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C. F. W. MANZEL.

OIL PUMP.

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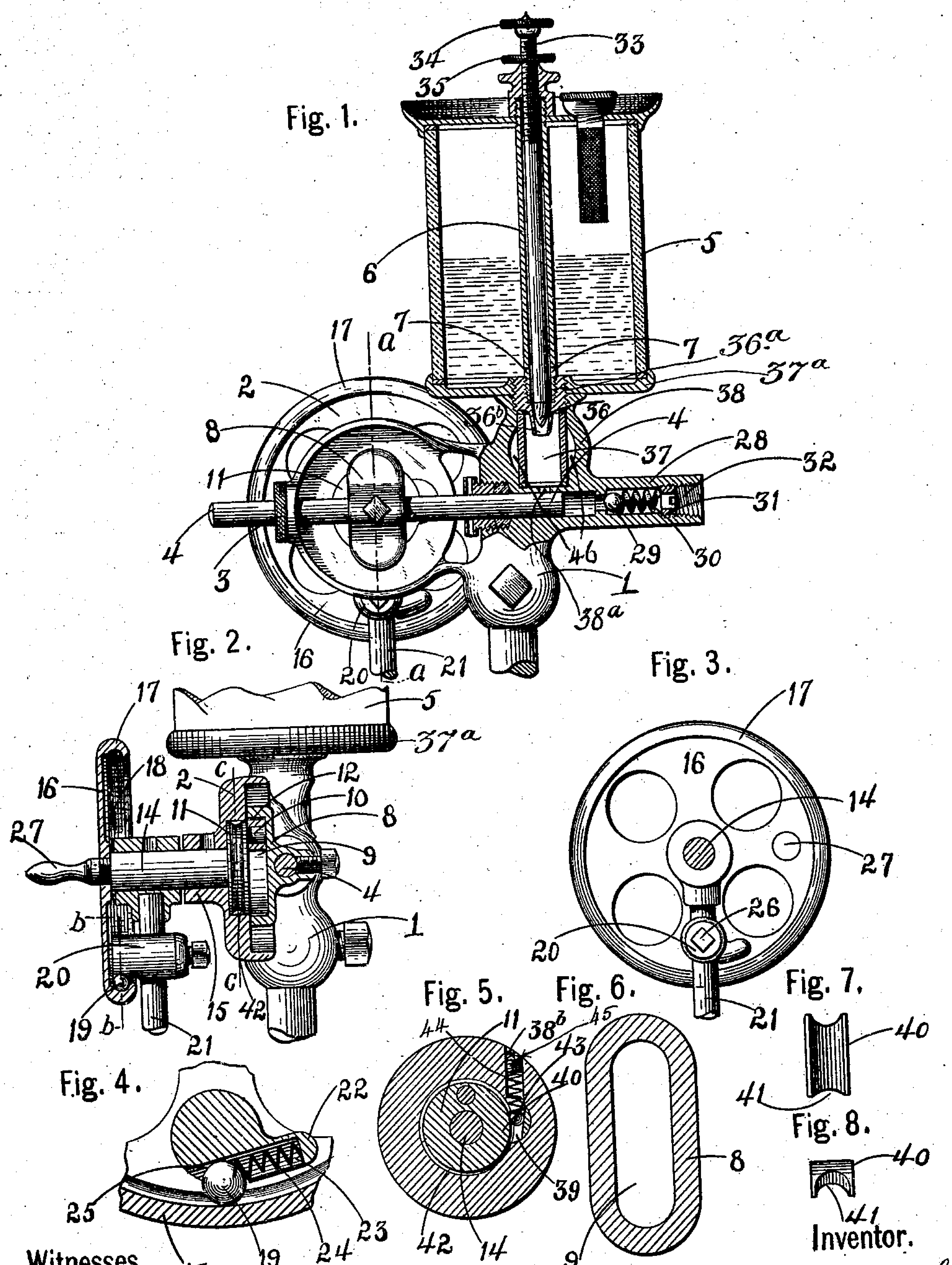

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UNITED STATES PATENT OFFICE.

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OIL-PUMP.

No. 858,405. **Specification of Letters Patent.** **Patented July 2, 1907.**

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To all whom it may concern:

Be it known that I, Charles F. W. Manzel, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Oil-Pumps, of which the following is a specification.

This invention relates to an improved oil cup and the principal objects of the invention are to provide means whereby the component parts of the cup are easily assembled and dismounted and the feed is easily regulated and is arranged so that each drop of oil is visible as it passes out from the cup.

In this device the oil cup is mounted upon a tubular support which projects upward from the frame and also constitutes a receptacle for a glass tube forming a sight feed, being cut away in portions to expose the sight glass for viewing the oil feed. The interior of the sight feed is practically air tight and is connected directly with the feeding chamber by an opening so that when the feeding plunger creates a partial vacuum in the feeding chamber the air in the sight feed tube is likewise partially exhausted and the oil drawn down into the sight feed.

The invention also relates to a means whereby the oil is formed into fairly large globular drops before dropping into the sight tube and is dropped therein in unison with the stroke of the feeding plunger.

The invention also relates to a novel tubular plug which secures the oil cup to the tubular portion of the frame, fastens the sight glass tube in air tight position and also supports the lower end of a vertical tube extending through the oil cup.

The invention also relates to certain details of construction all of which will be fully and clearly hereinafter described and claimed reference being had to the accompanying drawings in which,—

Figure 1 represents a side elevation, partly in section, of my preferred embodiment of the oil cup complete. Fig. 2 represents a section on or about line *a a*, Fig. 1. Fig. 3 represents a detached side elevation of the clutch disk and its vibratile arm. Fig. 4 represents a fragmentary section on or about line *b b*, Fig. 2. Fig. 5 is a section through the crank disk, its shaft and support, illustrating the ball clutch braking device. Fig. 6 is an enlarged section through the cam. Fig. 7 is a detached interior elevation of the grooved brake clutch portion. Fig. 8 is a detached end view of the grooved brake clutch portion.

In referring to the drawings in detail, like numerals designate like parts.

1 represents the frame which is of the usual iron construction and is provided at one end with a side extension 2, having a screw threaded opening in which a collar 3, is mounted, said collar having an opening in which the forward end of the plunger shaft 4, is supported. The oil cup 5, is supported above an intermediate portion of the frame, see Fig. 1, and is provided with an outlet tube 6, having openings 7, through which the oil flows and a feed regulating device which will be specifically described further on. The plunger 4, is provided with a cam 8, having a longitudinal depression 9, in which the crank pin 10, of the rotating disk 11, is adapted to travel. To lessen the friction, the crank pin is provided with a loosely encircling annular ring 12, see Fig. 2.

The crank disk 11, is rigidly mounted upon a shaft 14, which is journaled in a tubular extension 15, of the frame, said frame having an enlarged circular depression in which said disk 11, is rotatably mounted, and a second disk 16, is also rigidly mounted upon the shaft 14, which is provided with a laterally extending circular flange forming an annular ring 17, the interior of which is provided with a groove 18, preferably curved or concaved in cross section in which the clutch ball 19, is adapted to travel. The clutch ball 19, is interposed between a clutch block 20, mounted on a vibrating arm 21, which is loosely hung at one end from the shaft 14, so as to move freely thereon and the groove 18, of the disk. The clutch block 20, is provided with an extension 22, having an interior depression 23, in which a spring 24, is supported and a curved seat 25, for the ball 19, in front of said depression; said seat extending gradually toward the ring 17, substantially as shown in Fig. 4.

In referring to Fig. 4, it will be seen that a movement of the vibratile arm in one direction will cause the clutch block to wedge the ball 19, between the interior of the groove 18, and the seat in the clutch block, thereby frictionally locking the clutch block to the disk and providing means for rotating the disk 16, and its shaft 14, and that a movement in the opposite or reverse direction will move the clutch block without rotating the disk. The clutch block can be adjusted longitudinally on the vibratile arm by loosening the set screw 26, moving it to the desired position and then again tightening the set screw, thus providing means for taking up the wear and also loosening or tightening the adjustment of the ball clutch relatively to the disk 16. The shaft can be rotated by hand if desired, by turning the crank arm 27, see Fig. 2

The principal advantages of my improvement over an ordinary ratchet movement resides in the simplicity of construction, ease of operation owing to the reduction of the friction, non-liability of getting out of order, and that the length of movement of the vibratile arm is not fixed by the space between the ratchet teeth as the ball will wedge against the disk at any point.

The feed regulating device comprises the substantially vertical tube 6, which passes centrally through the oil cup 5, and is provided near its lower end with the openings 7, for the admittance of oil. The lower end of the tube 6, communicates with a substantially horizontal feed tube 28, in which the plunger 4, operates; said tube having a ball valve 29, at its forward end which is normally held in a closed position to seal the tube, by the spring 30, said spring being held in position by the annular ring or collar 31, screwed into the screw threaded end 32, of the feed tube.

A screw bar 33, fitted loosely within the tube 6, is raised or lowered by rotation to change the position of its lower end relatively to the tapered lower end of the opening through which the oil passes and thus vary the annular space between the circular wall of the tapered opening and the lower end of the screw bar to a greater or lesser degree and thereby regulate the flow of the oil. This bar 33, is provided with an enlarged upper end 34, and a lock nut 35, for locking it in any position to which it may be adjusted, and a tapering lower end 36, which terminates in a point and serves to form the oil into globular drops as it passes into the tapering reduced portion 36^b.

A glass tube 37, of suitable diameter is arranged below the cup body being mounted in the vertical tubular cup supporting portion 38, thereby providing a visible feeding device, the drops of oil as they descend being observed through the tube 37, substantially as shown in Fig. 1. The tubular portion 38, is cast integral with the frame and projects vertically upward from an intermediate portion thereof. This tubular portion supports the oil cup and also is shaped to constitute a cage or receptacle for a sight feed tube and a central opening 38^a, affords direct connection between the feed chamber in the feeding tube 28, and the sight feed tube, see Fig. 1. The cage or receptacle is cut away at portions to constitute view openings 46 through which the interior of the sight glass is observed.

The upper part of the tubular portion 38, is interiorly screw threaded and a tubular plug 36^a, is exteriorly screw threaded to fit in the upper part of the tubular portion 38, and also in a screw threaded central opening in the bottom 37^a, in the oil cup, and interiorly screw threaded to receive the screw threaded lower end of the outlet tube 6, see Fig. 1. The plug 36^a, is provided with a central reduced tapering tubular lower portion 36^b, which extends or projects into the glass tube 37, and the bar 33, extends through the plug with its lower end 36, projecting into the tapered opening in the lower tubular portion 36^b, and is adjusted as before described to vary the flow of the oil. The taper of the end 36, of the bar 33, is of a curving or gradually narrowing taper and is greater than the taper of the inner wall of the reduced tapering tubular portion 36^b, see Fig. 1, and said end gradually curves or rounds to its lower extremity forming a rounding extremity. This produces an annular space between the opposite tapering surfaces of the end 36, and the inner wall of the reduced portion 36^b, which increases in thickness from the upper end of the tapered parts downward as the tapers recede from each other, so that the oil first enters between the tapers in a thin annular ring which gradually broadens as it flows downward between the tapering surfaces to which it adheres and finally as it reaches the lower rounded extremity of the end 36, which is above the termination of the reduced portion 36^b, forms itself into a fairly large globular drop by reason of the inner particles being brought into contact. The sight glass tube 37, is forced into rigid air tight position within the portion 38, by screwing the plug 36^a, into the opening in the portion 38, and firmly against the upper edge of the sight glass tube, see Fig. 1.

The screw plug 36^a, performs four offices. 1st. Detachably securing the oil cup to the tubular portion 38. 2nd. Constituting a support for the lower end of the outlet tube. 3rd. Securing the sight glass tube firmly in air tight condition in the tubular portion, and 4th, a means, owing to the peculiar construction of its central depending tapering tubular portion, for forming fairly large globular drops of oil. By this means the rapidity of the feed can be easily and quickly discerned and regulated as the oil forms into globular drops in the tapering lower portion 36^b, of the outlet tube and is drawn therefrom by gravity through the sight glass tube 37.

To prevent the rotation of the shaft and its disks in the reverse direction, a ball clutch device is connected to the disk, the preferable form of which is shown in Fig. 5, in which the frame is provided with a circular opening 38^b, enlarging at its lower end into an irregularly formed chamber 39, at its interior termination in which a curved portion 40, having wedging groove 41, is detachably mounted. The disk 11, is provided with a peripheral groove 42, which registers with the wedging groove 41, and a ball 43, is interposed between the two grooves and is held in position by a spring 44, which is secured in the opening 38^b, by the set screw 45. Upon applying pressure to rotate the disk 11, in the wrong direction, the ball 43, wedges itself between the grooves 41 and 42, and acts as a brake to prevent said rotation, the partial turning of the ball by the movement of the disk causing the curved portion 40, to turn slightly in the chamber and thereby force its edge outwardly toward the periphery of the disk and materially assist in the braking operation.

The operation of the several portions of the device will be readily understood from the foregoing description and drawings.

I claim as my invention.

1. In a device of the class described, an oil cup, said oil cup having a central vertical tube screw threaded at its lower end and a screw threaded central opening in its bottom, a rod extending through said tube and provided with a tapering lower end, a sight feed glass, a frame having an integral vertical tubular portion cut away in portions to provide view openings for the sight glass and which constitutes both a support for the oil cup and a cage for inclosing the sight feed glass and is centrally screw threaded in its upper portion, and a tubular screw plug which screws into the central opening in the bottom for securing the oil cup to the vertical tubular portion, and into which the lower end of the vertical tube in the oil cup screws and having a tubular depending portion into which the tapering lower end of the rod extends to within a short distance of the lower extremity thereof and the inner annular wall of which is tapered to a lesser degree than the lower end of said rod, substantially as set forth.

2. In an oil pump, a support having a vertical tubular

portion which is interiorly screw threaded at its upper end and cut away in part to provide view openings, an oil cup having a bottom provided with a screw threaded opening, a tube extending vertically through the cup and having a screw threaded lower end, a sight glass tube in the vertical tubular portion of the support and a tubular screw plug screw threaded both exteriorly and interiorly and screwing into the screw threaded openings in the bottom of the oil cup and the top of the vertical tubular portion of the support and upon the screw threaded lower end of the vertical tube and having a shoulder engaging against the top edge of the sight glass tube, substantially as set forth.

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