

A. J. HUNTER.
PINION PULLING MECHANISM.
APPLICATION FILED JAN. 19, 1909.

1,045,146.

Patented Nov. 26, 1912.

2 SHEETS-SHEET 1.

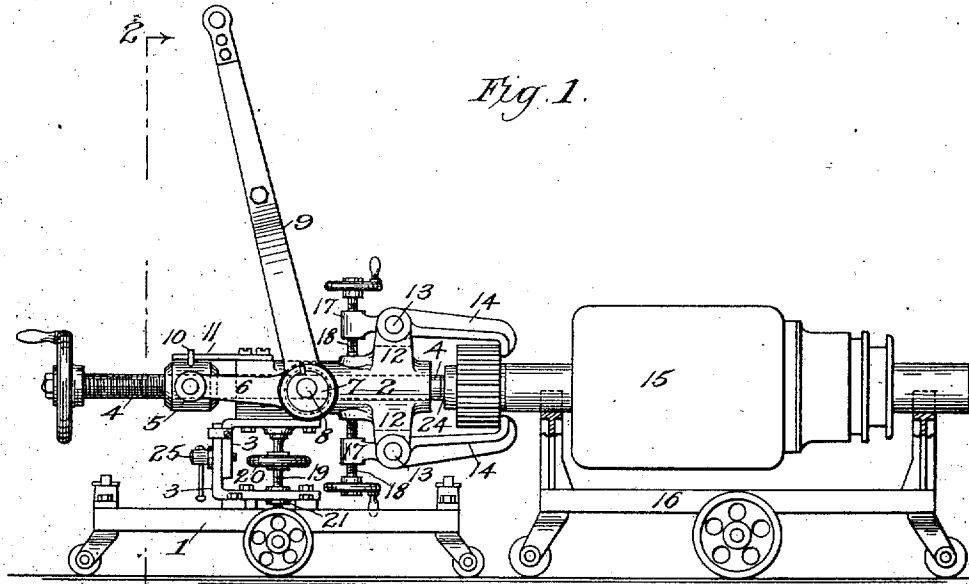
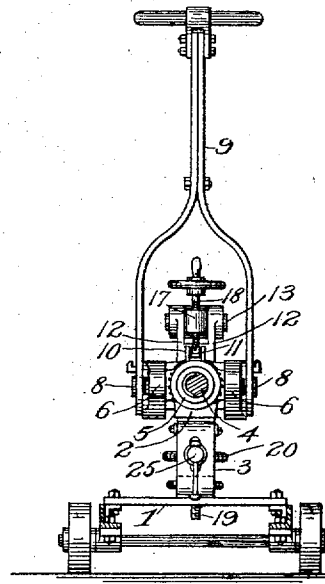


Fig. 2.



Witnesses:
John Travers
W. S. Kennedy

Inventor:
Alfred J. Hunter
By his Attys:
Philip S. Sawyer, Ross & Kennedy

A. J. HUNTER.
PINION PULLING MECHANISM.
APPLICATION FILED JAN. 19, 1909.

1,045,146.

Patented Nov. 26, 1912.

2 SHEETS-SHEET 2.

Fig. 3.

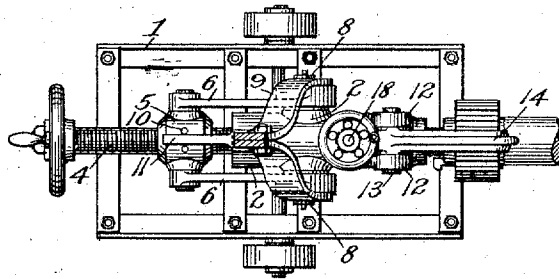


Fig. 4.

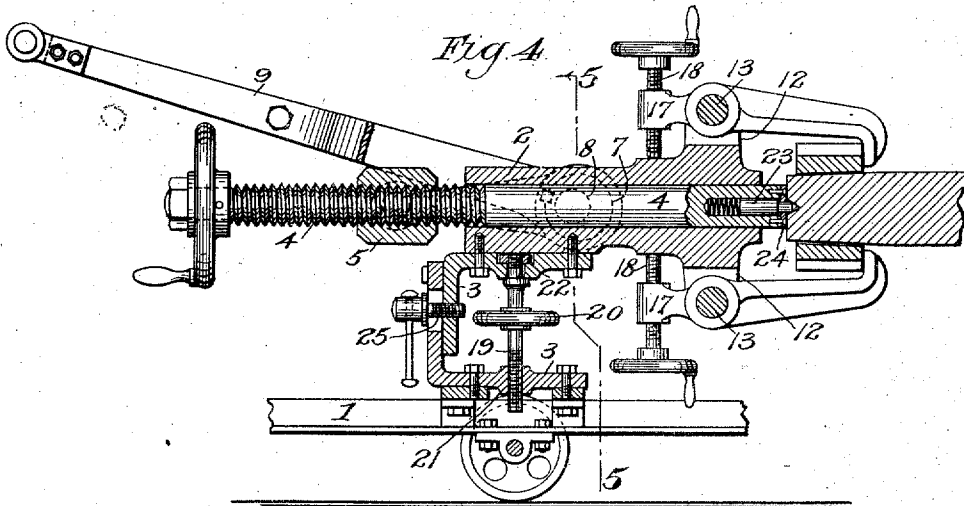
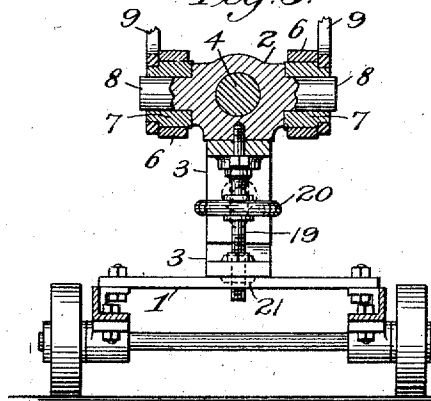


Fig. 5.



Witnesses:
J. A. Graves
W. S. Kennedy

Inventor
Alfred J. Hunter

by his Attys:
Philip Sawyer Rice Kennedy

UNITED STATES PATENT OFFICE.

ALFRED J. HUNTER, OF BAYONNE, NEW JERSEY, ASSIGNOR TO GEORGE E. AUSTIN, OF
BROOKLYN, NEW YORK.

PINION-PULLING MECHANISM.

1,045,146.

Specification of Letters Patent.

Patented Nov. 26, 1912.

Application filed January 19, 1909. Serial No. 473,097.

To all whom it may concern:

Be it known that I, ALFRED J. HUNTER, a citizen of the United States, residing at Bayonne, county of Hudson, and State of New Jersey, have invented certain new and useful Improvements in Pinion-Pulling Mechanism, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to mechanism for removing pinions, pulleys, sleeves, and the like from shafts or the like with which they have a driving or driven connection.

It is the object of the present invention to provide mechanism which will quickly and easily remove the pinions or the like without any danger of breakage or other injury thereto or the shaft or the like on which they may be mounted, and it is a further object of the invention to provide mechanism of this character so mounted as to be readily portable so that it may be conveniently and quickly moved from one place of use to another.

As a full understanding of the improvements of the present invention can best be had from a detailed description of an organization embodying the same, such description will now be given in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of a pinion removing mechanism embodying the improvements of the present invention, the same being shown as in position to remove a pinion from the shaft of an armature. Fig. 2 is a section on the line 2 of Fig. 1, omitting the armature and carriage therefor shown in Fig. 1. Fig. 3 is a plan view of the pinion removing mechanism, the pinion and a portion of the shaft of the armature of Fig. 1 being also shown. Fig. 4 is a vertical longitudinal section of Fig. 3, but on an enlarged scale; and Fig. 5 is a vertical section on the line 5 of Fig. 4.

Referring to said drawings, 1 is a carriage upon which is supported a sleeve 2, by means of a vertically adjustable two-part bracket 3, this sleeve 2 constituting, with other parts hereinafter described, what may be termed the pinion engaging and pulling member of the apparatus. Mounted in the sleeve 2 is a rod 4 threaded at its outer end,

and provided with a hand wheel for rotating it, this rod constituting the shaft engaging and pushing member of the apparatus, acting in opposition to the pulling member 2. The threaded portion of said rod is engaged by a nut 5 to which is pivoted one end of each of a pair of arms 6, the other end of each of said arms 6 forming a strap receiving an eccentric 7 surrounding a stud 8 secured to the sleeve 2. This nut with the other parts referred to constitutes one of the driving means whereby the relative pushing and pulling movements of the two members 2, 4, is effected, on rotation of rod 4. Other driving means, which will now be described, are also provided for effecting such movements independently of rotation of rod 4. Keyed to the eccentric 7 is a lever 9, which when thrown down, as shown in Fig. 4, rotates the eccentrics 7 to move the nut 5 inwardly in a longitudinal direction and relatively to member 2 by means of the arms 6. This movement of the nut 5 also moves the bar or rod 4 in the same direction, the threads of the nut and rod 4 forming a lock to accomplish this. The nut 5 is held from rotation as the rod 4 is rotated, by pins 10 secured to the nut embracing a finger 11 secured to the sleeve 2, the finger 11 sliding between the pins 10 as the bar 4 and nut 5 are moved longitudinally. The sleeve 2 is provided with two lugs or ears 12 to which are pivoted, at 13, arms 14 bent downwardly at their outer end to provide hooks adapted to take over and grasp a pinion mounted on and secured to the shaft, for example, of an armature 15, which, for the removal of the pinion 5 is carried in a truck or carriage 16.

The hooked ends of arms 14 are, as will be observed, diametrically opposite so as to engage the pinion 5 at diametrically opposite points and thus pull upon the pinion in lines parallel to the latter's axis. All liability of canting or tilting of the pinion under the pull of arms 14 and possible injury to it or its shaft resulting therefrom, is avoided. The inner ends of the arms 14 are provided with a hub 17 screw threaded to be engaged by adjusting screws 18 provided with suitable hand wheels, the ends of the said screws bearing against the surface of the sleeve 2. By this means it will be seen that the outer ends of the arms 14 can be raised or lowered

so as to embrace pinions or pulleys of different diameters. The sleeve 2, and with it, of course, the rod 4 and parts carried by said sleeve and rod, is adjustable sidewise or vertically on carriage 1 by means of a threaded rod 19 to which is rigidly fixed a suitable hand wheel 20, and which engages a threaded boss 21 formed on the lower portion of the bracket 3; the purpose of this sidewise adjustment being to raise or lower the sleeve 2 and rod 4 and parts carried by them into alinement with the axes of the shaft and pinion on which they are to operate. The upper portion of the bracket 3 is bolted to the sleeve 2, and the two parts of the bracket are clamped together by a bolt 25 threaded into the upper part of the bracket and provided with a clamping projection bearing against the outer face of the lower portion of the bracket which latter is slotted so as to allow of a vertical movement of the upper part of the bracket and sleeve 2 for the adjustment just referred to when bolt 25 is loosened. The upper part of the threaded rod 19 is provided with a nut 22 seated in a correspondingly shaped recess in upper bracket 3 to prevent vertical movement of the rod 19 when turned by the handle. The inner end of the rod 4 is provided with a perforation in which is mounted a spring pressed plunger 23, which is held therein by a hardened steel plate 24, said plunger having a conical shaped outer end which engages the usual conical recess in the end of the shaft, for example, of an armature.

The operation is as follows: The pinion pulling device may, by reason of its mounting in carriage 1, be moved up to the shaft and pinion to be operated on, or the latter may, as shown, be moved up to the former, the pinion and shaft being mounted temporarily in a suitable carrier as 16. The two being thus brought together, carriage 1 will be moved forward until the arms 14 are in a position to engage the inner side of the pinion 5, their hooked ends being moved down into such position by the turning of screws 18. The threaded bar 4 is then turned by its hand wheel until its inner end abuts against the end of the shaft of the armature. The lever 9 is then thrown down, when the arms 6 will be moved inwardly by the eccentric 7, the result of this being to force the shaft of the armature away from the sleeve 2, and away from the pinion, which is, of course, held in its original position by means of the arms 14. If this one movement is not sufficient to loosen the pinion from the shaft sufficiently for its removal therefrom by hand or by turning rod 4 by hand to move nut 5 and sleeve 2, with the latter's arms 14, rearwardly along said rod 4, the rod 4 is rotated again by the hand wheel until its inner end abuts against the shaft of the armature,

and the operation as just stated is repeated. When the pinion is thus loosened it may be slipped off the shaft by hand or, as just indicated, by manually turning rod 4. Should the axes of the shaft and pinion to be operated upon, either when mounted on truck 16 or in the machine to which they belong, be out of alinement horizontally with the rod 4, the latter and member 2 may be adjusted sidewise or vertically as heretofore described to bring them into alinement with the axes of the shaft and pinion.

What is claimed is:—

1. In a machine for pulling pinions or the like from shafts or the like, the combination of two endwise relatively movable members, one for pushing against the end of the shaft or the like and the other for pulling upon the pinion or the like, connections between the two members whereby such movement is effected, and a manually operable lever and eccentric on the pulling member and operating on the pushing member for also effecting such movement, substantially as described.

2. In a machine for pulling pinions or the like from shafts or the like, the combination of two endwise relatively movable members, one of which is rotary and for pushing against the end of the shaft or the like and the other for pulling upon the pinion or the like, a screw threaded connection between the two members by which such relative movement is effected on rotation of the pushing member and additional means, including an eccentric and a manually operable lever for actuating it, for also effecting such movement, substantially as described.

3. In a machine for pulling pinions or the like from shafts or the like, the combination of two endwise relatively movable members, one of which is rotary and for pushing against the end of the shaft or the like and the other for pulling upon the pinion or the like, connections between the two members by which such relative movement is effected on rotation of the pushing member comprising a nut threaded to the latter and having a link connection with the pulling member, and a manually operable lever and eccentric mounted on the latter and connected with said linked connection for effecting such movement independently of rotation of the pushing member, substantially as described.

4. In a machine for pulling pinions or the like from shafts or the like, the combination of two endwise relatively movable members, one for pushing against the end of the shaft or the like and the other for pulling upon the pinion or the like, a two-part support for said two members comprising a part in which said members are mounted and which is adjustable relatively to the other part to adjust said members bodily

sidewise into alinement with the axes of the shaft or the like and pinion or the like to be operated upon, and means whereby the relative movement of the two members is effected, substantially as described.

5 5. In a machine for pulling pinions or the like from shafts or the like, the combination of two endwise relatively movable members, one for pushing against the end of the
10 shaft or the like and the other for pulling upon the pinion or the like, a portable carrier for said two members provided with a two-part support for said members comprising a part in which said members are
15 mounted and which is adjustable relatively to the other part to adjust said members bodily sidewise into alinement with the axes of the shaft or the like and pinion or the like to be operated upon, and means whereby

the relative movement of the two members is effected, substantially as described.

6. In a machine for pulling pinions or the like from shafts or the like, the combination of pushing member 4, pulling member 2, provided with pinion grasping arms 14 and
25 means for adjusting the latter, threaded nut 5, driving connections between it and the members 2, 4, manually operable lever 9 and eccentrics 7 mounted in member 2, and arms
30 6 connecting said eccentrics and nut 5, substantially as described.

In testimony whereof, I have hereunto set my hand, in the presence of two subscribing witnesses.

ALFRED J. HUNTER.

Witnesses:

J. A. GRAVES,
A. WHITE.