(No Model.)

# A. D. PENTZ.

## SELF OILING LOOSE PULLEY.

No. 458,539. Patented Aug. 25, 1891.

FIG. 1.

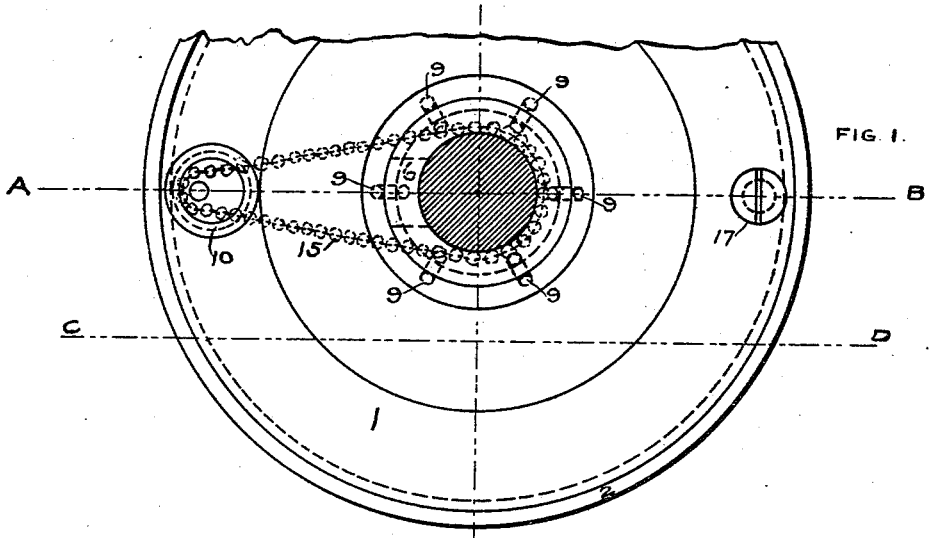
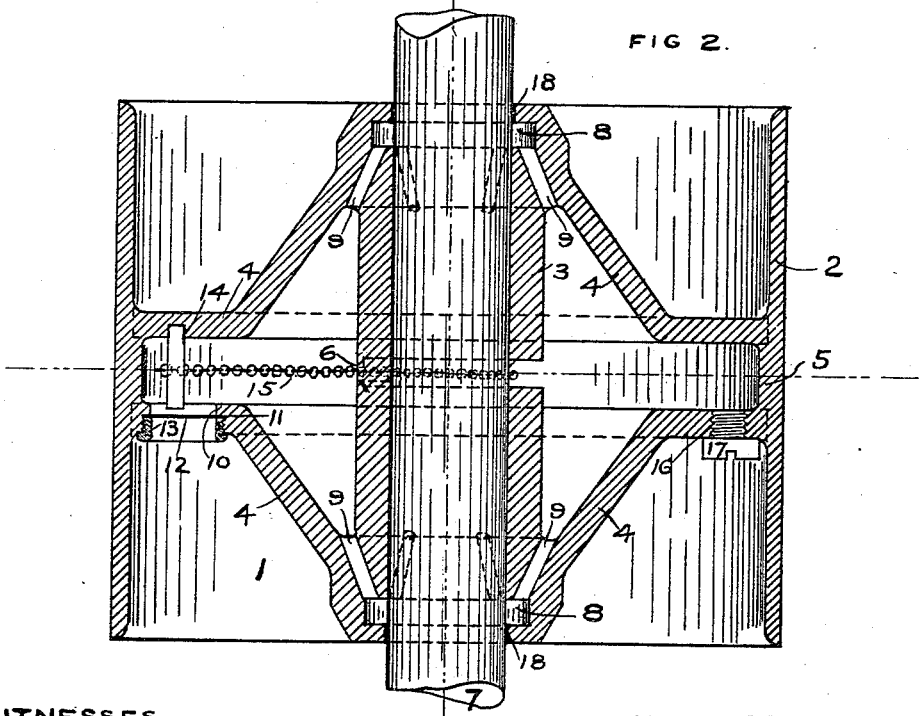



FIG 2.




WITNESSES

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## SELF-OILING LOOSE PULLEY.

SPECIFICATION forming part of Letters Patent No. 458,539, dated August 25, 1891.

Application filed April 9, 1890. Serial No. 347,263. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT D. PENTZ, a citizen of the United States, and a resident of Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Self-Oiling Loose Pulleys, of which the following is a specification.

The object of my invention is to lubricate loose or running pulleys or wheels by providing them with means by which a copious current of oil is carried from a reservoir attached to the pulley, through the medium of an inwardly-moving oil-carrier, to the bearings on the shaft, about and along said bearings to their ends, and from there is returned through suitable channels to the reservoir without waste.

The invention also relates to a method of lubricating a loose pulley or wheel.

The invention consists in the novel details of improvement and the combinations of parts that will be more fully hereinafter set forth, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part hereof, wherein—

Figure 1 is an end view, partly cut away, of a wheel embodying my invention; and Fig. 2 is a central section on the line A B, Fig. 1.

1 is a pulley or wheel to which my invention is applied, 2 being its outer rim.

3 is the hub, cut away to admit the oil-carrier, and the reservoir is inclosed by the walls 4 and that part of the rim marked 5. It is preferred to make this pulley of one casting, this being the most economical construction, although if it be joined at the junction of the wall 4 and the rim 2 by fitting the wall 4 tightly within the rim 2 and against a shoulder on 5, as well as dividing the hub through the neck 6, as indicated by dotted lines, a satisfactory result is obtained.

The pulley is mounted on the shaft 7, which fits it freely between channels 8, near the ends of the hub. These channels 8 are cut into the pulley entirely around the shaft-bearings as capacious as necessary to freely accommodate such oil as may pass through. The width of these channels 8 is such that the usual fillet of oil, that clings to the surfaces within such an angle as that between the shaft 7 and the inner walls of the channels 8, cannot reach across and become attached to the surfaces within the opening 18. From these channels to the reservoir within the pulley are drilled the return passages or holes 9. The shaft-hole through the pulley is enlarged between the channels 8 and the ends of the hubs sufficiently to insure a passage 18 between the reservoir and the open air.

10 is an opening in the wall 4; 11, a shoulder; 12, a pane of mica or the like, and 13 a hollow screw.

Between the mica 12 and the shoulder 11 is usually laid a coat of cement to insure an oil-tight joint, and when the screw 13 is set tight against the mica there will be no leak.

Into the wall 4, preferably opposite the window 12, is placed the support or pin 14, which may extend entirely across the reservoir from wall to wall and enters, in the example shown, the opening 10.

From the support 14 to the shaft 7 and around both extends an oil-carrier or chain 15, slightly longer than necessary to encompass these parts and the paths between them, and designed to be capable of a tractile motion when suspended on the shaft 7 or forced against it by centrifugal force.

In the wall 4 is the tapped hole 16 to admit lubricating material, in which hole is the screw-plug 17, which makes a tight fit.

When in use, the pulley 1 revolves upon the shaft 7, and the carrier 15, being retarded by friction when suspended from the shaft 7, is changed in relative position, so that parts of the carrier which were at the pin 14 are drawn inwardly toward the shaft 7, and parts that were at the shaft 7 fall away toward the pin 14, and so on continuously. When the pulley or wheel is running slowly, this action is confined to the time when the carrier 15 is upheld on the shaft 7 alone, and will cease when the friction on the pin 14 balances that on the shaft 7. When the pulley is running at high speed, centrifugal force, acting on that part of the carrier 15 contiguous to the pin 14, draws that part around the shaft 7, into continual contact with said shaft, causing a motion of the carrier 15 from the shaft 7 to and around the pin 14, and back again to the shaft. When the reservoir is partly filled with oil to a height that should not reach the hub 3 when at rest, (see dotted lines C D, Fig. 1,) the car-

rier 15 during its motion will continually pass through it and some part of the oil will cling to it, and a part of the oil that clings to the carrier will in turn be deposited on the shaft 7, and be spread on the shaft 7 by the passage over it of the neck 6 and gradually be worked along the bearings between the pulley 1 and the shaft 7, until in a few revolutions it appears within the channels 8, where it accumulates until it gains in quantity sufficient to pass into the holes 9 back into the reservoir from whence it came. Some kinds of oil will not spread, but will lie where they are placed. Such oils when passed over by the neck 6 are spread along the journal and a circulation insured, where otherwise there would be but a ring of oil deposited on the shaft by the carrier and not spread along the shaft at all. There is deposited on the shaft 7 at each revolution a considerable quantity of oil, infinitely more than is consumed, and each succeeding turn repeats the amount, so that but few revolutions are necessary to transfer from the reservoir to the shaft and from thence to the bearings between said shaft and pulley a flood of oil. This flood being continually replenished by the carrier 15 is urged through the bearings and either falls into the channels 8 by gravitation if the speed be low, or is thrown into such channels by centrifugal force when the speed is greater, and the same forces act to return the flood to the reservoir through the holes 9. As the reservoir rotates, the contained oil is thrown outward by centrifugal force to the outer part of the reservoir, and the carrier 15 in its inward travel carries the desired amount of oil inward to the shaft. The oil then passes along the shaft back to the mass of oil in the reservoir and is thrown outward with the mass of oil, and is thus used over and over again.

Expansions and contractions of the oil or gases within the reservoir are vented through the holes 9, channel 8, and the opening 18, with no likelihood of waste. The gases are those from lubricating-oils, which are largely mixed with naphtha. When such oils are agitated by the action of the carrier 15, part of the naphtha is evaporated, and there is an expansion of the contents of the reservoir, which if there were no method of escape provided would drive the oil through the bearings with the probability of waste.

The quantity of oil present and the condition of the reservoir and its contents can be seen through the window 10. The reservoir can be filled through the opening 16.

The carrier 15 may be of any material that is capable of conveying oil from the extremes of the reservoir to the shaft reliably. It is found in practice that slow speeds are well accommodated by the fall of oil that occurs within the reservoir at the semi-diurnal stops that are usual in places where such pulleys are used.

I am aware that automatic oilers have for many years been used to lubricate stationary journal-boxes; that such boxes have employed chains and other mechanical means to carry oil from reservoirs to shafts, and that such boxes have been bridged through the loops of such chains to increase the area of bearing-surfaces to the utmost. All such stationary journal-boxes and the object of applying this invention to them I distinctly disclaim.

Having now described my invention, what I claim is—

1. A self-oiling loose wheel having an oil-reservoir, an oil-carrier within said reservoir and extending from about the center thereof outwardly, a shaft, and a carrier-support within said reservoir to which said oil-carrier extends, substantially as described.

2. In a self-oiling loose wheel, the combination of a shaft, a hub adapted to receive a shaft and having a cut-away portion and neck 6, and an endless oil-carrier within said reservoir and extending from said hub outwardly, said neck passing through the loop formed by this carrier, substantially as described.

3. The combination, in a self-oiling loose wheel, of a shaft, an endless oil-carrier arranged upon the shaft within the hub of said wheel, said hub having a cut-away part, a support for the outer part of said carrier, an oil-reservoir inclosing said oil-carrier, and annular channels in the base of said hub near its ends, said hub having internal channels connecting said channels with the reservoir, substantially as set forth.

4. The combination, in a self-oiling loose wheel, of a shaft and hub, the walls 4, carrier 15, carrier-support 14, channels 8, oil-passages 9 in said hub, and opening 18 at the end of the hub, substantially as set forth.

5. The combination, in a self-oiling loose wheel, of a shaft, hub 3, having a cut-away part forming neck 6, a reservoir surrounding said hub, oil-carrier 15, and its support 14, said hub having channels 8 and oil-passages 9, substantially as described.

6. The combination of a shaft, a pulley having a cut-away portion, and a reservoir and a hub within the same, said hub having oil-passages 9, channels 8, carrier 15, and support 14, as set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 31st day of March, 1890.

ALBERT D. PENTZ.

Witnesses:
WM. VANDERLEUK,
WALTER P. ANGUS.