No. 864,370. PATENTED AUG. 27, 1907.

F. GRILL.

ROUGHENING TOOL FOR BELT PULLEYS.

APPLICATION FILED DEC. 20, 1906.

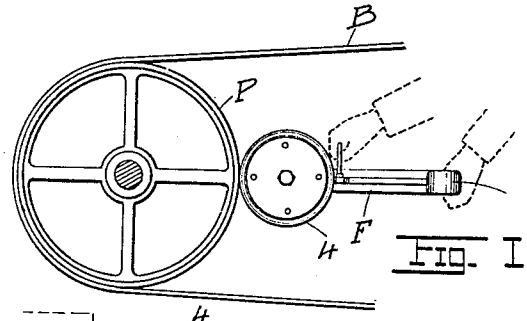


Fig. 1.

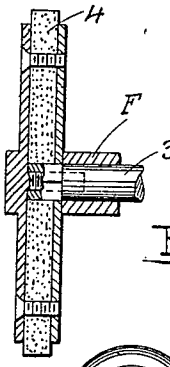


Fig. 7.

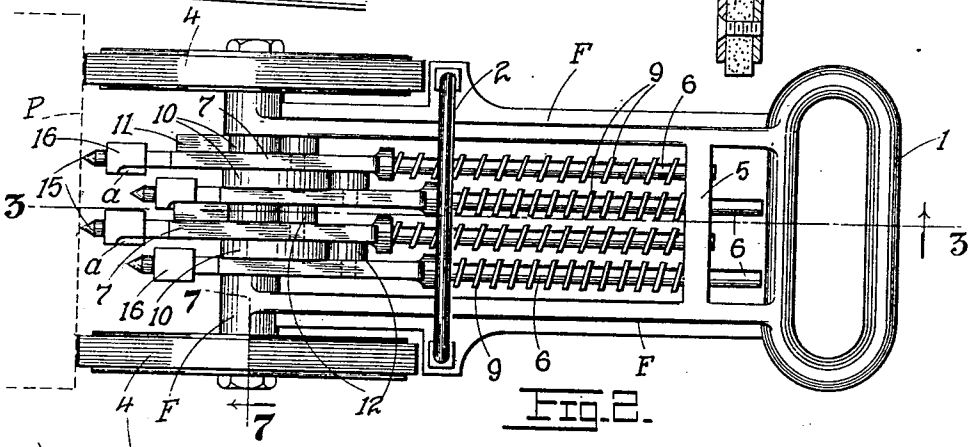


Fig. 2.

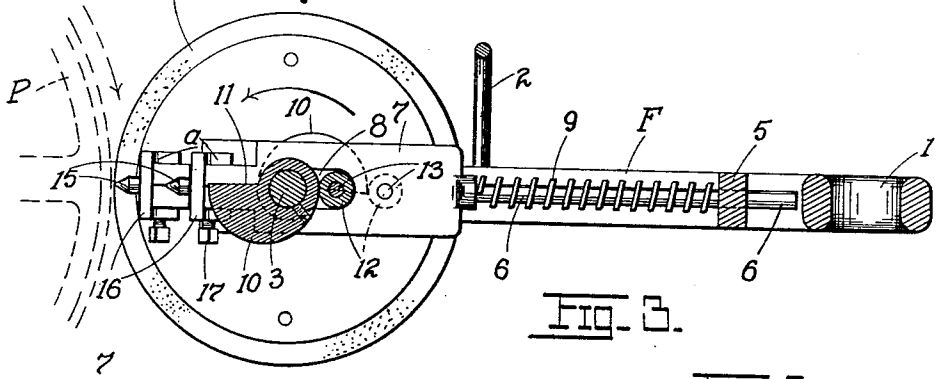


Fig. 3.

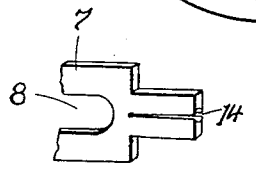
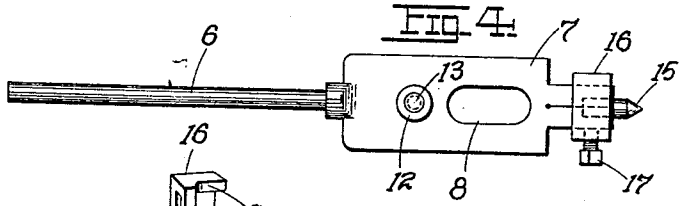


Fig. 5.

Fig. 4.



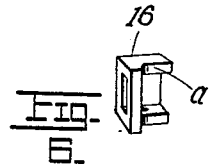


Fig. 6.

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ROUGHENING-TOOL FOR BELT-PULLEYS.

No. 864,370. Specification of Letters Patent. Patented Aug. 27, 1907.

Application filed December 20, 1906. Serial No. 348,742.

To all whom it may concern:

Be it known that I, FRANK GRILL, a citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Roughening-Tools for Belt-Pulleys, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in tools for roughening belt-pulleys; and it consists in the novel construction of tool more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is a side elevation of a pulley showing my invention applied thereto; Fig. 2 is a top plan of the tool on a large scale; Fig. 3 is a longitudinal vertical section on line 3—3 of Fig. 2; Fig. 4 is a side elevation of one of the stems or plungers; Fig. 5 is a perspective of the outer split end of the plunger-head showing socket for the reception of the tool-bit; Fig. 6 is a perspective of the clamping block by which the parts on opposite sides of the split are drawn together; and Fig. 7 is a sectional detail on line 7—7 of Fig. 2 showing manner of securing the leather friction-disk to the shaft of the tool.

The object of my invention is to provide a tool which may be applied to the flange or rim of a pulley while in motion, whereby there is set into operation a series of plungers which are caused to impinge against the surface of said flange and impart to said surface the necessary roughening to prevent the slipping of the belt.

I am aware that pulley rims or flanges have been provided with roughened surfaces such as grooves, punctures, holes, indentations and the like for insuring a tight grip on the drive-belt, but these formations are generally made before the pulley is placed in position on the shaft. Ordinarily a new pulley is sufficiently rough to prevent the belt from slipping, but in time it becomes worn smooth so that the belt will lose its grip no matter how much the same may be tightened.

My present invention enables me to roughen the pulley while the same is in actual service, without the necessity of stopping the machinery. In detail the invention may be described as follows:

Referring to the drawings, F, represents a frame terminating at its rear end in a loop or handle portion 1, and having an intermediate handle 2 encompassing the frame from above. The front end of the frame has mounted thereon a rotatable shaft 3 terminating outside the frame, in leather or equivalent friction disks 4 which may be secured to the shaft in any mechanical manner. Supported at one end within a cross-bar 5 of the frame are a series of stems or plungers 6, their opposite ends terminating in enlarged heads 7 provided with longitudinal slots 8 through which the shaft 3 is free to pass, the slots permitting the necessary reciprocation which is imparted to the plungers as subsequently to be seen. Encompassing each stem or plunger is a spring 9 whose one end bears against the bar 5 and the opposite end against the adjacent end of the head or enlarged portion 7, the springs tending to force the plungers outwardly. Disposed on the shaft 3 between the plungers, and between the last plunger and the frame are a series of cams 10, each cam having a radial straight edge 11 by which it is bounded on one side. The cam surfaces ride over the rollers 12 mounted on the studs 13 projecting from the bases of the side faces of the respective heads 7. With the rotation of the shaft 3 the cams will force the respective plungers inwardly, until the rollers slip off the cams and over the edge 11, when the springs will drive them outwardly until again forced inwardly by the action of the cams.

The outer or forward ends of the heads 7 are split forming thus a socket 14 for the reception of a bit 15, the latter being clamped in position by a block 16 passed over the split ends, thereby drawing the split portions together, when the block is finally secured by the clamping screw 17. As the bits become worn, they may be removed, sharpened and tempered and then replaced.

By pressing the disks 4 against the periphery of a rotating pulley P which has been worn smooth in service, said disks and their shaft 3 will at once have imparted to them a rapid rotation. The rotation of the shaft will be communicated to the cams which will rapidly drive the plungers inwardly, the springs 9 (after the rollers 12 have passed off the cams) returning them back to their outer positions. In such outer movement the tips of the tools or bits will indent the peripheral surface of the pulley and roughen the same to prevent the belt B from slipping. The cams may of course be set to operate the plungers in alternate series, or in pairs, or in fact any order whatever, the rapid reciprocation of the bits or tools indenting the surface of the pulley for the purpose here intended. The clamping blocks have a section removed at *a*, to allow for the free rotation of the adjacent cam as seen in Figs. 2 and 6.

The device may of course be qualified in many minor particulars as obvious to any skilled mechanic.

Having described my invention, what I claim is:

1. In a pulley roughener, a suitable frame, a rotatable disk carried thereby adapted to engage the periphery of the pulley and have rotation imparted thereto with the rotation of the pulley, and a series of reciprocating devices for impinging against and roughening the periphery of the pulley during such rotation.

2. In a pulley roughener, a suitable frame, a rotatable disk carried thereby, a shaft connecting the disks, a series of cams on the shaft, spring-controlled plungers actuated in one direction by the cams, and bits on the outer ends of the plungers for impinging against the periphery of a rotating pulley upon the engagement of the disks with said periphery.

3. In a pulley roughener, a suitable frame having a rear terminal handle and an intermediate handle or loop, a shaft at the forward end of the frame, disks on the shaft adapted to be brought into engagement with the periphery of the pulley, a series of spring controlled plungers mounted in the frame and having slotted ends for the free passage of the shaft, outer terminal bits on the plungers, studs carried by the sides of the plungers, and cams on the shaft riding over the studs and actuating the plungers in one direction with the rotation of the pulley, the springs forcing the plungers and bits in the opposite direction and against the pulley whereby its surface becomes roughened or indented.

4. In a pulley roughener, a suitable frame, a transverse terminal shaft therefor, terminal friction disks at the ends of the shaft adapted to be pressed against the periphery of a rotating pulley, a series of cams on the shaft within the frame, a series of plungers adjacent to the cams terminating in slotted heads encompassing the shaft, roller studs at the bases of the sides of the heads adapted to be actuated by the cams, a cross bar for the support of the rear ends of the plungers, springs coiled about the plungers and bearing respectively against the cross-bar and the bases of the plunger heads, bits clamped to the outer or forward ends of the plunger heads, and clamping blocks having removed sections to permit of a free rotation for the cams, the parts operating substantially as and for the purpose set forth.

In testimony whereof I affix my signature, in presence of two witnesses.

FRANK GRILL.

Witnesses:
EMIL STAREK,
JOS. A. MICHEL.