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AUTOMATICALLY OPERATING OILER FOR DIE STOCKS.

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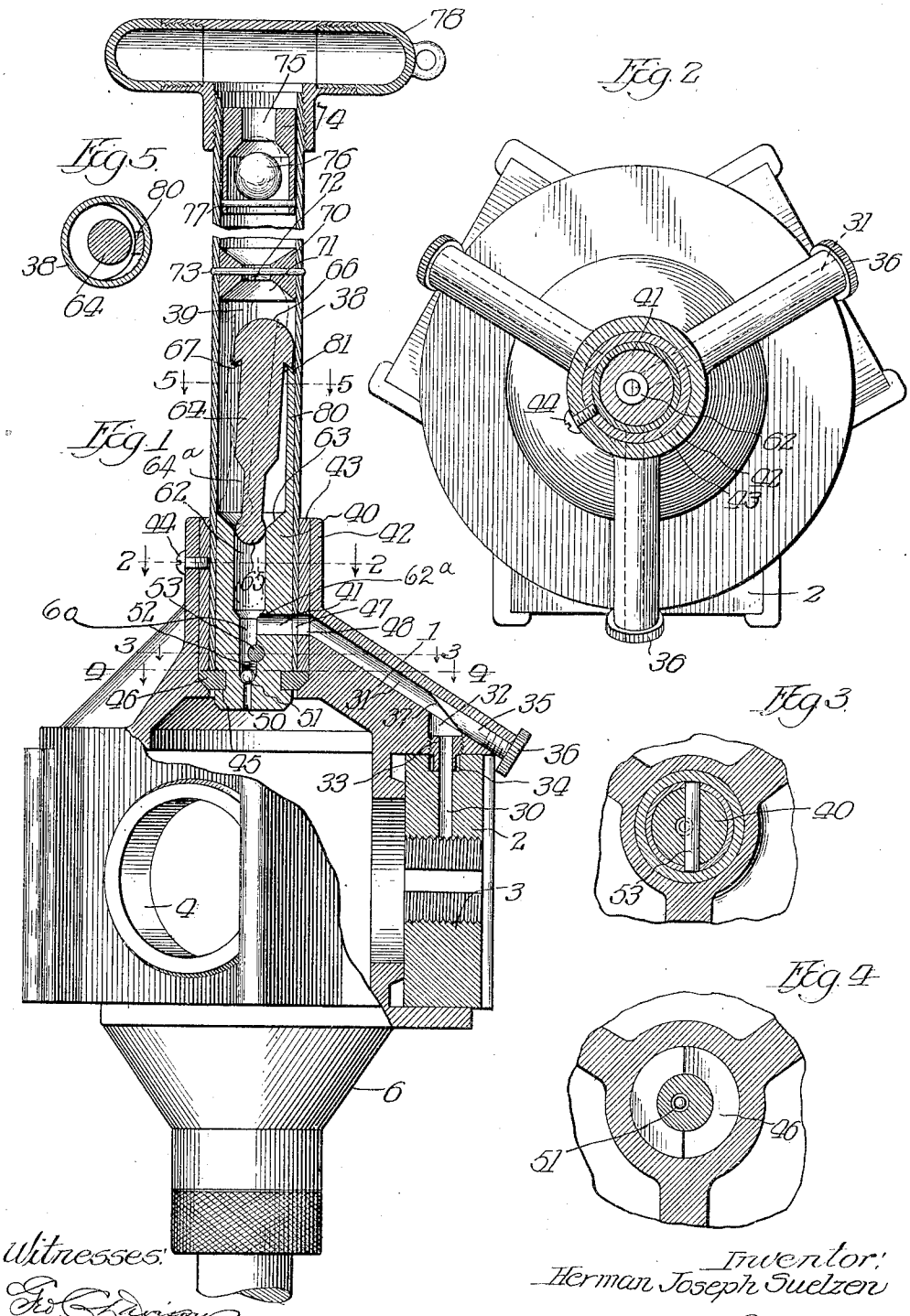
1,086,479. Patented Feb. 10, 1914.



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AUTOMATICALLY-OPERATING OILER FOR DIE-STOCKS.

1,086,479. Specification of Letters Patent. Patented Feb. 10, 1914.

Application filed May 7, 1913. Serial No. 765,987.

To all whom it may concern:

Be it known that I, HERMAN JOSEPH SUELZEN, a citizen of the United States, residing at Chicago, Illinois, have invented certain new and useful Improvements in Automatically-Operating Oilers for Die-Stocks, of which the following is a specification.

The essential object of this invention is to provide a new and improved means for feeding oil to the dies which are used for threading pipe or the like, and in the drawings, the same is shown as being applied to a die stock like that shown and described in my pending application for patent, Serial No. 745,840, filed February 3, 1913. It should be understood, however, that this oiler may be used in conjunction with any form of die stock, or any other form of tool requiring oiling.

This invention is an automatic oiling device, meaning thereby that it is a mechanism for automatically feeding or forcing quantities or bodies of oil from a chamber or reservoir to the tool where the oil is required, manual operation of the oil-feeding means being wholly unnecessary.

In the drawings, Figure 1 is a sectional view of a die stock in connection with which the oiling device is used, the lower part of the casing of the stock being shown in elevation; Fig. 2 is a transverse sectional view on the line 2—2, Fig. 1; Fig. 3 is a transverse sectional view on the line 3—3, Fig. 1; Fig. 4 is a transverse sectional view on the line 4—4, Fig. 1; and Fig. 5 is a transverse sectional view on the line 5—5, Fig. 1. Each view, Figs. 2 to 5, inclusive, is taken looking downwardly in Fig. 1.

The die stock is provided with a body 1 for supporting the dies 2, said body being preferably hollow and being also polygonal in cross section, each side of the polygon being formed by a rectangular wall, and conical ends 6 and 9 extend from the polygonal prism to the operating levers. The dies 2 are provided with the screw-threaded openings 3, which openings are in axial registration with other openings 4, and the pipe to be threaded passes through an opening 4 and that die 2 which is in registration therewith, it being understood that, as usual, the pipe to be threaded is firmly held in position by a vise, the stock and die being adapted to rotate about the pipe as an axis. For further details of the construction of the die stock itself, reference is made to my said pending application Serial No. 745,840.

Each die 2 is provided with a duct 30 which terminates at the point where the oil is to be applied. The body of the stock 1 is provided with a conduit or duct 31, there being as many conduits 31 as there are dies in the stock, three dies 2 and three conduits 31 being shown herein by way of example. Below each conduit 31 is a small chamber 32, and a nipple 33 is screwed into the lower end of said chamber, said nipple being perforated and the perforation therethrough being in effect a continuation of the duct 30. The die 2 itself is recessed at 34 and the nipple 33 projects into said recess, said nipple being adapted, therefore, to assist in holding the die 2 in place. A cylindrical pin 35 provided with the knob 36 is rotatable within each duct 31 and the end 37 of said pin is beveled. When the pin is in the position shown in Fig. 1, the oil can flow from the duct 31 through the chamber 32 and nipple 33 into the duct 30, which last-mentioned duct conveys it directly to the pipe upon which the threads are being cut. If, however, the pin 35 be rotated 180 degrees, the beveled end 37 will close the mouth of the chamber 35 and will prevent the passage of oil from the conduit 31 to the duct 30.

The upper operating lever or shaft 38 is provided with a central reservoir or cavity 39. Said shaft 38 is secured to the plug 40, which said plug 40 is provided with a short duct 41, said duct 41 being adapted to register from time to time with one or the other of the ducts 31. The body 1 of the stock carries a collar 42 within which the sleeve 43 is placed, said sleeve being held against longitudinal movement by the set-screw 44. The plug 40, near its lower end, is provided with an annular recess within which the washer 46 seats, said washer being adapted to rest against and to engage the lower edge of the wall or sleeve 43. As long as the sleeve 43 is locked in place by the set-screw 44, the washer 46 prevents longitudinal movement of the plug 40 and of the hollow operating lever 38 to which said plug is secured, although permitting rotation of the plug and lever within the sleeve 43 and the collar 42. The wall of the operating lever

38 is perforated at 47, and the sleeve 43 is perforated at 48, these perforations 47 and 48 being necessary in order to permit communication between the duct 41 and that particular conduit 31 to which the duct is at any time presented. At its lower end the plug 41 is provided with an air hole or vent 50 which is kept normally closed by a small ball 51 against which the helical spring 52 is adapted to bear, said spring being interposed between the ball 51 and the pintle 53, which pintle passes through the plug at right angles to its axis of rotation, the pintle serving, also, to sceure the plug to the hollow lever 38.

It will be obvious that the construction of parts which have been described up to this point in this specification is the same as the constructions shown and described for like parts in my other application for United States Letters Patent for a manually-operated oiling device recently filed as Serial No. 765,988.

The plug 40 itself differs in certain respects from the plug shown in my said other application for a manually-operated oiler and it will be obvious that the construction set forth in this and the succeeding paragraphs of this specification, has reference only to the automatically-operated oiler forming the subject-matter of this application. The plug 40 is provided with an axial perforation or conduit 60 which is in communication with the duct 41, and said plug, adjacent its upper end, Fig. 1, has another axial duct or chamber 62, the mouth 63 of which is beveled or tapered. The conduits 50, 60, and 62 are preferably, though not necessarily, in axial alinement with each other. Chamber 62 is preferably circular in cross-section and greater in diameter than chamber 60, which, in turn, is considerably greater in diameter than port 50, and chamber 62 has the beveled floor 62^a. It should be understood, however, that the arrangement of parts just described, though convenient, is not necessary, and that many obvious modifications of details may be made, the salient feature being that the chamber 62 is provided in such manner as to coöperate advantageously with valve 64.

Within the chamber 39 of the hollow shaft 38 is a floating valve 64, the construction of which most clearly appears in Fig. 1 of the drawings. Said floating valve 64 is, on the whole, cylindrical in shape. At its lower end, Fig. 1, it is rounded or curved at 65, and a shank 64^a connects the ball-like end 65 to the main body of the valve, the shank 64^a being less in diameter than the end 65. Said ball-like end 65 tends normally to force its way into the chamber 62 (as shown in the lower dotted lines, Fig. 1), said member 64 being normally carried downward in Fig. 1 by gravity and its ball-like end 65 being guided into the chamber 62 because the mouth of the chamber is beveled at 63. It should be understood that the floating valve 64 is preferably made of metal so as to give said valve the desired and necessary weight, and that the term "floating" means that the member 64 (which is also properly called a plunger) is detached from the other members, not that it is lighter in weight than the oil. At its upper end, Fig. 1, the plunger 64 is also rounded off at 66 and between the rounded end 66 and the main body of the plunger 64 is the shouldered seat 67.

Within the chamber 39 is a washer 70 preferably curved at 71 to conform in shape to the end 66 of the plunger 64 and provided with a perforation 72. Said perforation is open when the plunger 64 is in the full line position, Fig. 1, but closed when same is in the upper dotted line position in said figure, and the washer 71 may be held in place by a pin 73 or by any other convenient means. Within the chamber 39 is a sleeve 74 perforated at 75, and by said sleeve 74 the ball valve 76 is received. Said ball 76 is made of fiber or other material which is lighter in weight than oil. Movement of the fiber ball valve 76 in one direction is limited by the stem 77, and movement of said ball 76 in the other direction beyond the mouth of the duct 75 is impossible. The sleeve 74 is not fixed tightly to the operating lever 38 but is adapted to slide therewithin, rising and falling by gravity. When the oil within the chamber 39 reaches a higher level than the stem 77, the oil will buoy up the fiber ball 76 and raise same to the dotted line position; but when the tool is inverted, the oil within the hollow handle 78 will buoy up the ball valve 76 and force same toward the stem 77. The hollow handle 78 is secured to the shaft 38 in any convenient manner, one construction being shown in the drawings. It is not deemed necessary to describe the same fully in detail in this application.

For convenience of description it will be assumed that the pipe or rod to be threaded is held in such position that, during the threading operation, the parts shown in Fig. 1 will rotate in a clockwise direction in said figure, and, conversely, that said parts will move in a counter-clockwise direction when the stock and dies are being unscrewed from the threaded pipe. For convenience also, the ball-like end 65 of the plunger 64 is called the lower end and the rounded end 66 is called the upper end, though what is the lower end of the plunger or any other member in one position will be the upper end when the stock has been rotated half way around the pipe. The handle 78 is made in two or more sections, one or more of which may be unscrewed, and the cap at the left-hand end of the handle, Fig. 1, hav-

ing been removed, the oil is poured in through the opening remaining after the removal of the cap. Enough oil is inserted at the start to fill both the reservoir 39 and the hollow handle 78, and when said chambers are so filled, the oil will entirely surround the valves 64 and 76. At first the lower end of the plunger 64 will project into the chamber 62 (which chamber is of substantially the same diameter as the ball-like end 65), assuming the lower dotted line position, and the plunger 64 will thus prevent passage of the oil from the chamber 39 into the chamber 62 and the ports or ducts with which said chamber is in connection. As the stock is rotated clockwise, however, the plunger 64 will slip or move from the lower dotted line position, Fig. 1, toward the upper dotted line position in said figure, and will reach said upper dotted line position at or before the time that the shaft 38 has rotated around the pipe 180 degrees from the position of Fig. 1. Simultaneously with this movement of the plunger 64, the ball 76 is moving toward the full line position, being buoyed upwardly and pressed into engagement with the stem 77 by the oil. As the stock rotates through the third and fourth quadrants and again approaches the starting position shown in Fig. 1, the plunger 64 will move from the upper dotted line position to the lower dotted line position.

Although no oil can enter the chamber 62 at the start or while the parts are in the full line positions of Fig. 1, a certain quantity of oil will enter the chamber 62 as soon as the plunger 64 passes out of chamber 62, and this oil will gradually fill the chambers 60 and 62, as well as the ducts 41, 31, and 30, and when, because of the rotation of the stock upon the pipe, the plunger 64 again enters the chamber 62, said plunger will cause a certain impact upon the oil which is within the chamber 62 and will force same through the various ducts and channels below said chamber, such impact assisting the natural force of gravity and feeding the oil positively and surely toward the die 2. The head 65 of the plunger will act like the piston of a pump, and in an obvious manner will force out of the chamber 62 the oil which has gathered therein. The beveled floor 62^a limits the downward movement of the plunger 64, and the providing of the ball-like end 65 and shank 64^a permits a greater freedom of movement and of adaptability to varying positions than would be the case were the end that enters the chamber 62 cylindrical in shape. The oil within the chambers 60 and 62 cannot escape through the air-hole 50 because said air-hole is normally closed by the spring-controlled ball-valve 51, but, as more specifically explained in my other application for patent for a manually-operated mechanism, said ball-valve 51 acts as a vacuum relief valve permitting atmospheric air to enter through the port 50 whenever a vacuum or partial vacuum is created within chamber 62, as does occur each time the lower end of the plunger leaves the chamber. Since the sleeve 74 is slidable within the hollow handle (it being understood that said sleeve is made of brass or other metal so as to give it weight) the sleeve also will cause an impact upon the oil within the chamber 62, for as the sleeve slides from top toward the bottom in Fig. 1, the ball 76 will move to the dotted line position as soon as the ball strikes the body of oil, and as the ball seats in the dotted line position it closes the port 75 so that the full force or ramming effect of the sliding sleeve 74 is expended upon the oil, thus to assist in the expulsion of the oil through the various ducts within the plug 40. When the shaft is inverted from the position of Fig. 1 and the plunger 64 has assumed the upper dotted line position, the upper end of plunger 64 will close the port 72, and thus retain the oil within the reservoir 39, this being desirable when the supply of oil runs low. It will be observed that all movements of the plunger 64 are automatic, and are caused by gravity alone, and that since plunger 64 enters the chamber 62 and leaves the same once during each complete revolution of the stock about the pipe, a volume of oil is fed toward the die at every such revolution.

When the thread has been cut upon the pipe and when the stock and die are merely being removed from the pipe it is not necessary to feed any oil to the die. On the contrary, at such time flow of oil should be prevented if possible. Extending upwardly from the plug 40 is the web 80, the upper end 81 of which is beveled so as to coöperate with the beveled seat 67 upon the plunger valve 64. If the device be moved from the starting position shown in Fig. 1 and in a counter-clockwise direction, the plunger valve 64 will move toward the upper dotted line position the same as if the stock were being rotated in a clockwise direction, but during the last quadrant or last two quadrants of this revolution, the plunger 64 will normally tend to ride upon the right-hand side, Fig. 1, of the hollow shaft 38, and when it comes into that position, same being the position depicted in full lines in the drawing, the seat 67 will catch upon the beveled edge 81 and thus limit the downward movement of the floating plunger 64. This locking of the plunger 64 will keep same from entering chamber 62 and thus prevent the positive feeding of the oil toward the die.

It will be obvious that many changes in the details of construction and arrangement of parts may be made without departing from the scope of the invention or of the

various claims, particular attention being directed to the fact that the salient feature of the invention is the combination of the floating plunger or valve 64 and the chamber 62 with which said valve coöperates.

I claim as my invention:

1. In a tool of the character described, the combination of a hollow shaft having an oil reservoir therewithin, a chambered plug at one end of said reservoir, the mouth of said chamber being beveled, a conduit extending from said chamber to the point where the oil is to be applied, a plunger having a curved end adapted to coöperate with said beveled mouth, a washer adapted to be engaged by the opposite end of said floating valve, said washer conforming in shape to the shape of said opposite end, and means permitting the entrance of oil into said reservoir.

2. In a tool of the character described, the combination of a hollow shaft having an oil reservoir therewithin, a chambered plug at one end of said reservoir, there being a communication from said chamber adapted to convey the oil therefrom, a valve-like member within said oil reservoir and detached therefrom, said valve-like member being adapted to enter said chamber and impact upon the oil within same, and means for preventing said valve from entering said chamber when the stock is being rotated in one direction.

3. In a tool of the character described, the combination of a hollow shaft having an oil reservoir therewithin, a plug at one end of said reservoir, there being a port in said plug, a washer at the end of said reservoir opposite to said plug, said washer being also provided with a port, a valve within the reservoir, the lower end of said valve being adapted to close said first-mentioned port and the upper end being adapted to close said second-mentioned port, and means to convey the oil from said first mentioned port to the place where the oil is required.

4. In a tool of the character described, the combination of a hollow shaft having an oil reservoir therewithin, a plug at one end of said reservoir, said plug being provided with a port, a washer at the other end of said reservoir, said washer also being provided with a port, a valve within the reservoir and located intermediate said plug and said washer, the distance between said plug and said washer exceeding the length of said valve, the lower end of said valve being adapted to close the port in said plug and the upper end of said valve being adapted to engage said washer, and means to convey the oil from said port to the point where the oil is to be applied.

5. In a tool of the character described, the combination of a hollow shaft having an oil reservoir therewithin, a plug at one end of said reservoir, there being a port in said plug, a web or washer at the end of said reservoir opposite to said plug, said washer being also provided with a port, a valve within the reservoir, the lower end of said valve being adapted to close said first-mentioned port and the upper end being adapted to close said second-mentioned port, said valve being detached from and movable independently of all of said other mentioned parts, and means to convey the oil from said first-mentioned port to the place where the oil is required.

6. In a tool of the character described, the combination of a hollow shaft, a hollow handle secured thereto, a sleeve slidable within said shaft, a valve lighter in weight than oil retained within said sleeve, said sleeve being provided with a port which said valve is adapted to close, and a communication extending from the chamber within which said sleeve reciprocates to the member to which the oil is to be applied.

7. In a tool of the character described, the combination of a hollow shaft, a hollow handle secured thereto, a sleeve slidable within said shaft, said sleeve being provided with a port, a valve lighter in weight than oil retained within said sleeve and adapted to close said port, means in connection with said sleeve to limit the movement of said valve, and a communication extending from the chamber within which said sleeve reciprocates to the member to which the oil is to be applied.

8. In a tool of the character described, the combination of a hollow shaft, a hollow handle secured thereto, a sleeve adapted to reciprocate within said hollow shaft, said sleeve being provided with a port, a valve adapted to close said port, a plug at the end of said hollow shaft opposite said sleeve, said plug also being provided with a port, means to convey the oil from said second-mentioned port to the point where the oil is to be applied, and a valve within the hollow shaft adapted to control said second-mentioned port.

9. In a tool of the character described, the combination of a hollow shaft containing an oil reservoir, a chambered plug at one end of said reservoir, a conduit extending from the chamber in said plug to the point where the oil is to be applied, and a plunger adapted to move automatically by gravity first into then out of the chamber within said plug, said chamber being circular in cross section and of approximately the same diameter as the end of said plunger.

10. In a tool of the character described, the combination of a hollow shaft containing an oil reservoir, a chambered plug at one end of said reservoir, a conduit extending from the chamber in said plug to the point where the oil is to be applied, and a plunger

adapted to move automatically by gravity first into then out of the chamber within said plug, said chamber being circular in cross section and of approximately the same diameter as the end of said plunger, said plunger being detached from said plug and said reservoir.

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

HERMAN JOSEPH SUELZEN.

Witnesses:
ELLIOTT R. GOLDSMITH,
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."