

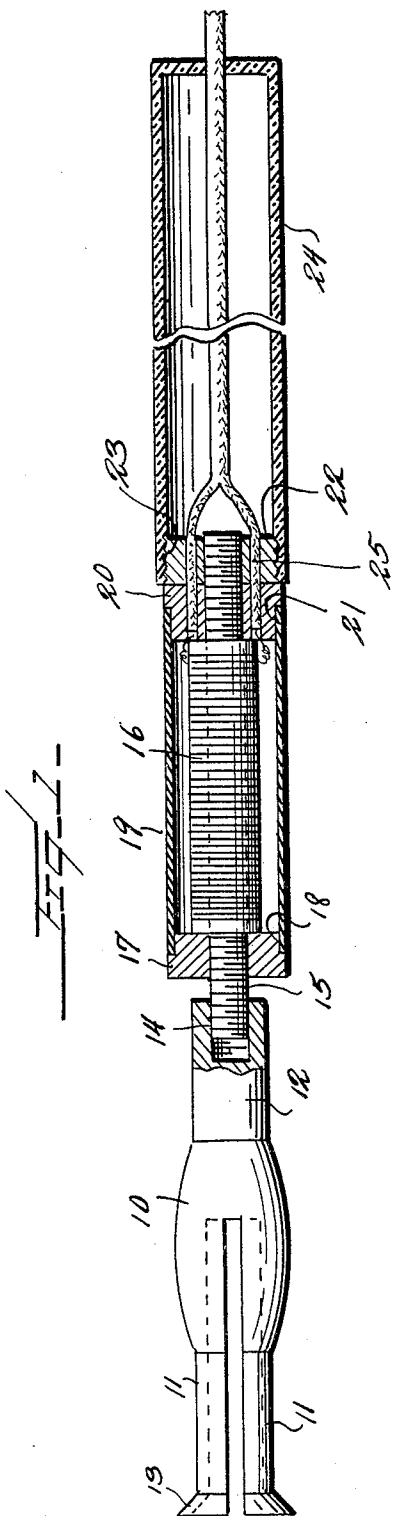
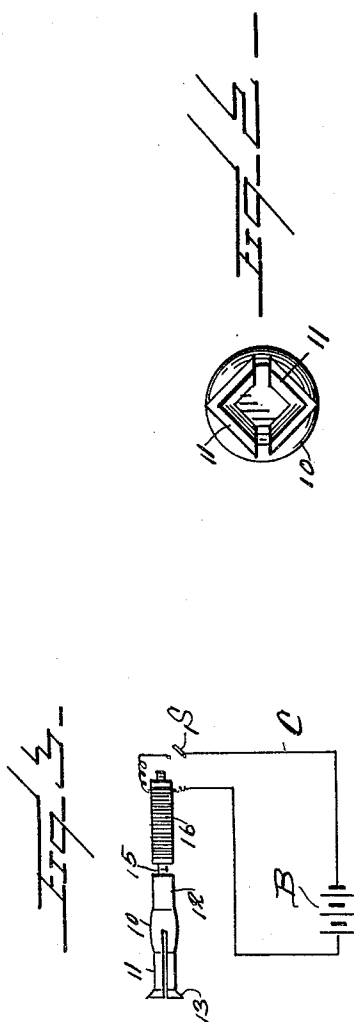
May 16, 1933.

J. L. EARL

1,908,829

BROKEN AXLE PULLER

Filed Feb. 27, 1932



Inventor

J. L. Earl

By

Watson & Coleman
Attorney

UNITED STATES PATENT OFFICE

JOHN LOUIS EARL, OF SAN ANTONIO, TEXAS, ASSIGNOR OF ONE-FOURTH TO EDWIN
FEST, OF SAN ANTONIO, TEXAS

BROKEN AXLE PULLER

Application filed February 27, 1932. Serial No. 595,601.

This invention relates to axle or shaft pulling means.

An object of this invention is to provide a novel puller which may be extended into an axle or shaft housing so as to withdraw a broken shaft mounted within the housing.

Another object of this invention is to provide in a puller of this kind mechanical means which is adapted to be used for pulling or withdrawing the shaft from a bearing or housing where it is impossible to dispose a clamp or other pulling means about the periphery of the shaft.

The above and various other objects and advantages of this invention will in part be described in and in part be understood from the following detailed description of the present preferred embodiment, the same being illustrated in the accompanying drawing, wherein:—

Figure 1 is a longitudinal section partly in detail and partly broken away of a shaft puller constructed according to the preferred embodiment of this invention;

Figure 2 is a detail end elevation of the shaft clamping means;

Figure 3 is a diagrammatic view showing the puller in an electric circuit.

Referring to the drawing wherein like numerals of reference designate corresponding parts throughout the several views, the numeral 10 designates generally a clamping member which is provided at the outer end thereof with a pair of opposed V-shaped shaft engaging members 11 terminating in a flared end portion 13. These shaft engaging members 11 are spaced apart and are adapted to have movement relative to each other so that shafts of various sizes within the limits of the puller can be frictionally or resiliently clamped between the clamping jaws 11.

The inner end of the puller or clamping member 10 is provided with a shank 12 having a threaded bore 14 which is adapted to threadably receive an armature 15. This armature 15 has a solenoid or coil 16 disposed thereabout, and the armature 15 is provided adjacent the outer end thereof with a nut or collar 17 having a shoulder 18 to receive

a sleeve 19 of substantially cylindrical construction.

The opposite or upper end of the armature 15 is also threaded, and a nut 20 is threadably mounted thereon and is also provided with a shoulder 21 to engage the upper end of the sleeve 19 and hold the sleeve 19 concentrically about the coil or solenoid 16. In this manner, the windings of the coil will be suitably protected during the use of the puller. A lock nut 22 preferably engages about the upper end of the armature 15 and locks the nut 20 against movement. This nut 22 is provided with peripheral threads 23 and an elongated hollow handle 24 is threadably mounted on the nut 22.

The ends of the wire of the coil 16 are projected through the nut 20, as at 25, and are also extended through the nut 22 and connected to a suitable source of current supply which, in the present instance, as shown in Figure 3, is designated as a battery B, but I, of course, do not wish to be limited to a battery, as any suitable source of current supply can be used. A switch S is interposed in the electric circuit C to which the coil 16 is connected.

In the use of this device, the clamping member 10 may be projected into an axle housing and if the end of the shaft which is broken extends outwardly of the bearing in the housing, the clamping member 10 can be slipped about the periphery of the shaft, and the tension of the clamping member 11 will be sufficient to withdraw the shaft from the housing. If desired, however, the switch S can be closed, thereby magnetizing the clamp 10 which, in the present instance, constitutes an extension of the armature 15. In this manner, an additional frictional means is provided coacting with the inherent resiliency of the clamping arms 11 in gripping the shaft which it is desired to withdraw from the housing.

In the event the end of the shaft does not project beyond the outer edge of the bearing within which the shaft is mounted, the clamping member 10 may be removed from the armature 15 and the armature 15 projected into the housing so that it will contact with the end of the shaft. The switch S can

then be closed and the magnetism generated by the coil 16 will hold the armature 15 into engagement with the end of the shaft and permit the pulling of the shaft outwardly of the bearing.

It will, therefore, be seen that the shaft puller herein disclosed is readily adapted for use in the pulling of shafts which can be engaged by the clamp 10 or shafts which are broken off to a point where a gripping means cannot engage about the periphery thereof. This handle 24 can be made of any suitable length so that the puller can be projected into any desired axle housing and in like manner, various sizes of clamping members 10 may be mounted on the armature 15.

It is, of course, understood that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

What is claimed is:—

1. A broken axle puller as set forth comprising a clamp having V-shaped complementary arms adapted to frictionally engage about the surface of a shaft, a handle secured to the clamp and extending longitudinally thereof and means carried by the handle for magnetizing the arms.

2. An axle pulling means as set forth comprising in combination, an electric circuit, a coil in said circuit, an armature for the coil, a handle, means for securing the handle to the armature in alinement therewith and opposed resilient clamps carried by the armature.

3. An axle pulling means as set forth comprising a clamp, a handle, a magnetic means interposed between the handle and the clamp to energize the clamp, and means for connecting the magnet to a source of current supply.

4. An axle pulling means as set forth comprising an axle gripper, a handle, an armature threadably engaging the gripper and the handle, and a coil disposed about the armature to energize said armature and said gripper.

5. An axle pulling means as set forth comprising an armature, a coil about the armature, a handle, means for securing the handle to the armature, an electric circuit within which said coil is interposed, a shield disposed about the coil and resilient axle clamps carried by the armature for magnetization thereby.

6. An axle pulling means as set forth comprising an armature, a handle threadably secured to one end of the armature, a coil disposed about the armature intermediate the ends thereof, a protecting shield disposed about the coil, and resilient axle clamps car-

ried by the armature for magnetization thereby.

7. An axle pulling means as set forth comprising an armature, a coil about the armature, threaded collars carried by the armature and engaging against end of the coil, a shield engaging the collars and disposed about the coil, a handle secured to one end of the armature and extending longitudinally thereof and clamps carried by the other end of the armature.

8. An axle pulling means as set forth comprising an elongated armature, a coil disposed about the armature and terminating inwardly of each end thereof, a shield, means engaging the armature and the shield to hold the shield concentrically about the armature, a handle secured to one end of the armature, and axle clamping means carried by the other end of the armature for engagement with a shaft.

9. A broken axle pulling means comprising an armature, a coil disposed about the armature, said armature having threaded opposite end portions projecting beyond the ends of the coil, a handle secured to one end of the armature, and an axle gripping means secured to the opposite end of the armature and extending longitudinally thereof, said axle gripping means being energized upon energization of the armature.

10. A broken axle puller comprising a clamp, a coil adapted to be interposed in an electric circuit, a core, and means for connecting the core to the clamp to magnetize the clamp upon magnetization of the core.

In testimony whereof I hereunto affix my signature.

JOHN LOUIS EARL.