R. H. WILDER & J. C. KAUMEIER.

LUBRICATOR FOR FORGING PRESS DIES.

APPLICATION FILED APR. 22, 1918.

1,284,168. Patented Nov. 5, 1918.

Fig. 1.

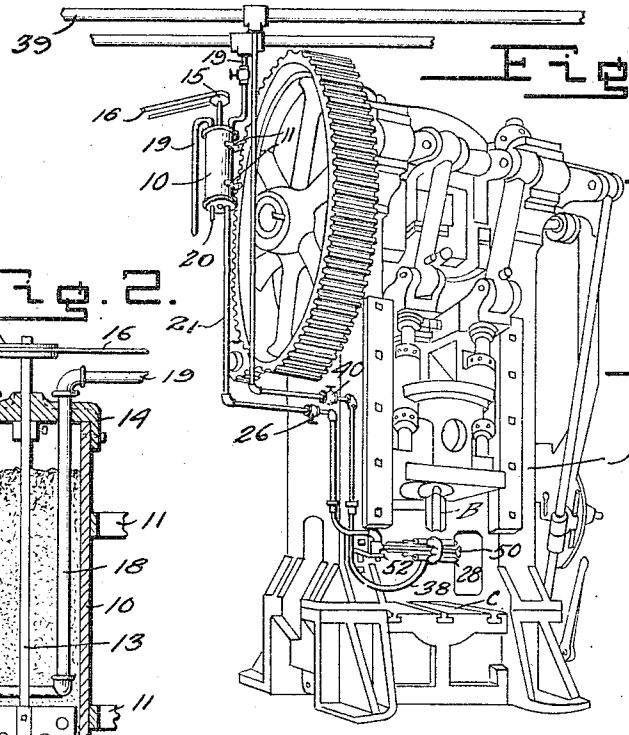


Fig. 2.

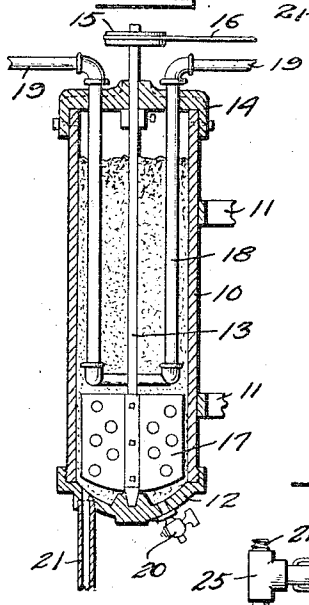


Fig. 3.

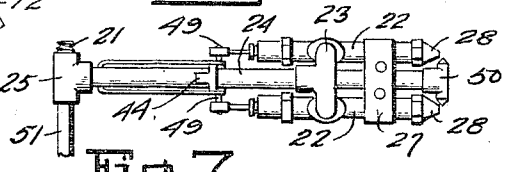


Fig. 4.

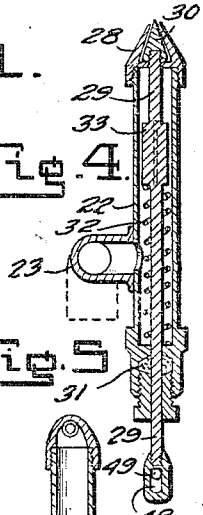


Fig. 5.

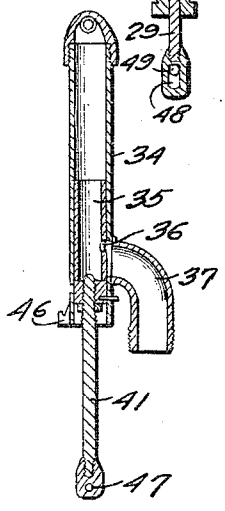


Fig. 7.

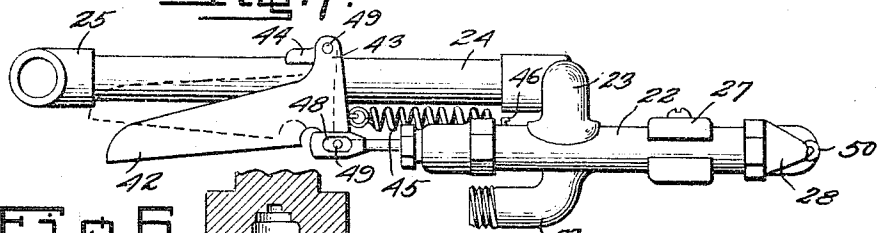
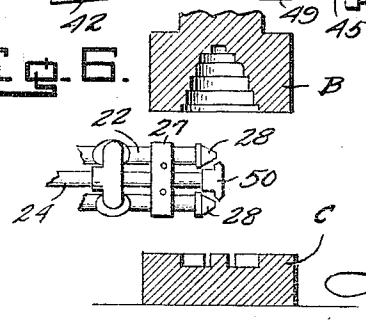


Fig. 6.



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UNITED STATES PATENT OFFICE.

RICHARD H. WILDER AND JOHN C. KAUMEIER, OF PORT HURON, MICHIGAN.

LUBRICATOR FOR FORGING PRESS-DIES.

1,284,168. Specification of Letters Patent. Patented Nov. 5, 1918.

Application filed April 22, 1918. Serial No. 230,099.

To all whom it may concern:

Be it known that we, RICHARD H. WILDER, a subject of the King of Great Britain, a resident of Port Huron, in the county of St. Clair and State of Michigan, and JOHN C. KAUMEIER, a citizen of the United States of America, and a resident of Port Huron, in the county of St. Clair and State of Michigan, have jointly invented certain new and useful Improvements in Lubricators for Forging Press-Dies, of which the following is a specification.

The present invention relates to lubricators, and has particular reference to an improved type of lubricator adapted particularly for use in supplying oil to dies for forging presses and the like.

In the use of forging presses and like machines, it is necessary to supply the dies with lubricant to prevent the dies from overheating, cracking, and undue wear. The present method employed for supplying the oil to the dies is to provide a swab or brush with the oil and graphite thereon, and it is found in practice that the swab or brush does not thoroughly lubricate the crevices and pockets of the dies, and also that excess oil is supplied to various portions of the dies, causing blowouts and disfigurement of the forgings or, if allowed to flow out, would be lost or wasted.

It is an object of this invention to overcome these disadvantages and difficulties by providing a lubricator capable of spraying oil into the dies and to all of the crevices and pockets therein, and to evenly distribute the oil and graphite over the entire inner surfaces of the dies.

The invention further aims at the provision of a lubricator with means for maintaining the oil and graphite in a thoroughly mixed, and in a free flowing condition, and to also maintain the lubricant properly heated so that the lubricant may easily spread over the inner surfaces of the dies and thoroughly lubricate the same.

The above, and various other objects and advantages of this invention will be in part pointed out, and in part become apparent, from the following detailed description of the present preferred embodiment, the same being illustrated in the accompanying drawing, wherein,

Figure 1 is a perspective view of a conventional form of forging press having a lubricator constructed according to the present invention applied thereto.

Fig. 2 is a fragmentary enlarged longitudinal section through the supply container and the parts directly connected thereto.

Fig. 3 is a detail enlarged side elevation of the nozzle employed.

Fig. 4 is a fragmentary further enlarged section taken longitudinally through one of the oil valves, showing the conical structure of the nozzle and valve, and the view showing in dotted lines the connection to the oil supply pipe.

Fig. 5 is a similar view through the air valve and tip therefor.

Fig. 6 is a vertical section through the upper and lower dies of a forging press, showing the same separated and illustrating the application of the nozzle of this invention arranged between the dies.

Fig. 7 is an enlarged side elevation of the complete nozzle.

Referring to this drawing, A designates a forging press of conventional form, and which is fitted with upper and lower die sections B and C.

The lubricator comprises a casing or container 10 which may be of cylindrical form and supported by brackets 11 to one side of the press, or to any convenient means of support for sustaining the container at the desired elevation. The container 10 has a head or bottom 12 upon its lower end within which is formed a bearing for the lower end of an agitator shaft 13 which rises centrally through the container and has bearing near its upper end in a cross arm 14 detachably secured across the top of the container. Any suitable means may be provided for turning the shaft 13, such as a pulley 15 mounted on the shaft and an operating belt 16 trained over the pulley.

The lower end of the shaft 13 is provided with any desired number of paddles 17 which may be perforated as shown and which outstand from the shaft to engage in the mass of lubricant which is adapted to be poured into the container 10. The agitator maintains the lubricant mass in a thoroughly mixed state. The lubricant is heated by a pipe 18 which is looped downwardly through the cross arm 14 to a considerable extent and is connected at its upper ends to a steam pipe 19 for supplying a heating medium to the loop 18. The head 12 is provided with a

drain cock 20, and a supply pipe 21 is connected through the head and leads to the nozzle hereinafter described.

The nozzle comprises a pair of tubes 22 connected by a T 23 intermediate their ends, and which preferably extends across the upper sides of the tubes 22. A branch pipe 24 leads from the T 23 to a coupling 25 to which the lower end of the feed pipe 21 is connected. A valve 26 is preferably interposed in the feed pipe for controlling flow of the lubricant to the nozzle. A cross brace 27 in the form of a clamp is secured across the upper and lower sides of the tubes 22 for securing the same together, and is preferably located near the outer ends of the tubes. Detachably threaded on the outer ends of the tubes are tips 28 conical in form and through which the oil and graphite are sprayed. As shown in Fig. 4, each tube 22 has a valve stem 29 extending axially therethrough and provided with a tapering valve head 30 upon its outer end adapted to fit in the nozzle 28 and not only control the passage of the lubricant therethrough, but also break up the lubricant into a fine spray. The inner end of the stem 29 passes through a packing box 31 formed in the inner end of the tube 22. An expansion spring 32 is seated at one end against the packing box 31 and bears at its other end against a shoulder 33 formed upon the stem 29 near its outer end. The spring 32 normally maintains the valve 30 closed.

Between the tubes 22, and supported in the bracket 27, is an air tube 34 which, as shown in Fig. 5, is of substantially the same length as the tubes 22 and provided therein with a sleeve valve 35 having a port 36 in its lower side adapted to open into a downwardly and inwardly directed nipple 37 to which is attached one end of an air pipe 38 which leads from an air supply pipe 39. A valve 40 is interposed in the air pipe 38 for controlling the flow of air under pressure to the tube 34. The sleeve valve 35 has a stem 41 which projects inwardly from the tube 34 in parallelism with the stems 29. A hand lever 42 which is substantially in the form of a yoke and provided with upturned ears 43 is pivoted upon a bracket 44 secured to the upper side of the branch pipe 24, the handle 42 extending across the underside of the branch pipe 24. A spring 45 is connected at one end to the lower part of the handle 42 and at its other end upon a hook 46 which rises from the tube 34 for normally maintaining the rear end of the handle 42 downward from the pipe 24. The stem 41 has an aperture 47 in its rear end by means of which the stem is pivoted to the lower end of the lever 42. The stems 29, however, are provided upon their inner ends with longitudinal slots 48 through which pins 49 pass, which pins project outward from the lower ends of the hand lever 42. There is thus a lost motion between the air and fluid valves.

The forward end of the air tube 34 is provided with a T-shaped tip 50 the ports of which open laterally and toward the ports of the tips 28 whereby the jets of air under pressure create suction at the tips 28 and draw the lubricant from the tubes 22 and spray the lubricant in the desired manner.

The coupling 25 is provided with a depending shank 51 pivotally mounted in a bracket 52 secured to the side of the forging press A in position to support the nozzle between the die sections B and C, as shown in Fig. 6, when the nozzle is swung inward. When the nozzle is in position the tubes 22 are arranged one above the other with a jet for each die section B and C as clearly shown in Figs. 1 and 6.

The operation is apparent, for when the valves 26 and 40 are open the lubricant and the air are fed to the tubes 22 and 34. When the dies are separated the nozzle is swung into position between the dies and the handle 42 is pressed against the pipe 24 to the desired distance. The initial movement of the handle opens the air valve 35 only to supply air to the tip 50 and thus create a suction at the tips 28. Further movement of the handle opens the valves 30 and admits the flow of the lubricant from the tips 28. As the tip 50 has its orifices directed toward the concavities of the die sections B and C, the lubricant issuing from the tips 28 is sprayed directly into the die sections and is diffused over a relatively large area so that all the crevices and pockets in the dies are reached.

The quantity of lubricant may thus be manually controlled and regulated to supply a quantity of lubricant proportionate to the depth and size of the concavities in the dies. The dies thus thoroughly lubricated prevent the sticking of forgings and the like therein, prevent disfigurement of the forgings and the overheating of the dies, and will offset to a large extent the cracking and undue wear upon the dies.

The tips 28 and 50 of the oil and air valve casings are detachable and interchangable and may be made with openings of different sizes and shapes for different sizes and kinds of dies to be lubricated.

Various modifications and refinements may be made in the details of construction and design of the above specifically described parts without departing from the spirit of this invention, the modifications being restricted only by the scope of the following claims.

What is claimed is:

1. In a lubricator, the combination with

a machine having movable parts, of a container for lubricant adapted to be supported above said parts, a nozzle pivoted to the machine adapted to be swung into the path of said parts when moved out of the way, and a connection between the nozzle and the container for supplying liquid lubricant to the nozzle.

2. In a lubricator, the combination of a container, a heating pipe projecting into the container, an agitator mounted in the container for mixing the lubricant while being heated, and a portable nozzle connected to the container for spraying the lubricant.

3. In a lubricator, the combination of a container, a sprayer nozzle communicating with the container and having a valve therein, a compressed air nozzle connected to the sprayer nozzle and having a valve therein, and a handle on the sprayer nozzle connected to both of said valves for operating the same to admit the escape of air under pressure for drawing the lubricant out of the sprayer nozzle.

4. In a lubricator, the combination of a container, a sprayer nozzle connected to the container and having a valve therein, a compressed air nozzle connected to the sprayer nozzle and having a valve therein, and a handle connected to said valves with a loose connection between the valve of the sprayer nozzle and the handle for primarily opening the air nozzle prior to the opening of the sprayer nozzle.

5. In a lubricator, the combination of a container, a nozzle connected to the container, and air pressure nozzle, said nozzles having tips arranged in proximity and at an angle to each other, valves in said nozzles, and a common means for operating the valves to control the feeding and spraying of the lubricant from the nozzles.

6. In a lubricator, the combination of a container, a nozzle connected to the container, an air feeding nozzle arranged adjacent to the first nozzle, a valve for each nozzle and an operating handle connected to both valves with a loose connection with the air nozzle valve for primarily opening the lubricant nozzle and primarily closing the lubricant nozzle during the operation of the lubricator.

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