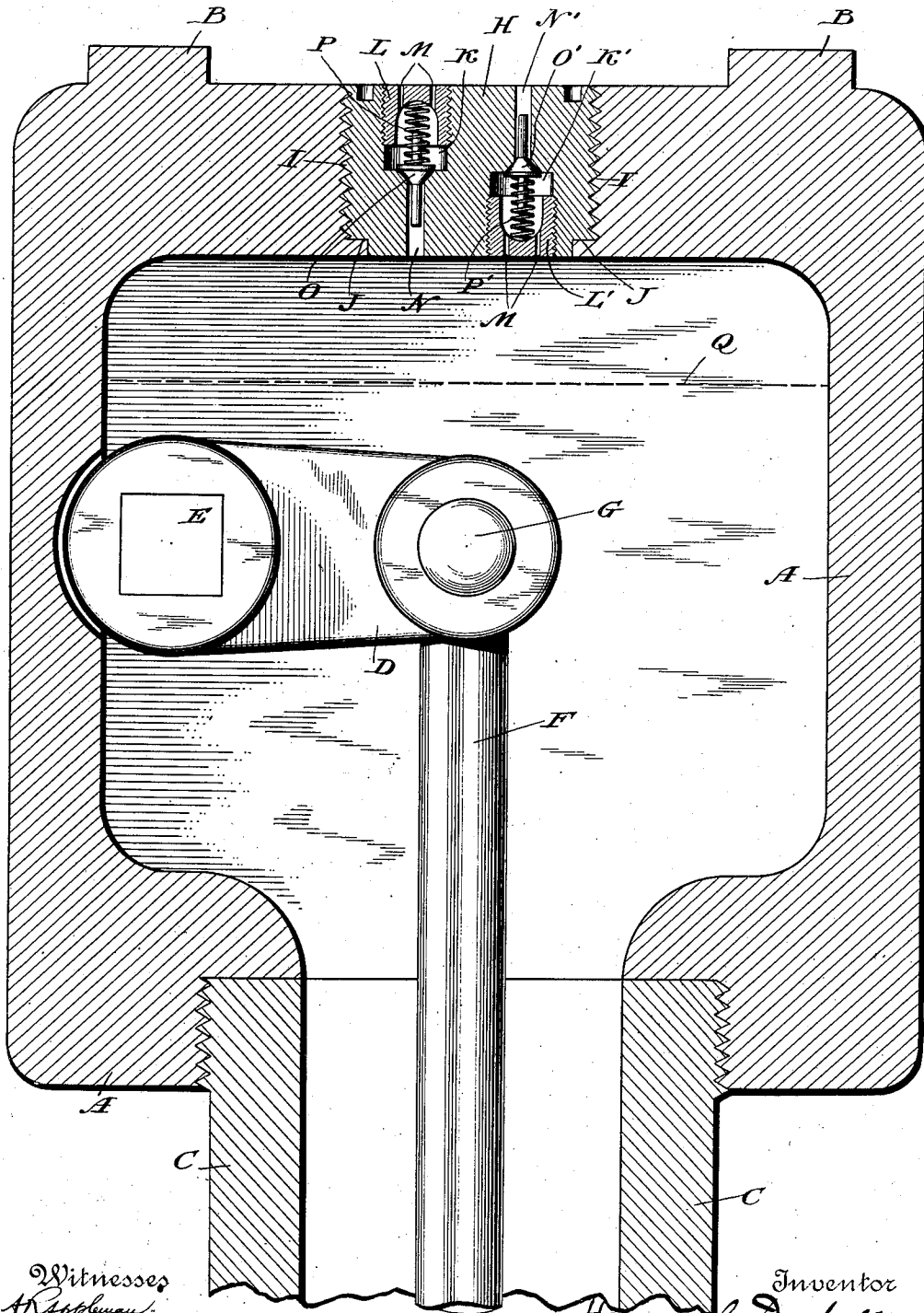


No. 848,641.

PATENTED APR. 2, 1907.

H. C. DUDGEON.
HYDRAULIC JACK.

APPLICATION FILED MAY 2, 1906.



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UNITED STATES PATENT OFFICE.

HENRY C. DUDGEON, OF LOCUST VALLEY, NEW YORK.

HYDRAULIC JACK.

No. 848,641.

Specification of Letters Patent.

Patented April 2, 1907.

Application filed May 2, 1906. Serial No. 314,841.

To all whom it may concern:

Be it known that I, HENRY C. DUDGEON, a citizen of the United States, and a resident of Locust Valley, Nassau county, Long Island, State of New York, have invented a new and useful Improvement in Hydraulic Jacks, of which the following is a specification, reference being had to the accompanying drawing, which illustrates a vertical sectional view of the head of a jack embodying the invention, certain parts being shown in elevation.

In the drawing I show the invention as applied to a common form of hydraulic jack—that is to say, one in which the head of the jack is made hollow, so as to contain the liquid, and I have shown it as mounted directly upon the upper end of the ram.

In apparatus of the class stated it is essential that the receptacle which contains the necessarily-present liquid shall be provided with an air-vent, so that as the liquid is pumped from this receptacle into the force-chamber air entrance may be afforded to break the vacuum which would otherwise be formed and likewise so that air may be ejected from the receptacle upon the return of the liquid thereto when it is desired (as it is called) to "lower" the jack. As heretofore constructed the air-vent has been of such character that it was permanently open, thus permitting entrance and exit of the air at all times, and consequently, also, permitting constant vaporization of the liquid which is usually quite volatile or its outflowing in the event that the jack becomes upset or left in any position other than that in which the liquid would remain in the receptacle under the action of gravity, and since hydraulic jacks are frequently subjected to very rough treatment in the hands of a class of workmen who are not specially observant or careful by custom it very frequently happens that the air-valve will not be closed when the instrument is not in use, in which event the liquid will flow out, thus rendering the apparatus useless until it is recharged.

The purpose of the present invention is therefore to obviate these objections.

In the drawing, A represents the head of the jack. B B are two of the lugs usually cast on its upper surface. C is the ram of the jack. D is the pump-knuckle; E, the shaft of the knuckle. F is the piston-rod. G is the crank-pin on which the piston-rod

rocks. All these parts may be of any usual construction.

H is a block of metal threaded on its periphery, as shown at I I, into a suitable recess made in the head of the jack. I prefer to provide shoulders J J at or near the lower end against which the block may be screwed down tight.

K K' are two threaded recesses made in the block H, one opening at its upper, the other at its lower, end.

L L' are two bonnets which are screwed into the threaded recesses K K' and are each provided with air-inlet openings M M', respectively, and there may be as many of these openings as preferred.

N N' are two passage-ways made through the block H, connecting with the recesses K K', respectively. The passage-way N opens inwardly into the head of the jack, and the passage-way N' outwardly into the open air.

O O' are two check-valves, each provided with spindles, as shown, and P P' are the springs which normally reseal these valves upon their respective seats in the passage-ways N N', as shown.

Q may be assumed to be the level of the liquid in the head of the jack.

The operation is simple. Upon working the pump the liquid is drawn from the cavity within the head A, passed down through the piston of the pump and by it forced into the force-chamber beneath the ram in the ordinary way. As soon as any considerable amount of the liquid has thus been removed from the head the tendency to produce a vacuum therein arises. When the pressure incident thereto is sufficient to overcome the resiliency of the spring P', the valve O' will be forced off its seat by atmospheric pressure, and air will enter through the valve O', passing inwardly through the opening N' into the head, thus relieving the vacuum. In this way it will be seen that air is supplied to the cavity within the head from time to time, as required, by the subsidence of the liquid therefrom, and also that at all times, excepting the periodical moments when the valve is opened for the admission of the air, the spring P' will maintain the valve O' closed. Likewise after the ram has done its work and it is desired to lower the head, which may be effected in the ordinary way, the liquid will flow back again into the cavity in the head, thus tending to produce air-compression

therein, and as soon as the pressure equals that of the spring P the valve O will be lifted from its seat, permitting the air to escape through the passages N and M. As soon as the incoming of the liquid ceases—in other words, after the head has been lowered to the desired extent—the valve O will be automatically seated again by the spring P. In this way, it will be noted, by my invention I avoid the necessity for any manual act whatever. The devices automatically perform their work without intervention of any kind by the operator and without the exercise of any care, thoughtfulness, or intelligence by him, and that at all times, excepting the periodical moments when the valves are automatically opened, they remain closed, so that there is no opportunity for loss of liquid by vaporization or outflowing from the cavity in which it is contained.

It will be noted that under my invention the oppositely-acting spring-controlled valves are located within the wall of the reservoir—in other words, the head of the jack—and that they are bodily inclosed therein, free from distortion or disarrangement incident to the exceedingly rough usage that hydraulic jacks are subjected to, and that by the construction shown I solve a problem in the manufacture of hydraulic jacks, never heretofore adequately solved, so far as I am aware, in a most simple, durable, and effective manner.

I claim—

1. In an hydraulic jack, the combination of a reservoir in the head of the jack from

which the pump receives its supply of liquid, automatically-acting valves set within the wall of the reservoir without projection beyond its outer surface and which operate in reverse directions, connecting the interior of the reservoir with the external air.

2. In an hydraulic jack, the combination of a reservoir in the head of the jack from which the pump receives its supply of liquid, two valves set in the wall of the reservoir without projection beyond its outer surface, each having a reseating-spring, one adapted to be opened by pressure from within the reservoir outwardly, and the other by pressure from without the reservoir inwardly.

3. In an hydraulic jack, the combination of a reservoir in the head of the jack from which the pump receives its supply of liquid, a block threaded into the wall of the reservoir, the exterior surface whereof is flush with the exterior surface of the reservoir, openings through said block, valves seated therein no part of which project beyond the outer surface of the block, one adapted to be opened by pressure from within the reservoir outwardly and the other by pressure from without the reservoir inwardly and springs which normally reseal said valves.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY C. DUDGEON.

Witnesses:

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