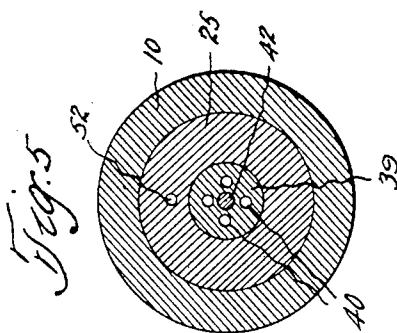
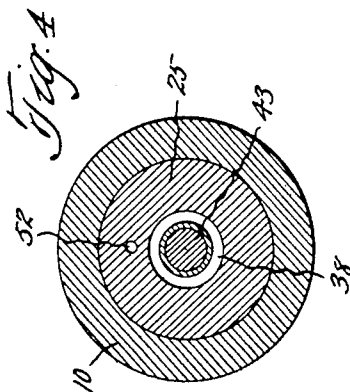
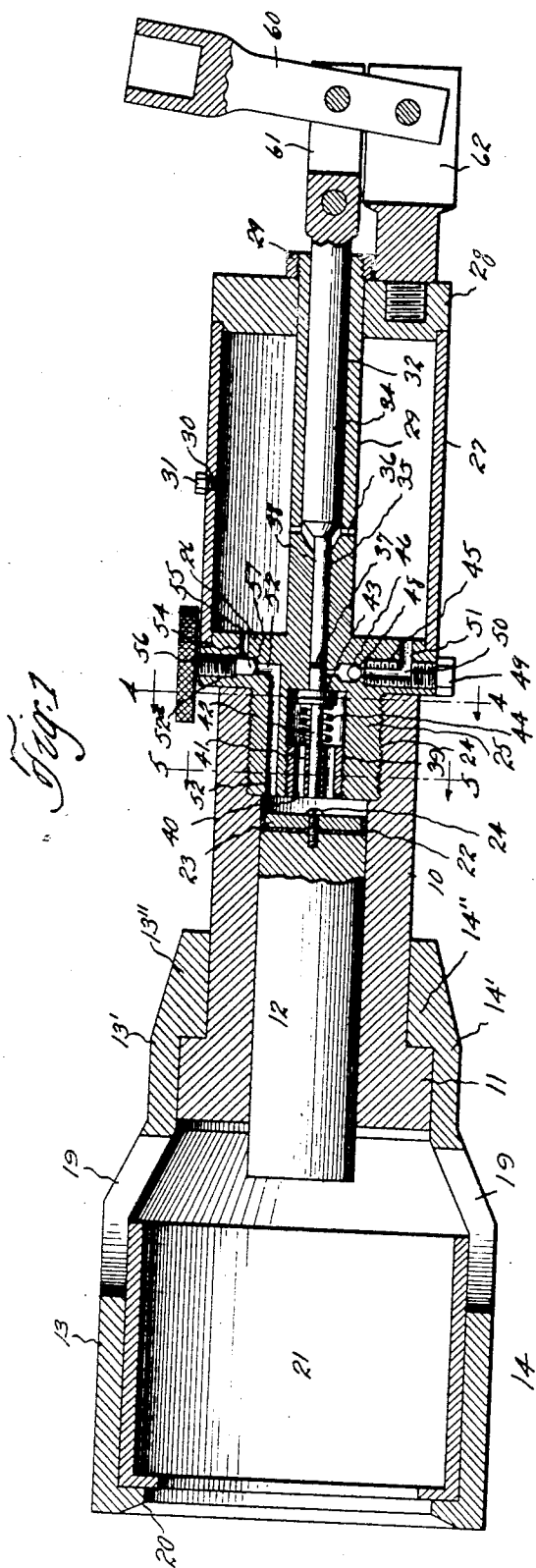


C. W. WOOD AND E. C. KELLY,
HYDRAULIC WHEEL PULLER,
APPLICATION FILED JUNE 4, 1920.

1,387,674.

Patented Aug. 16, 1921.

2 SHEETS—SHEET 1.



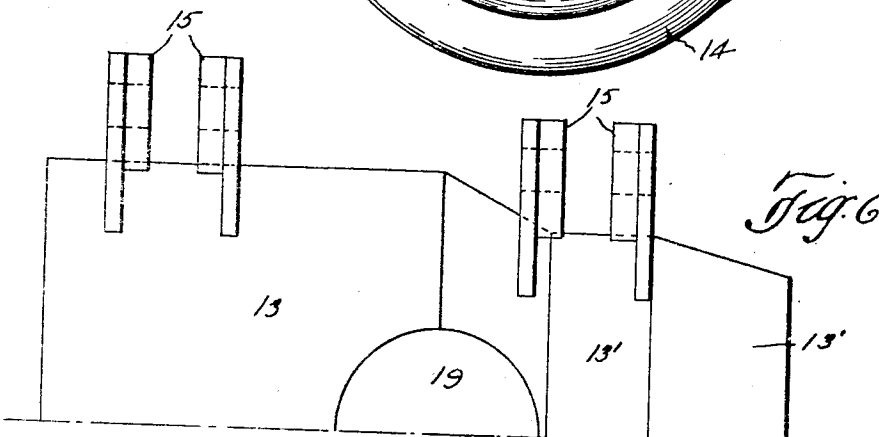
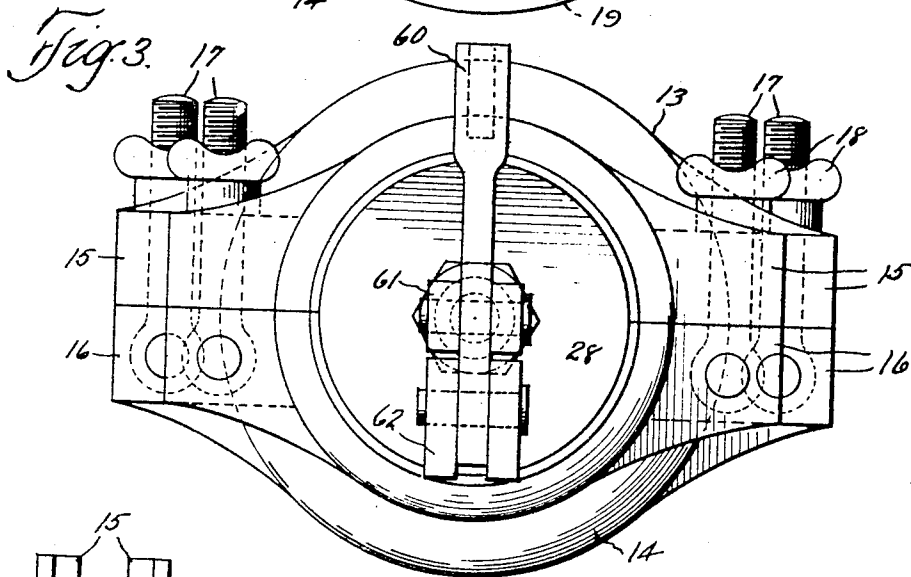
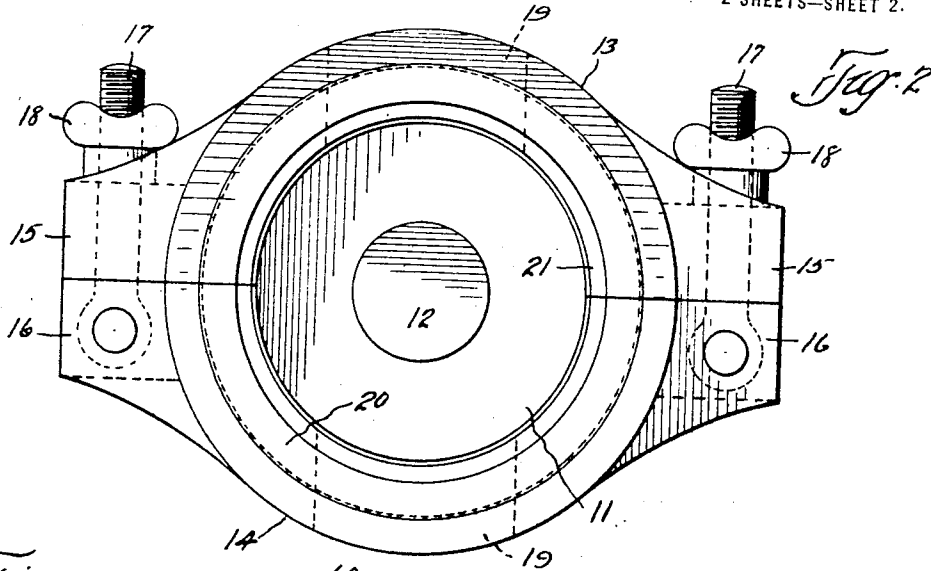
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Inventors
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UNITED STATES PATENT OFFICE.

CHARLES W. WOOD AND EDGAR C. KELLY, OF HAMPTON, VIRGINIA.

HYDRAULIC WHEEL-PULLER.

1.387.674.

Specification of Letters Patent.

Patented Aug. 16, 1921.

Application filed June 4, 1920. Serial No. 386,619.

To all whom it may concern:

Be it known that we, CHARLES W. WOOD and EDGAR C. KELLY, citizens of the United States, residing at Hampton, in the county of Elizabeth City, State of Virginia, have invented certain new and useful Improvements in Hydraulic Wheel-Pullers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to what is commonly known in the art, as wheel pullers and which are employed in removing vehicle wheels from their axles, in removing gears and pinions from their shafts and for similar uses.

It is the object of the present invention to provide a tool that may be readily adjusted for use in connection with objects of various sizes and which in use, will require the exercise of little effort.

It is a further object of the invention to provide a hydraulically operated puller that will be durable and economical of manufacture and which may be readily manipulated to both advance and retract the ram that is forced against the axle or shaft carrying the object to be removed or pulled.

Other objects and advantages of the invention will be apparent from the following description.

In the drawings:

Figure 1 is a section taken centrally and longitudinally through a puller embodying the present invention.

Fig. 2 is a front end view of the puller.

Fig. 3 is a rear end view of the puller.

Fig. 4 is a section on line 4—4 of Fig. 1, looking to the left.

Fig. 5 is a section on line 5—5 of Fig. 1, looking to the left.

Fig. 6 is a plan view of the wheel engaging portion of the puller.

Referring now to the drawings, the present puller comprises a ram casing within which is a hydraulically operated ram which in practice is forced against the end of the axle or shaft, from which the wheel is to be removed. Removably connected with one end of this casing is a pair of wheel engaging jaws while at the other end of the casing, is a reservoir and a pump for forcing liquid to

the head of the ram, thus to project the ram from the casing and thereby draw or pull the wheel.

The ram casing is shown at 10 and has at one end a circumscribing flange 11, and it is from that end that the ram 12 is projected in the operation of the puller.

The wheel engaging jaw members include the semi-cylindrical portions 13 and 14, respectively, which in practice are assembled to form the complete cylinder as illustrated in Fig. 2. These semi-cylindrical jaw members are reduced in diameter at one end as shown at 13' and 14' and are fitted over the annular flange 11 and beyond this annular flange, are provided with inwardly directed or radial flanges 13'' and 14'' that snugly encircle the ram casing just behind its radiating flange 11.

To hold the jaw members 13 and 14 to the ram casing, they are each provided at each side with the longitudinally spaced ears 15 and 16, respectively, disposed in pairs and with each ear of one member opposite to a corresponding ear of the other member. Between each pair of ears 16 is pivoted one end of an eye bolt 17, the pivot of which is engaged through said ears, and which bolt is adapted to swing into and out of position between the corresponding ears 15. The ears 15 have their upper faces flattened for contact by the thumb nut 18 that is engaged with the eye bolt to clamp the jaw members together.

As previously stated, it is from this end of the ram casing 10, that the ram projects and to permit of a view of the end of the ram to facilitate adjustment of it to the work, the jaw members are provided with sight openings 19. The outer ends of the jaw members have inwardly directed flanges that engage behind the wheel to be pulled and to suit different working conditions, bushings 21, similarly flanged, may be disposed within the jaw members, as illustrated in Fig. 1.

With the construction as thus far described, it will be readily understood that when the jaw members are engaged over a wheel and the ram is disposed against the axle or shaft that carries the wheel, the wheel will be pulled, when the ram is projected from the casing.

To project the ram 12 from the casing,

there is provided means for subjecting its inner end to liquid pressure and to prevent leakage past the inner end of the ram, it is provided with a common type of packing disk 22 against which is held a metal disk 23 by means of a screw 24 engaged through them and into the ram.

The outer end of the casing 10 is increased slightly in internal diameter and is internally threaded as shown at 24 and with these threads is engaged the threaded cylindrical stem 25 that projects centrally from one head 26 of a fluid reservoir that includes the cylindrical wall 27 and a second head 28. From the head 26 at the opposite side from the stem 25, there projects centrally a cylindrical pump barrel 29 that extends centrally through the head 28 and is provided at its outer end with a nut 29 that engages against the outer face of the head 28 so that the reservoir wall 27 may be firmly clamped between the heads. A filling opening 30 having a closure 31, is provided for the reservoir.

Within the pump barrel 29 which has a major outer diameter 32 and a minor inner diameter 33, there is slidably disposed a pump plunger comprising corresponding major and minor portions 34 and 35 and leading through the pump barrel at the inner end of its major internal diameter, are vent openings 36 that permit of surging back and forth of liquid from the reservoir in response to reciprocation of the plunger.

It is the minor portion 35 of the plunger that draws liquid from the reservoir and forces it to the inner end of the ram.

The outer end of the minor bore 33 of the pump barrel communicates with an enlarged valve chamber 38 that is formed axially of the stem 25 and opens through the free end of the latter. In the outer end portion of the chamber 38 is screwed a bushing 39 having an annular series of liquid passages 40 extending longitudinally through it and having also a central passage 41. The passage 41 slidably receives the stem 42 of a valve 43 that is held normally against the inner end of the chamber 38 and over the corresponding end of the minor portion 33 of the bore of the pump barrel, by means of a helical spring 44 that bears at one end against the valve head and at its other end against the bushing 39, the spring encircling the valve stem as illustrated.

Formed radially through the reservoir head 26 is a passage which at its outer end portion is of major diameter and is internally threaded, as shown at 45. Communicating with the portion of major diameter 45, is a valve chamber 46 of reduced diameter and with this portion 46 of the passage, there communicates the further reduced portion 47, there being a valve seat 48 at the inner end of a screw plug 49 that is screwed into the portion 45 of the passage and which

has a duct 50 extending from the valve seat axially of the plug for a part of its length and thence through the side of the plug, where it communicates with a port 51 leading through the reservoir head 26 into the reservoir.

With this construction, it will be understood that as the plunger is reciprocated, oil or other liquid supplied to the reservoir, will be drawn through the port 51, the duct 50, the valve chamber 46 and the minor passage portion 47, into the minor bore of the pump barrel and forced thence past the valve, through the valve chamber 38 and the passages 40 to the ram. Thus the ram will be actuated with the so called hydraulic action and with the well known advantageous results.

To vent the ram casing and permit return of the ram thereto, a venting duct or passage 52 extends from the outer end of the stem 25 of the reservoir head, to a point within the head and thence radially of the head as shown at 52' where it is enlarged as shown at 52'' with a resultant shoulder 53 and is then again enlarged as shown at 52^a and threaded, this threaded portion extending through the periphery of the head. From the portion 54 of the passage there extends a port 55 that opens inwardly of the reservoir. A hand screw 56 is engaged in the threaded portion 52^a of the passage and has its inner end portion reduced in diameter while its inner end face is conical as shown at 57 to snugly engage the valve seat 53, this hand screw constituting a cut off valve for the vent passage. It will, of course, be understood that when the hand screw is backed up, liquid may flow from the ram casing back to the reservoir as the ram is pressed into the casing.

To reciprocate the pump plunger, a lever 60 is connected with its outer end by means of the pivoted links 61, the lever being fulcrumed in the slot of a lug 62 that is screwed into the reservoir head 28, in the structure illustrated, but it will be understood that reciprocation of the plunger may be effected in any desired manner.

What is claimed is:

1. A wheel puller comprising a casing having a wheel engaging member at one end and a reservoir at its other end, a ram slidably mounted in the casing for projection therefrom in wheel pulling active relation to the wheel engaging member, a pump within and communicating with the reservoir and ram chamber of the casing in position to force liquid under pressure against the ram, and a manually controlled vent from the casing at the head of the ram to the reservoir.

2. A wheel puller comprising a casing having a wheel engaging member, a ram slidably mounted in the casing for projection

tion therefrom in wheel pulling active relation to the wheel engaging member, a reservoir at the other end of the casing from the ram, a pump comprising a barrel within the casing alined with the ram, the pump having communication with the reservoir and with the casing at the head of the ram to force liquid under pressure against the latter, a vent between the casing at the head of the ram and the reservoir, and means for controlling the vent.

3. A wheel puller comprising a casing having a wheel engaging member at one end and a ram slidably mounted in the casing for projection therefrom in wheel pulling active relation to the wheel engaging member, a reservoir at the other end of the casing in axial alinement with the ram, a pump comprising a barrel arranged within the reservoir in axial alinement with the ram, a plunger for the barrel, a pump lever fulcrumed upon the end of the reservoir and connected with the plunger, the pump having communication with the casing at the inner end of the ram to deliver liquid under pressure thereagainst, a vent between the casing at the head of the ram and the reservoir, and means for controlling the vent.

4. A wheel puller comprising a casing, a wheel engaging member at one end of the casing, a ram slidably mounted in the casing for projection therefrom in wheel pulling active relation to the wheel engaging member, a reservoir at the other end of the casing and a pump within the reservoir and communicating with the reservoir and with the inner end portion of the inclosure of the

casing for forcing liquid under pressure against the ram.

5. A wheel puller comprising a casing, a wheel engaging member at one end of the casing, a ram slidably mounted in the casing for projection therefrom in wheel pulling active relation to the wheel engaging member, a reservoir having a stem projecting from one end and engaged in the other end of the casing, and a pump carried by the reservoir and communicating therewith and through said stem with the inclosure of the casing and the inner end of the ram, to force liquid under pressure thereagainst.

6. A wheel puller comprising a casing, a wheel engaging member at one end of the casing, a ram slidably mounted in the casing for projection therefrom in wheel pulling active relation to the wheel engaging member, a reservoir comprising spaced heads and an intervening wall, one of the heads having at its outer face a stem engaged in the other end of the casing and having projecting from its other face a pump barrel extending through the other head, a pump plunger in the barrel having means for reciprocating it, a pump barrel having valved communication with the reservoir and with the casing at the inner end of the ram, and means for venting the casing to the reservoir.

In testimony whereof we affix our signatures in the presence of two witnesses.

CHARLES W. WOOD.
EDGAR C. KELLY.

Witnesses:

W. F. COLLINS,
F. J. FLYNN.