No. 702,501. Patented June 17, 1902.

W. K. STANSBURY.

HYDRAULIC JACK.

(Application filed Mar. 6, 1902.)

(No Model.)

Fig. 4.

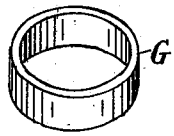


Fig. 5.

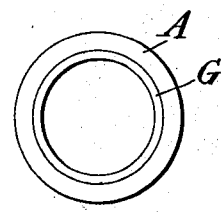


Fig. 1.

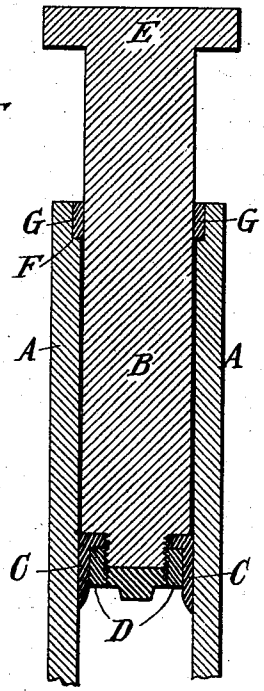


Fig. 2.

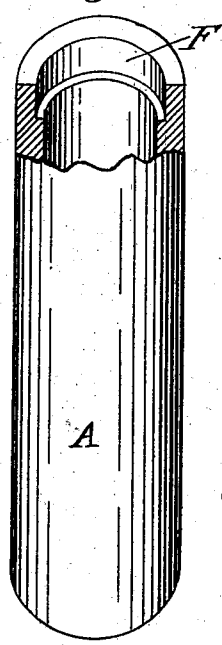
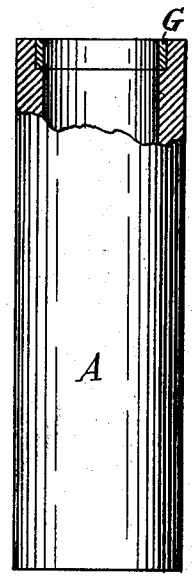


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM K. STANSBURY, OF MIDDLETOWN, NEW YORK, ASSIGNOR TO WILLIAM M. DUDGEON, EXECUTOR OF RICHARD DUDGEON, DECEASED.

HYDRAULIC JACK.

SPECIFICATION forming part of Letters Patent No. 702,501, dated June 17, 1902.

Application filed March 6, 1902. Serial No. 96,881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM K. STANSBURY, a citizen of the United States, and a resident at Middletown, Orange county, State of New York, have invented a certain new and useful Improvement in Hydraulic Jacks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 illustrates a vertical sectional view of the portions of the jack which are involved in this invention. Fig. 2 is an elevation, partially in section, of the cylinder of the jack, showing the seat for the ring which forms the subject-matter of this invention, the ring being removed, however. Fig. 3 shows a view similar to Fig. 2, the ring being in position. Fig. 4 is a perspective view of the ring itself. Fig. 5 is a plan view of the cylinder of the jack, showing the ring in position.

In hydraulic jacks as made to-day the cylinder as well as the ram are usually made of hardened steel, and it frequently happens that when the load is upon the jack, owing to settlement of the foundation of the jack or to shifting of the load or for some other cause, there is a stress brought to bear upon the head of the ram, which tends to throw it out of parallelism with the cylinder, so that on lowering the load the upper edge of the mouth of the cylinder will grind with great pressure against the side of the ram, sufficiently sometimes to seriously cut it. It frequently happens that repairs are necessary from this cause. Also, inasmuch as the rams do not usually fit the cylinders very closely, grit and dirt are apt to get in between the ram and the walls of the cylinder, which in time cut the cylinder and injure the packing, particularly when the ram is forced to one side or the other of the cylinder by reason of the shifting of the load or settling of the foundation.

By my invention I overcome both of the objections above stated and also secure another very desirable improvement—that is to say, I support the ram at the top of the cylinder by a relatively tight-fitting bearing, so that this bearing on the cylinder and the tight-fitting packing on the ram give duplex support for the ram, so that its sliding movement through the cylinder is firm, smooth, thoroughly supported, and reliable, whereby the axes of both maintain practically exact parallelism with each other, and certain practical advantages follow which are of great benefit.

In the drawings, A illustrates the cylinder; B, the ram; C, the packing, which may be of the ordinary cup-leather form. D is the packing-ring. E is the head of the ram. All of the parts above named may be of any preferred construction. At the upper end of the cylinder A, I counterbore a recess F, (see Fig. 2,) within which I place the ring G. This ring is a composition ring made up of suitable metals. I prefer to use tin, copper, and such other metals as will produce an alloy having the requisite hardness and yet be softer than the steel of the ram. The ring G is made of such size as to snugly fit the recess or seat F, counterbored in the upper end of the cylinder to receive it, and I prefer not to smooth the walls of the recess, but to leave them rough, as left by the counterboring-tool, so that when the ring G is by suitable devices expanded against the walls of the recess F it will be rigidly and permanently held therein by reason of the partially rough character of the walls. The ring, however, may be fastened within the recess in any other preferred manner—that is to say, it may be threaded to the cylinder in any suitable manner or keyed within the recess or otherwise held. The inside of the ring, preferably after it is rigidly attached to the cylinder, is bored out or dressed with accuracy, so that its interior diameter shall be approximately one one-hundredth of an inch smaller than the interior diameter of the bore of the cylinder itself. It may be of the same diameter as the cylinder; but if so it does not afford so effective support for the ram, nor does it act as a means to exclude grit, dirt, &c., so effectively as if it be smaller; yet it must not be materially smaller, because if so difficulty will be experienced in entering the ram-packing past this ring to its place within the cylinder.

It will be noted that the following important advantages flow from the stated improve-

ment. The interior diameter of the ring fits the exterior diameter of the ram with considerable snugness, so that although the ram will readily slide through the ring in the performance of its functions, as usual, nevertheless it will have little, if any, loose movement therein, and the packing at the lower end of the ram, which snugly fits the bore of the cylinder under the pressure exerted upon it, affords a substantially rigid bearing on the ram at that end. The result is that the ram is effectively supported by the ring and by the packing in such manner as that its axis is at all times practically coincident with that of the cylinder, so that there is little likelihood of the ram and cylinder ever being inclined relative to each other. If it should ever happen that they do become inclined relative to each other during the lowering of the load, there can be no cutting or shearing of the ram, because its bearing will be against the relatively soft composition ring, which will not be able to cut or mar the ram, and if after long-continued use the ring becomes distorted, worn, or expanded by the pressure that is exerted upon it it is an inexpensive and simple matter to take out the old ring and substitute a new one. Again, owing to the relatively snug fit between the ram and the ring the entrance of dirt or other foreign material, which has an injurious effect upon the packing and the inner face of the cylinder, is effectively prevented.

It will be obvious to those who are familiar with this art that the invention may be produced in a variety of modified forms. I therefore wish it to be understood that I do not limit myself to the form which I have illustrated and described as one example only. It is, however, a desirable form in which to construct the apparatus. In a twenty-ton jack, which may be taken as a criterion, I prefer that the composition ring should be from an inch to an inch and a half in depth and from a quarter of an inch to three-eighths of an inch in thickness. The interior diameter of such a ring and of the cylinder will be approximately three and a quarter inches. These proportions are given only as desirable ones.

Having described my invention, I claim—

1. In a hydraulic jack a cylinder having a ring at or near the upper end of its bore of softer material than that of the ram, for the purpose set forth.

2. In a hydraulic jack a cylinder having a ring at or near the upper end of its bore of softer material than that of the ram, the interior diameter of the ring being slightly less than that of the bore of the cylinder, for the purpose set forth.

3. In a hydraulic jack a cylinder having a recess formed at or near the upper end of its bore and a ring of softer material than that of the ram, rigidly fastened within said recess, for the purpose set forth.

4. In a hydraulic jack a cylinder having a recess formed at or near the upper end of its bore and a ring of softer material than that of the ram rigidly fastened within said recess, the interior diameter of the ring being slightly less than that of the bore of the cylinder, for the purpose set forth.

Signed at the city of New York this 28th day of February, 1902.

WILLIAM K. STANSBURY.

Witnesses:

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