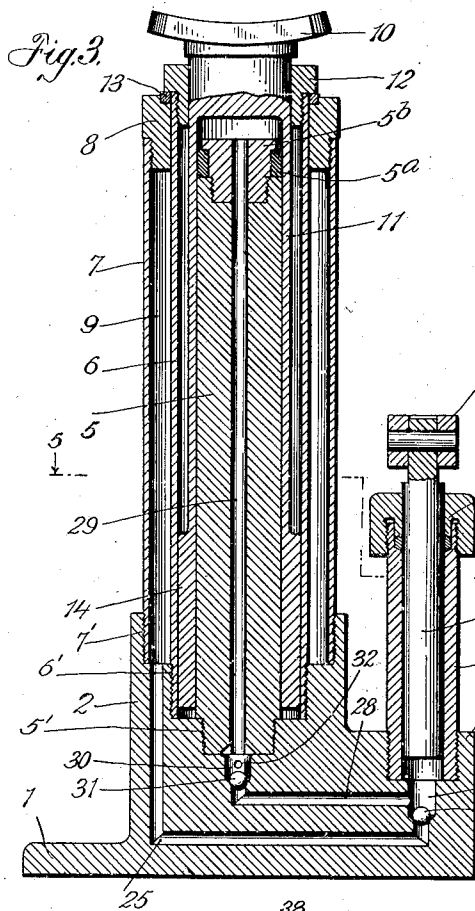
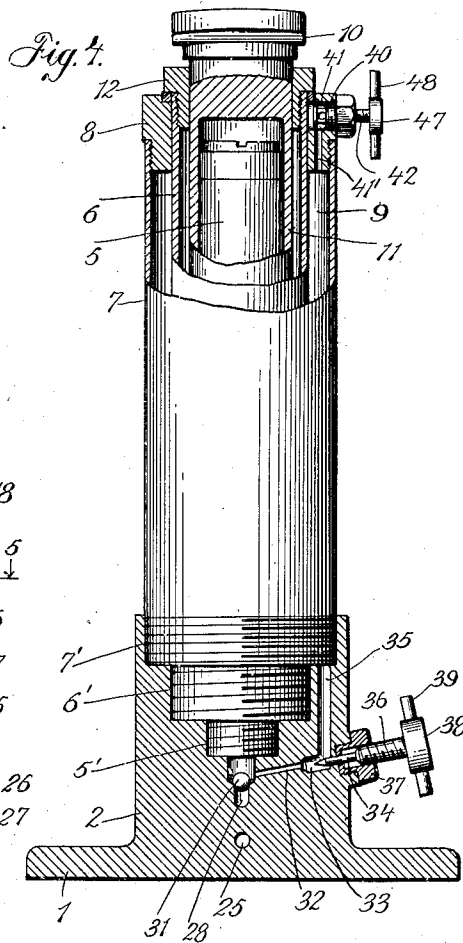
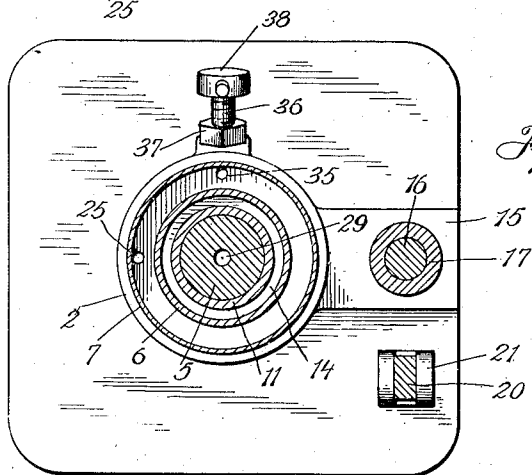
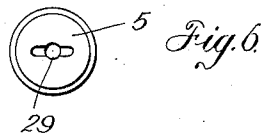
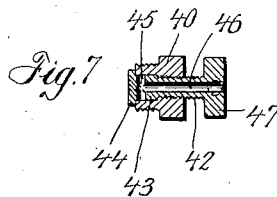


Fig. 5.



Gustav Capell Inventor
By his Attorneys
Reinhold J. J. J.

UNITED STATES PATENT OFFICE.

GUSTAV CAPELL, OF BROOKLYN, NEW YORK, ASSIGNOR TO CAPELL AND PRALL, OF BROOKLYN, NEW YORK, A COPARTNERSHIP COMPOSED OF GUSTAV CAPELL AND GUSTAV PRALL.

HYDRAULIC JACK.

1,364,865.

Specification of Letters Patent.

Patented Jan. 11, 1921.

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To all whom it may concern:

Be it known that I, GUSTAV CAPELL, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Hydraulic Jacks, of which the following is a specification.

This invention relates to a portable hydraulic jack, being intended more particularly for uses such as jacking up automobile wheels where a light but powerful jack is desirable or advantageous.

The invention has for an object to provide a portable hydraulic jack characterized by simplicity and compactness of construction, by great strength and rigidity in proportion to its weight, and by general ease of manipulation both in raising and lowering operations.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

Figure 1 of the drawings is a side elevation of a portable hydraulic jack constructed according to my invention.

Fig. 2 is a plan view thereof.

Fig. 3 is an axial sectional view thereof taken at right angles to Fig. 1.

Fig. 4 is a partial axial sectional view looking in the same direction as Fig. 1.

Fig. 5 is a horizontal section on the line 5-5 of Fig. 3.

Fig. 6 is a detail end view of the stationary plunger element.

Fig. 7 is a detail axial sectional view of the air valve on the reservoir.

In the present embodiment of the invention the jack consists briefly of a base upon which is supported a pump and a concentrically disposed liquid reservoir and cylinder. As here shown the base comprises a bottom flange 1 of rectangular shape in plan view formed with an integral upwardly projecting annular pedestal 2, to which a plurality of concentric cylindrical members are secured at their lower ends, the pedestal preferably being formed with a series of stepped recesses into which the said cylindrical members are screwed.

These cylindrical members comprise an inner member 5 which forms the fixed plunger

element of the jack and which is screwed at its lower end as at 5' into the pedestal. Spaced outwardly from this member 5 is an intermediate guide member 6 which forms the inner wall of the annular liquid receptacle and is screwed into the pedestal at its lower end as at 6'. Surrounding this intermediate member 6 is an outer casing member 7 which forms the outer wall of the liquid receptacle and is screwed into the pedestal as at 7'.

The space between the wall members 6 and 7 is closed at its upper end by a ring 8 which is screwed into the upper end of the member 7 and closely incloses the member 6, this space forming a reservoir 9.

The moving member of the jack comprises a head 10 suitably shaped as may be preferable for the use to which the jack is to be put, this head being rigidly fixed on and closing the upper end of a tube 11 forming the cylinder element of the jack, this tube extending downward between the plunger member 5 and the intermediate member 6 and fitting snugly upon the former and passing snugly through a flanged bushing 12 screwed into the upper end of the intermediate member. The flange of this bushing 12 preferably bears against a packing ring 13 of lead or other suitable material located in a suitable recess in the upper end of the ring 8, thus forming a tight joint between the ring 8 and the interior wall member 6. The plunger 5 may have a suitable packing ring 5^a on its upper end held in place by a screw plug 5^b. The lower end of this cylinder element 11 is preferably thickened as at 14 so as to bear slidably on the inner surface of the member 6, this thickened portion forming a shoulder adapted to engage the bushing 12 to prevent displacement of the cylinder element.

The pump of the jack is arranged vertically on a block-like offset 15 from the pedestal 2 and comprises a plunger 16 working in a cylinder 17 screwed into a recess in the top of the offset 15, the plunger extending upwardly through a stuffing box 18 on the upper end of the cylinder, and being attached at its upper end to an operating lever 19 between the ends of the latter. This lever is connected at one end to the upper end of a link 20 whose lower end is pivoted in a bracket 21 on the base-flange 1. The other end of the lever 19 is preferably of

circular cross section so as to receive a hollow handle 22 of any suitable length by which the lever is operated, this handle having diametrically opposed notches 23 formed in the end thereof for a purpose to be later set forth.

The connections between the pump jack proper and reservoir are as follows: From the reservoir 9 a passage 25 leads first downwardly and then horizontally through the base, and finally upwardly to communicate with the bottom of cylinder 17, the upturned portion being enlarged to form a valve chamber 26 for a ball valve 27 which prevents return flow of liquid to the receptacle from the pump. From the valve chamber 26 a passage 28 leads inwardly through the base above the passage 25 to the center of the pedestal, being upturned at its inner end to communicate with a central passage 29 leading upwardly through the entire length of the plunger 5. The portion of passage 28 immediately under the bottom of the plunger is enlarged as at 30 to form another valve chamber in which is located a ball valve 31 which prevents return flow of liquid from the jack cylinder to the pump. From the valve chamber 30 a passage 32 leads outwardly in a plane at right angles to the passages inclining slightly upwardly as shown. This passage is enlarged at its outer end as at 33 to form a chamber for needle valve 34, a vertical passage 35 leading from this valve chamber through the pedestal to the bottom of the receptacle 9. The needle valve 34 has an enlarged threaded stem 36 which is threaded through a bushing 37 screwed into the wall of the pedestal, this stem having a head 38 of a diameter to fit freely into the end of the handle 22, studs 39 projecting diametrically from opposite sides of this head.

I also preferably provide a valve controlled air vent through the upper end of the liquid reservoir and to this end a bushing 40 is screwed into an opening 41 in one side of the ring 8, a small vertical passage 41' leading downwardly through the ring from this opening. The bushing 40 has the stem 42 of a valve head 43 threaded there-through, the valve head 43 having a peripheral flange 44 on its inner end adjacent which are openings 45 leading diametrically through the wall of the head to a central passage 46 which extends outwardly through the stem 42. The stem 42 has a disk 47 on its outer end from opposite sides of which project the studs 48. It will be obvious that by rotating the stem 42 the flange 44 of the valve head will be moved into or out of contact with the inner end of the bushing 40, thus closing or opening the air passages 45 and 46.

It is believed that the manner of operation of my improved jack will be apparent

from the above description. Assuming the head 10 to be lowered and the air valve and needle valve 34 closed, the jack is placed in proper position and the air valve opened to permit of free access of air to the reservoir 9. It is to be noted that both the air valve and needle valve may be operated by placing the handle on the disk with the notches engaging the studs, the inclined arrangement of the needle valve being for the purpose of facilitating the operation thereof. The handle 22 is then placed on the lever and pump plunger reciprocated. Upon the upstroke of the plunger the liquid, preferably oil, flows from the receptacle 9 through passage 25 into the cylinder 17, lifting valve 27 from its seat. As the plunger descends valve 27 closes passage 25 and the liquid is forced through passage 28 and 29, lifting valve 31 from its seat and raising the cylinder element 11 on which is fixed the lifting head 10. The valve 31 prevents back flow from the cylinder element as the piston 16 again resumes its upstroke. When it is desired to lower the jack the needle valve is opened and the weight of the object upon the head causes the liquid to flow through passages 32 and 35 back to the reservoir 9, the needle valve and air valve being then preferably closed to retain the liquid in the reservoir irrespective of the position the jack may assume.

In connection with my improved jack it is to be noted that the disposition of the parts causes the jack proper to be braced by the walls of the reservoir and I thus obtain increased rigidity in addition to compactness of form. It will be noted also that the handle 22 and the valve operating disks 38 and 47 all extend in the same direction from the jack so as to all be easily reached when the jack is being used, as for instance to raise the wheel of an automobile.

Having thus described my invention what I claim as new and desire to protect by Letters Patent of the United States is as follows:

1. A portable hydraulic jack comprising a base, an annular reservoir fixed on said base, a fixed plunger element on said base concentric to said reservoir, a movable cylinder element whose upper end is adapted to engage the part to be lifted and whose lower end is open and projecting into the space between the said plunger and the inner wall of the said reservoir, means on the upper end of said reservoir slidably engaging and bracing said cylinder element, means for forcing the liquid from said reservoir into said cylinder element, and means for permitting back flow of said liquid to said reservoir.

2. A portable hydraulic jack comprising a base, an annular reservoir on said base, a fixed plunger element on said base concentric to said reservoir, a movable cylinder element whose upper end is adapted to engage the part to be lifted and whose lower end is open and projecting into the space between the said plunger and the inner wall of the said reservoir, means on the upper end of said reservoir slidably engaging and bracing said cylinder element, means for forcing the liquid from said reservoir into said cylinder element, and means for permitting back flow of said liquid to said reservoir.

5 tric to said reservoir, a movable cylinder
element whose upper end is adapted to en-
gage the part to be lifted and whose lower
end is open and projecting into the space
between the said plunger and the inner wall
of the said reservoir, means on the upper
end of said reservoir slidably engaging and
bracing said cylinder element, a pump lo-
cated on the said base at one side of the said
10 reservoir, a conduit leading from the bot-
tom of the said reservoir through the said
base to the said pump, a check valve in said
conduit, a second conduit leading from the
pump through the base and upwardly
15 through the said plunger element, a check
valve on said second conduit, and a third
conduit leading from the second conduit to
the said reservoir, and a manually operable
valve controlling the said third conduit.

20 3. A portable hydraulic jack comprising
a base, a fixed plunger element on said
base, a cylinder element slidable on said
plunger element, an annular reservoir sur-
rounding and bracing said cylinder element,
25 means for forcing the liquid from said res-
ervoir into said cylinder element, and means
permitting back flow of said liquid to said
reservoir.

30 4. A portable hydraulic jack comprising
a base, plunger and cylinder elements on
said base, an annular reservoir surrounding
said plunger and cylinder elements, a pump
for forcing the liquid from said reservoir
into the said cylinder element, a valve for
35 controlling back flow of liquid to said reser-
voir, a valve controlling an air vent to said
reservoir, said valves having handles adapt-
ed for operation by the operating handle of
the pump.

40 5. A portable hydraulic jack comprising
a base including a bottom flange and a ped-
estal, said pedestal having a lateral offset
from one side thereof, an annular reservoir
on said pedestal, a fixed plunger element on
45 said pedestal projecting upwardly from the
said pedestal concentric to the said reservoir
and spaced inwardly from the inner wall
of the latter, a movable cylinder element
surrounding said plunger element, and slid-
ably engaging both the latter and the inner
50 wall of the reservoir, a pump mounted on
said offset, conduits leading through said
base adapted to convey the liquid from said
reservoir to said pump and from the latter
55 to said cylinder element, and check valves
in said conduits.

6. A portable hydraulic jack comprising
a base including a bottom flange and a ped-
estal, said pedestal having a lateral offset
60 from one side thereof, an annular reservoir
on said pedestal, a fixed plunger element on
said pedestal projecting upwardly from the
said pedestal concentric to the said reservoir
and spaced inwardly from the inner wall of
65 the latter, a movable cylinder element sur-

rounding said plunger element, and fitting
snugly between the inner wall of the reser-
voir and the plunger element, a pump
mounted on said offset, conduits leading
through said base adapted to convey the
liquid from said reservoir to said pump and
from the latter to said cylinder element, and
check valves in said conduits, and an addi-
tional conduit leading from said cylinder
element back to said reservoir, and a manu-
75 ally operable valve controlling said last
mentioned conduit.

7. A portable hydraulic jack comprising a
base including a bottom flange and a pedes-
tal, said pedestal having a lateral offset from
80 one side thereof, an outer cylindrical casing
screwed at its lower end into said pedestal,
an intermediate cylindrical casing screwed
at its lower end into said pedestal, a ring
screwed into the upper end of the outer cas-
ing and closely engaging the intermediate
85 casing, a fixed plunger element screwed at
its lower end into said pedestal within and
concentric to the said casings, a movable cyl-
inder element inclosing said plunger ele-
ment and being in slidable engagement with
the inner wall of said intermediate casing, a
pump upon said offset, a conduit leading
90 from the space between the said casings
through the said base to the said pump, a
check valve in said conduit, a second con-
duit leading from said pump through said
base and plunger element, a check valve in
said second conduit, a third conduit leading
100 from a point on said second conduit above
the said check valve through the base to the
space between the said casings, a manually
operable valve on said third conduit.

8. A portable hydraulic jack comprising
a base including a bottom flange and a ped-
estal, said pedestal having a lateral offset
105 from one side thereof, an outer cylindrical
casing screwed at its lower end into said
pedestal, an intermediate cylindrical casing
screwed at its lower end into said pedestal,
a ring screwed into the upper end of the
outer casing and closely engaging the inter-
mediate casing, a fixed plunger element
screwed at its lower end into said pedestal
110 within and concentric to the said casings, a
movable cylinder element inclosing said
plunger element and being in slidable en-
gagement with the inner wall of said inter-
mediate casing, a pump upon said offset, a
conduit leading from the space between the
said casings through the said base to the said
115 pump, a check valve in said conduit, a sec-
ond conduit leading from said pump
through said base and plunger element, a
check valve in said second conduit, a third
120 conduit leading from a point on said second
conduit above the said check valve through
the base to the space between the said cas-
ings, a manually operable valve on said
third conduit and a manually operable valve
125 130

on the said ring controlling an air vent to the space between the said casings.

9. A portable hydraulic jack comprising a base including a bottom flange and a pedestal, said pedestal having a lateral offset from one side thereof, an outer cylindrical casing screwed at its lower end into said pedestal, an intermediate cylindrical casing screwed at its lower end into said pedestal, a ring screwed into the upper end of the outer casing and closely engaging the intermediate casing, a fixed plunger element screwed at its lower end into said pedestal within and concentric to the said casings, a movable cylinder element inclosing said plunger element and being in slidable engagement with the inner wall of said intermediate casing, a pump upon said offset, a conduit leading

from the space between the said casings through the said base to the said pump, a check valve in said conduit, a second conduit leading from said pump through said base and plunger element, a check valve in said second conduit, a third conduit leading from a point on said second conduit above the said check valve through the base to the space between the said casings, a manually operable valve on said third conduit and a manually operable valve on the said ring controlling an air vent to the space between the said casings said manually operable valves and said pump being adapted for operation by a common handle.

In testimony whereof I have affixed my signature.

GUSTAV CAPELL.