Aug. 31, 1954 B. C. PERKINS 2,687,763

INSERTABLE AND REMOVABLE SHAPE RESTORING PRESS

Filed May 3, 1951

Fig. 1

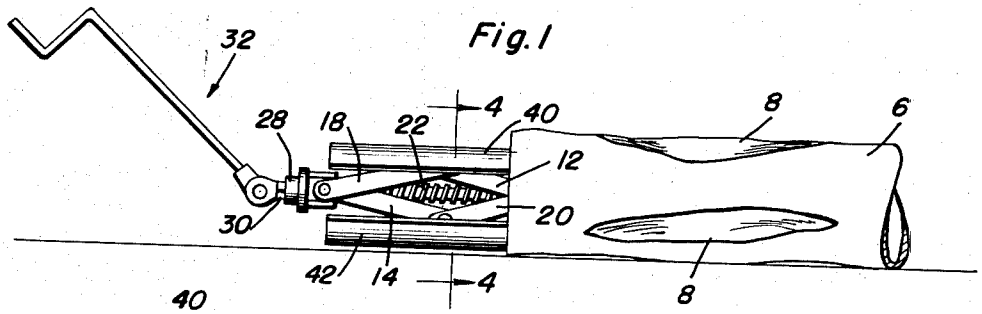


Fig. 2

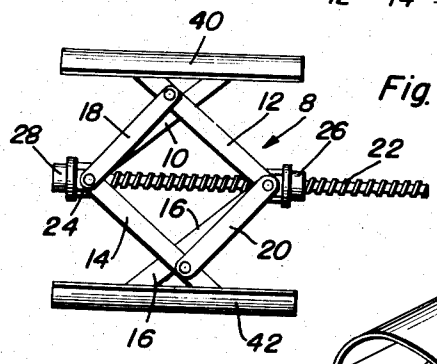


Fig. 3

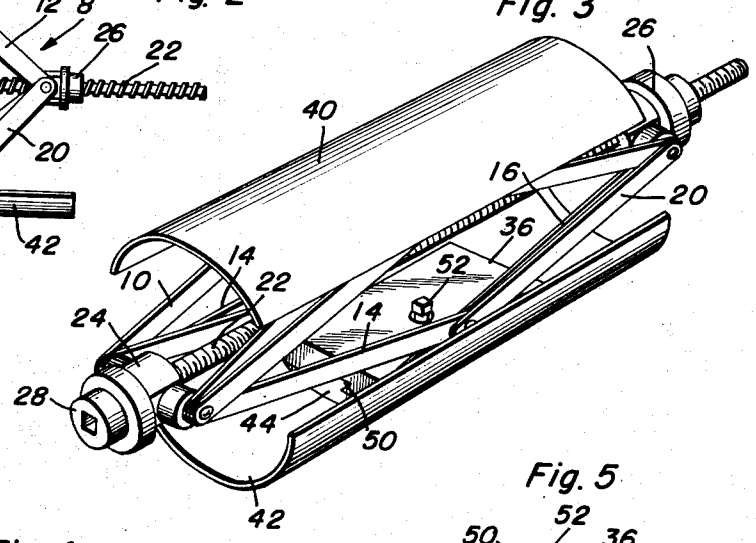


Fig. 4

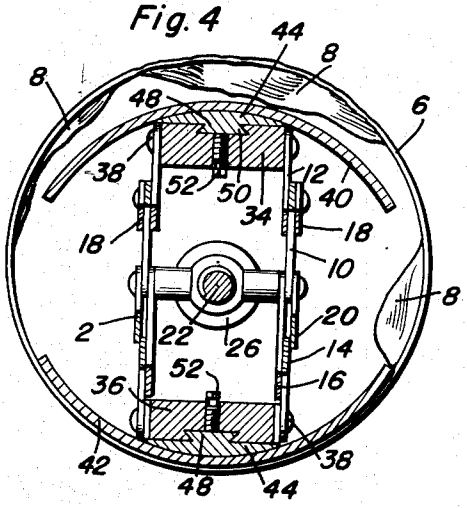
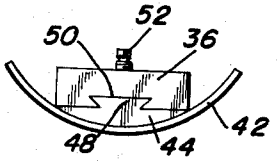


Fig. 5



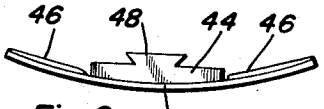


Fig. 6

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INSERTABLE AND REMOVABLE SHAPE RESTORING PRESS

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Application May 3, 1951, Serial No. 224,288

1 Claim. (Cl. 153—53)

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The present invention relates to a novel and a useful invention in the form of a readily insertable and removable internal press, more specifically, a press which is expressly designed and aptly usable for removing distortions and dents from a length of pipe whereby the latter may be restored to its original shape and, in this manner, salvaged for long and continued use.

It is a matter of common knowledge, especially to citrus growers, that irrigation pipe sections are subject to damage and distortion. These pipe sections are, of course, of different lengths and cross-sectional sizes and they may range in sections from ten to twenty foot lengths. It is common in the practices of citrus growers to simply discard damaged pipe sections and, of course, since these sections run two dollars per foot and upwards, thoughtless discarding turns out to be an expensive undertaking. What with materials in the metal fields being under restriction and shortages ahead, ways and means must be found for salvaging satisfactorily usable pipe sections. The present invention, therefore, has to do with a long handled insertable and removable internal-type press which may be fed into one end of a pipe section and moved in a step-by-step manner along from place to place and operated for purposes of removing dents and restoring the pipe section to its original shape and proportions.

Expansible and contractible presses are, of course, not new. In fact, it is not unusual to see an insertable press which is characterized by diametrically opposite convex anvils which are used with a mallet for conveniently pounding, hammering, or otherwise removing dents. The present invention relates to a press which is sufficiently powerful, yet of a light duty character, which generates sufficient force and power to remove the dents merely by exerting equalized pressure from the axial center of the damaged pipe section.

It is a general object of the invention to structurally, functionally and otherwise improve upon prior art restoring presses for damaged casings, pipes and the like. In so doing, the construction evolved and produced constitutes one which is not only simple and efficient but is such that manufacturers, users and others will find their essential requirements and needs fully met, and effectually available therein.

Briefly summarized, the preferred embodiment of the invention is characterized by a jack with a detachable long handle whereby said jack may be slid into the pipe section from either end. The

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jack is preferably a so-called scissors or squeeze-type automobile jack. Special heads are provided and these heads move toward and from each other and are constructed to provide adapters. These adapter heads are employed to accommodate readily attachable and detachable shape restoring forms. The forms have ways and means whereby they may be detachably mounted on the adapter heads on the jack.

Other objects and advantages will become more readily apparent from the following description and the accompanying sheet of illustrative drawings.

In the accompanying sheet of drawings, wherein like numerals are employed to designate like parts throughout the views:

Figure 1 is a side elevational view of an end portion of a dented pipe section in need of repair, showing the shape restoring press partly inserted and ready for operational use;

Figure 2 is an enlarged side elevation of the press showing the forms spread widely apart under the action of the expansible and contractible jack.

Figure 3 is a perspective view on a suitably enlarged scale to bring out the details of construction;

Figure 4 is a cross-section, also enlarged, on the line 4—4 of Figure 1, looking in the direction of the arrows; and

Figures 5 and 6 are detailed views showing certain of the essential details of the over-all construction.

In the drawings the damaged tube or pipe section which is, of course, of bendable stock, is denoted by the numeral 6 and the distortions and dents are denoted at 8. It has been found that by inserting a suitable press telescopically into one end of the pipe and moving it along in a step-by-step manner and expanding the press, the dents may be pressed out and restored to their original shape and proportions. Many and varied styles of presses could be employed. The one herein shown is thought to be aptly suited for the purposes intended. Although some other form of a jack might well be employed as the pressure supplying means, a regular scissors type automobile lifting jack has been found to be best suited for the purposes. This jack is shown in a unitary sense in Figure 2 and it is here denoted, in a general way, by the numeral 8. It embodies pairs of upper crossed links 10 and 12 and pairs of lower crossed links 14 and 16 and stabilizing auxiliary or complemental links 18 and 20. These are assembled and pivoted together in

a well known manner and they are opened and closed under the action of a jack screw 22 which is joined with the links by feed nuts 24 and 26, respectively. The feed nut 24 is provided with a socket member 28 to accommodate a fitting 30 forming a part of an elongate attachable and detachable operating crank or handle 32. Here again, the attachable and detachable handle is a well known component of an automobile lifting jack assembly. It is felt that insofar as the "jack" is concerned, it may be of any suitable construction but is preferably a scissors jack with an attachable and detachable far-reaching handle. In other words, the jack is essential and so is the handle essential in the over-all combination. It is further desirable to use special adapter heads in this jack construction. The heads are in the form of spaced parallel rectangular blocks 34 and 36 as shown in Figure 4. These are joined with the links by pivotal connections as at 38—38. The shape restoring forms are preferably semi-circular rigid plates and these are duplicates of one another and denoted as upper and lower shape restoring forms 40 and 42, respectively (see Figure 4). The concave side of each plate is preferably provided centrally with a coupling block 44 of the type shown in Figure 6. Suitable reinforcing ribs or other elements 46 may be provided. The block 44 has a central dove-tailed shaped keying rib 48 which is fitted removably in a dove-tailed shaped keyway 50 provided in the complemental adapter head 34 or 36 as the case may be. The block member 44 and keys and keying grooves will be standardized so that the parts will be interchangeable. In the citrus fields there are any number of different sizes of pipes used for irrigation. However, one jack with quick, attachable pairs of forms will serve ordinary field requirements. It follows, too, that it is desirable to employ set screws 52 in the adapter heads to facilitate binding the coupling blocks 44 with the adapter heads.

It will be seen that the gist of the invention has to do with diametrically opposite adapter heads 34 and 36, preferably in the form of rectangular blocks which are connected by links and screw means constituting an expanding and contracting jack, preferably one with a readily attachable and detachable long handle. The adapter heads accommodate the readily attachable and detachable forms 40 and 42. These are of different arcuate proportions to accommodate the different sized pipes encountered in field restoration work.

What with the problem understood and the construction of the jack and over-all press understood, it is felt that the reader will understand

that the press is normally contracted as shown in Figure 1, and is shoved endwise into the tube or pipe which is to be repaired. Then the jack is operated and the forms are expanded and the dents or other deformations are straightened out and restored to original shape and proportions.

It is thought that persons skilled in the art to which the invention relates will be able to obtain a clear understanding of the invention after considering the description in connection with the drawings. Therefore, a more lengthy description is regarded as unnecessary.

Minor changes in shape, size and arrangement of details coming within the field of invention claimed may be resorted to in actual practice, if desired.

Having described the invention, what is claimed as new is:

A readily insertable and removable damaged pipe reshaping and restoring device comprising an axially insertable and removable jack screw, nuts operatively mounted on said screw, link means including a plurality of links operatively connected at corresponding inner ends with their respective nuts, oppositely disposed heads movable toward and from each other and carried by the outer ends of the respective links, handle means operatively connected with one of said nuts, each adapter head being in the form of a rigid block having a lengthwise groove opening through its respective transverse ends and providing a keyway, a pair of readily attachable and detachable alongated duplicated arcuate plates, said plates constituting dent removing and shape restoring complemental forms, and a coupling member rigidly secured to the inner concave surface of each plate and contacting and cooperating with the adjacent adapter head, each coupling member having a rib forming a key and said key being keyed removably in the cooperating keyway, and setscrews carried by the respective heads and engaging the adjacent keys of the respective coupling members.

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