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APPARATUS FOR ELIMINATING DENTS IN TUBES OR PIPES

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Fig. 4.

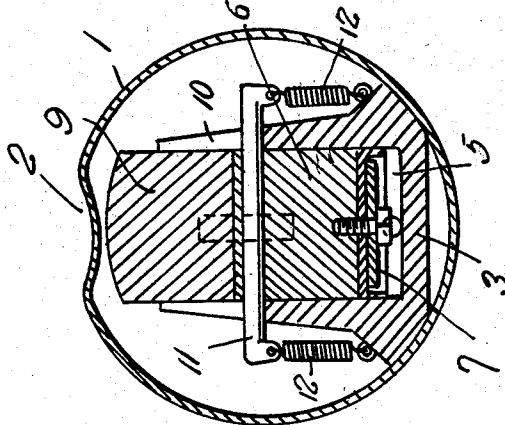
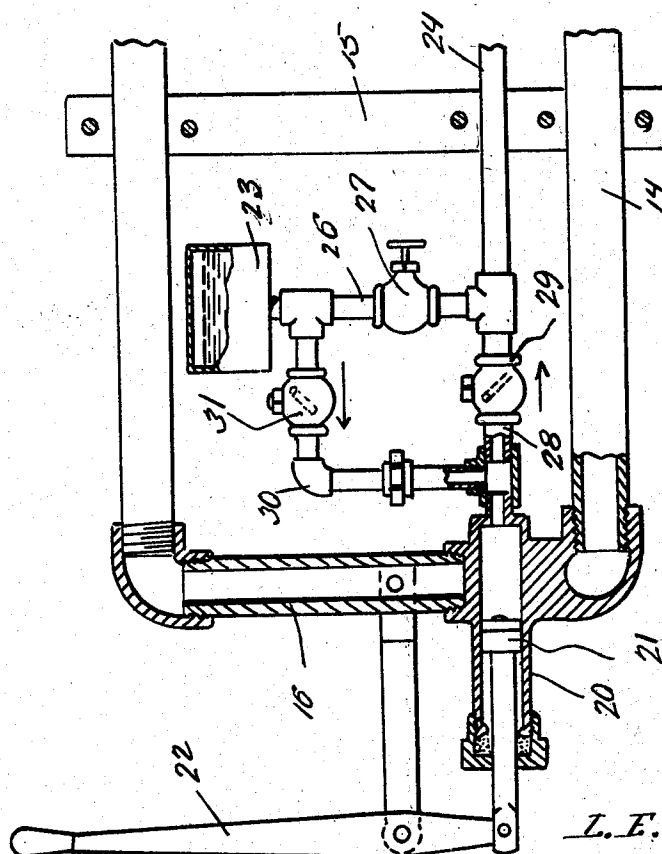


Fig. 3.



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APPARATUS FOR ELIMINATING DENTS IN TUBES OR PIPES.

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The object of my present invention is the provision of an apparatus of the type of a hydraulic jack, designed to be used to advantage in eliminating dents from tubes, pipes, well casings, and the like.

To the attainment of the foregoing, the invention consists in the improvement as hereinafter described and definitely claimed.

In the accompanying drawings forming part of this specification:

Figure 1 is a view partly in side elevation and partly in section illustrating the apparatus constituting the preferred embodiment of my invention as it appears in use.

Figure 2 is a fragmentary section illustrative of the jack portion of the apparatus.

Figure 3 is an enlarged fragmentary view partly in section and partly in elevation illustrative of the pump, the oil reservoir, the pipe connection and the valves comprised in the preferred embodiment of my invention.

Figure 4 is an enlarged cross section taken through a casing or tube and also through the jack portion of my novel apparatus.

Similar numerals of reference designate corresponding parts in all the views of the drawings.

In Figures 1 and 4 I show a tubular casing or tube 1 and I also show in the wall of said casing or tube 1 a dent 2, the purpose of my invention being to eliminate the said dents so as to restore to the casing or tube 1 the quality of being unobstructed interiorly throughout.

The jack portion of my improvement is designed to be inserted in a casing or tube after the manner shown in Figure 1, and toward the said end I provide a sled or shoe 3 on which is a pedestal 4, chambered at 5. I also provide in the said chamber 5 a plunger or jack 6 which is movable rectilinearly, and is provided with packing appropriately attached at 7, and is also provided at 8 with upwardly extending dowel pins, the said dowel pins being designed to cooperate with a plunger head 9 in such manner that the plunger head 9 is held in proper relation to the plunger 6 under working conditions, and yet when desired said head 9 may be expeditiously and easily removed to give place to a larger or smaller head 9, the heads 9 of various sizes being used in order to adapt the apparatus to casings or casing tubes or pipes of various diameters. I would

also have it understood that the wall of the pedestal 4 is vertically slotted as indicated by 10 in Figures 1 and 4, and that the plunger 6 is provided with a cross rod 11, movable in said slots 10 and connected to retractile springs 12 which are also connected to the base of the pedestal 4. The said retractile springs 12 in cooperation with a broad spring 13, Figures 1 and 2, are designed to retract the plunger 6—i. e. move said plunger downwardly when the pressure below the plunger is relieved as hereinafter set forth.

Manifestly, in this connection it will be appreciated that the jack portion of the apparatus may be readily withdrawn from a casing or tube 1 following downward movement of the plunger 6 and the release of pressure exerted against the under side of the said plunger 6.

Connected to and extending rearwardly from the sled runner or shoe 3 is a longitudinal bar 14 and connected at 15 and 16 with the said longitudinal bar 14 is a second longitudinal bar 17 on which is a pivoted pointer 18, said pointer being designed to normally rest in the position shown in Figure 1 and against a stop 19 and being adapted when not in use to be swung in the direction indicated by the arrow in Figure 1 into an upper idle position. In the use of my novel apparatus, the pointer 18 outside of the casing or tube serves to indicate the position within the tube or casing 1 of the center of the plunger head 9.

Appropriately connected with and carried by the frame formed by the elements 14, 15, 16 and 17 is a pump 20, the piston 21 of which is designed to be reciprocated through the medium of a hand lever 22.

At 23 is a reservoir for oil or other fluid that is desired to use in the apparatus. A pipe 24 is in communication at its forward end with a bore 25 formed in the pedestal 4 and leading to the bottom of the chamber in said pedestal 4 and it will also be understood that a pipe 26 is interposed between the reservoir 23 and the pipe 24 and is equipped with a cut off valve 27. It will also be understood that a pipe 28 connects the forward end of the cylinder of the pump 20 and the rear end of the pipe 24 and is equipped with a non-return valve 29, said valve 29 being arranged to open in the direction indicated by the arrow adjacent thereto.

The portion of the pipe 26 between the reservoir 23 and the cut off valve 27 is connected with the portion of the pipe 28 in rear of the non-return valve 29 through the medium of a pipe 30 in which is a non-return valve 31 designed to open in the direction indicated by the arrow adjacent thereto.

The preferred embodiment of my invention is readily portable, and it will be understood that in the practical use of the apparatus the said runner or shoe 3 and the parts thereon are moved endwise into a tubing or pipe 1 having a dent 2 until the plunger 18 indicates that the plunger head 9 is positioned below the dent to be eliminated. Upon the said accurate positioning of the plunger head 9, the valve 27 is closed and by manipulation of the hand lever 22, the pump piston 21 is actuated to force the fluid into the pipe 24 and to the chamber in the pedestal 4. The pressure built up in the manner described will bring about strong upward movement of the plunger 6 and the plunger head 9, with the result that the dent will be moved upwardly and will be eliminated and the interior of the tube or casing 1 will be restored to even diameter throughout its length.

It will be appreciated from the foregoing that my novel apparatus is adapted to be used with facility, and that it is susceptible of being operated with but little effort and is capable of removing dents from casings or tubes such as 1 without subjecting the casing or tubes to any injury whatsoever.

It will also be appreciated that my novel apparatus is free of delicate parts such as are likely to get out of order after a short period of use, and in this connection it will be understood that the operation of the springs 12 and 13 in lowering the plunger 6 serves to bring about the return of the oil or other fluid employed through the pipe 24 to the oil reservoir 23, the valve 27 being reopened for said purpose.

I have entered into the detailed description of the construction and relative arrangement of the parts embraced in the present and preferred embodiment of my invention in order to impart a full, clear and exact understanding of the said embodiment. I do not desire, however, to be understood as limiting myself to the structure disclosed, my invention being defined by my appended claims within the scope of which structural changes or modifications may be made without affecting or involving departure from my invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:—

1. An apparatus for eliminating dents from tubes, pipes and the like comprising a shoe or runner having a pedestal, said pedestal being chambered, a plunger movable

in the chamber of the pedestal, means for supplying fluid under pressure to the chamber below the plunger, and a pointer connected with the shoe or runner and adapted to operate exteriorly of a pipe, tube, or the like to indicate the position of the plunger within the pipe, tube, or the like.

2. An apparatus for eliminating dents from tubes, pipes and the like comprising a shoe or runner having a pedestal, said pedestal being chambered, a plunger movable in the chamber of the pedestal, means for supplying fluid under pressure to the chamber below the plunger, and a pointer connected with the shoe or runner and adapted to operate exteriorly of a pipe, tube, or the like to indicate the position of the plunger within the pipe, tube, or the like; the plunger being equipped with a removable head, and means for detachably retaining the head in working position on the plunger.

3. An apparatus for eliminating dents from tubes, pipes and the like comprising a shoe or runner having a pedestal, said pedestal being chambered, a plunger movable in the chamber of the pedestal, means for supplying fluid under pressure to the chamber below the plunger, a pointer connected with the shoe or runner and adapted to operate exteriorly of a pipe, tube, or the like to indicate the position of the plunger within the pipe, tube, or the like, a stop on the bar, and a pointer pivotally connected to said bar and adapted to bring up against said stop.

4. An apparatus for eliminating dents from tubes, pipes and the like comprising a shoe or runner having a pedestal, said pedestal being chambered, a plunger movable in the chamber of the pedestal, means for supplying fluid under pressure to the chamber below the plunger, a pointer connected with the shoe or runner and adapted to operate exteriorly of a pipe, tube, or the like to indicate the position of the plunger within the pipe, tube, or the like and spring means for returning the plunger to normal position when pressure is relieved below the plunger.

5. An apparatus for removing dents from pipes, tubes, and the like, comprising a plunger, means carrying the plunger and adapted to be positioned within a tube or pipe, and means for supplying fluid under pressure to the plunger carrying means for the purpose of forcing the plunger outwardly against a dent for the elimination of the latter; the said plunger being equipped with means for retracting the same when pressure is released at the inner end of the plunger.

6. Means for eliminating dents in tubes, pipes and the like comprising a plunger, means carrying the plunger and adapted to be introduced into a tube or pipe, means

for supplying fluid under pressure to the plunger carrying means, and a pointer adapted to operate exteriorly of a tube or pipe and connected and movable with the plunger carrying means and adapted to indicate exteriorly of a tube or pipe the position of the plunger within the tube or pipe.

7. An apparatus for eliminating dents from pipes, tubes, and the like, comprising plunger carrying means adapted to be introduced in tubes, pipes, and the like, a plunger in said carrying means, spring means for retracting the plunger, a pump, a conduit connecting the pump and the plunger carrying means, a reservoir for oil or other fluid, a pipe between said reservoir and the first named pipe and provided with a cut off valve, a non-return valve in the first named pipe back of the pipe in connection with the reservoir, said valve arranged to open toward the plunger carrying means, and a pipe between the first named pipe and the non-return valve therein, back of said non-return valve and the pipe between the reservoir and the first named pipe at a point between the reservoir and the cut off valve and having a non-return valve arranged to open in a direction toward the first named pipe, a bar connecting the pump and the plunger carrying means, said bar adapted to enter a tube or pipe, and a second bar connected with the first named bar and equipped with a pointer adapted to operate exteriorly of a tube or pipe to indicate the position of the plunger within the tube or pipe.

8. An apparatus for eliminating dents from pipes, tubes, and the like, comprising plunger carrying means adapted to be introduced in tubes, pipes, and the like, a

plunger in said carrying means, spring means for retracting the plunger, a pump, a conduit connecting the pump and the plunger carrying means, a reservoir for oil or other fluid, a pipe between said reservoir and the first named pipe and provided with a cut off valve, a non-return valve in the first named pipe back of the pipe in connection with the reservoir, said valve arranged to open toward the plunger carrying means, and a pipe between the first named pipe and the non-return valve therein, back of said non-return valve and the pipe between the reservoir and the first named pipe at a point between the reservoir and the cut off valve and having a non-return valve arranged to open in a direction toward the first named pipe, a bar connecting the pump and the plunger carrying means, said bar adapted to enter a tube or pipe, and a second bar connected with the first named bar and equipped with a pointer adapted to operate exteriorly of a tube or pipe to indicate the position of the plunger within the tube or pipe; the said spring means for retracting the plunger including a bolt spring, retractile springs connected with the plunger and the plunger carrying means.

9. An apparatus for eliminating dents from pipes, tubes, and the like, comprising a plunger adapted to be introduced into a tube or pipe to a position opposite the dent to be removed, and means for forcing the plunger outwardly against the said dent, in combination with a pointer connected with the plunger and adapted to operate exteriorly of a tube or pipe to indicate the position of the plunger within the tube or pipe.

In testimony whereof I affix my signature.

LUTHER E. BROWN.