Feb. 17, 1942. F. L. ELLIS 2,273,698

AUTOMATIC OIL FEEDING DEVICE FOR METAL WORKING MACHINES

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Fig. 1

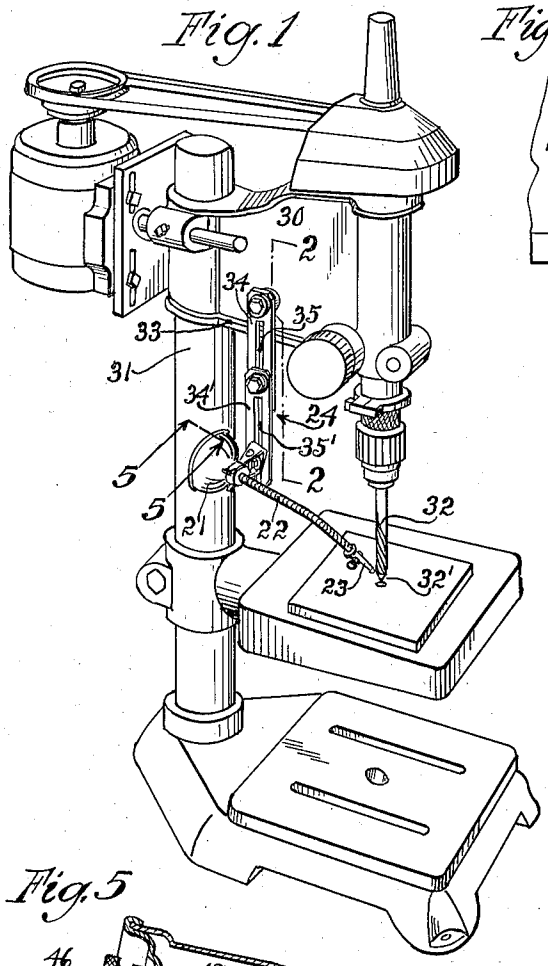
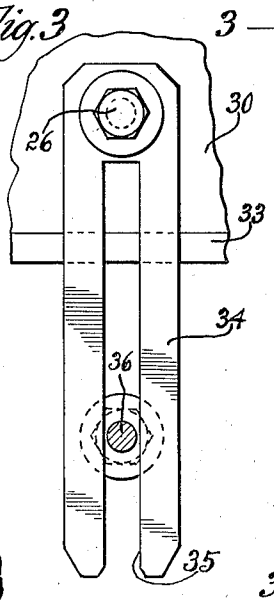


Fig. 3



3 → Fig. 2

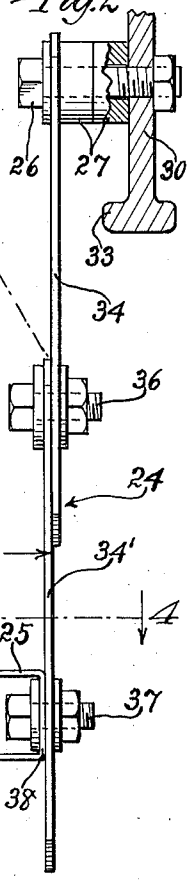
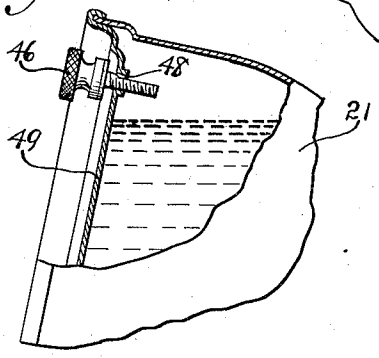


Fig. 5



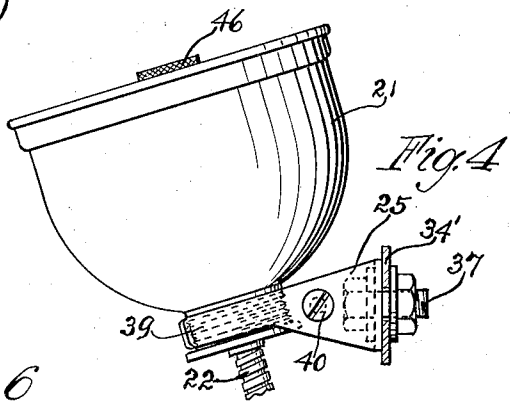


Fig. 4

Fig. 7

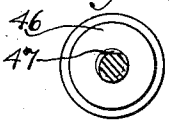
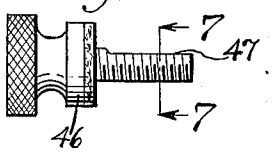


Fig. 6



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Fig. 11

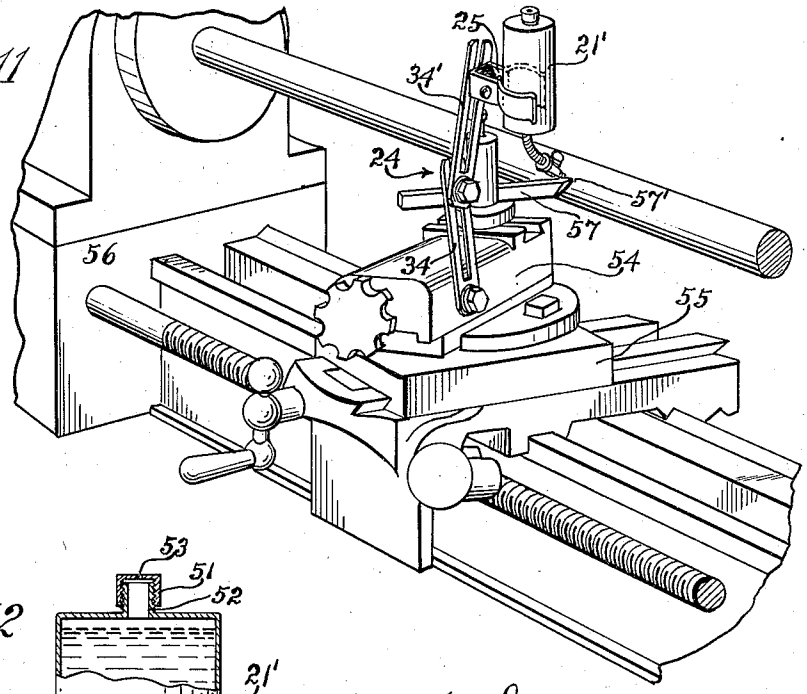


Fig. 12

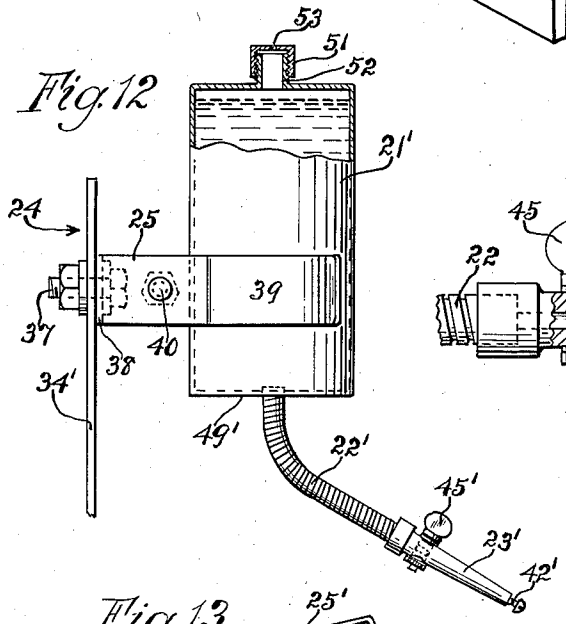


Fig. 8

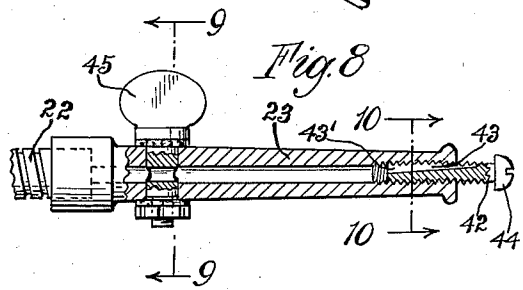


Fig. 9

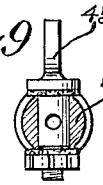


Fig. 10

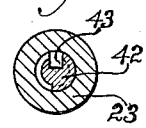
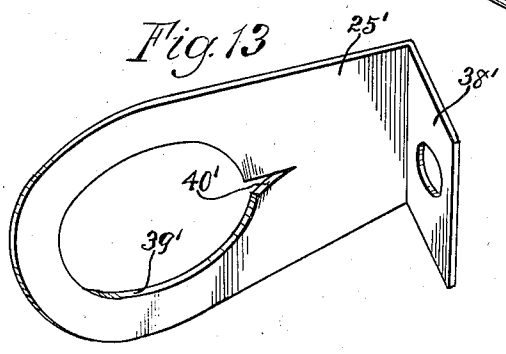


Fig. 13



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UNITED STATES PATENT OFFICE

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AUTOMATIC OIL FEEDING DEVICE FOR METAL WORKING MACHINES

Fenwick L. Ellis, Chicago, Ill.

Application December 11, 1940, Serial No. 369,537

3 Claims. (Cl. 77—55)

This invention relates to new and useful improvements in an automatic oil feeding device for metal working machines.

One of the main objects of this invention is to provide a device or mechanism for automatically feeding oil, at a selected rate of flow, adjacent to the point where the work is being done on the metal working machine, such as a drill press, a lathe, or other metal cutting or working machine, for the purpose of lubricating and to some extent cooling the working tool and the metal worked on.

Another object of this invention is to provide such an automatic oil feeding device which comprises adjustable means whereby the rate of flow of the oil can be closely regulated; so that this device can be set accurately to feed exactly one drop a minute, or even less; and likewise to feed one drop a second, or more if desired.

Another object of this invention is to provide such an oil feeding device which comprises oil containing means and bracket means for supporting it on the machine, all of which is variously adjustable, so that this device is suitable for installation and use on various forms of metal cutting and working machines.

These and various other objects and advantages are attained with this invention, as will become apparent from the following description, taken in connection with the accompanying drawings wherein this invention is shown in some of its preferred forms, it being evident that other arrangements and forms of construction may be resorted to for carrying out the objects and purposes of this invention.

In the drawings:

Fig. 1 is a perspective view of a drill press having the invention applied thereto in its preferred form of construction.

Fig. 2 is an enlarged sectional and elevational view of the bracket means of this invention, taken on line 2—2 of Fig. 1.

Fig. 3 is a detail view of part of this adjustable bracket means.

Fig. 4 is a sectional view of the supporting part of the bracket means holding the oil containing means therein, being taken on line 4—4 of Fig. 2.

Fig. 5 is an enlarged detail sectional view, taken on line 5—5 of Fig. 1, thru part of the oil can.

Fig. 6 is a view of the adjustable element used for regulating the inlet of air to the oil can; and Fig. 7 is a cross-sectional view thereof, taken on line 7—7 of Fig. 6.

Fig. 8 is an enlarged and partly sectional view of the oil feeding means on the end of the oil spout, being provided with the feed regulating means and a shut-off valve thereon.

Figs. 9 and 10 are sectional views, taken respectively, on lines 9—9 and 10—10 of Fig. 8, showing the shut-off valve and the regulating means respectively.

Fig. 11 is a perspective view of the movable tool rest or compound rest of a lathe, having my adjustable bracket means applied thereto and supporting an oil can of a different shape than that of Fig. 1.

Fig. 12 is an elevational view showing this form of oil can on a larger scale as supported by my bracket means.

Fig. 13 is a perspective view of a modified form of can-supporting means for my bracket means.

This invention, as illustrated in the drawings, consists essentially of a device or mechanism arranged for installing on a metal cutting or metal working machine, for the purpose of feeding oil automatically to the point where the work is being done on the machine, and at a selected rate of flow of the oil.

Briefly, this device comprises oil containing means 21 which is equipped with flexible or adjustable oil conducting means 22 including outlet means 23 thereon which is provided with means for regulating the rate of flow of the oil; and this device further comprises bracket means 24 which is provided at one end with supporting means 25 adjustable and adapted to support oil containing means 21 of different sizes, and said bracket means is provided at the other end with securing means 26 for securing the device onto a suitable part of the machine, so that the oil will be fed from the outlet means 23 adjacent to the end of the working tool or the point where the work is being done on the machine.

In the drawings this invention is illustrated in a few of its preferred forms of construction and preferred arrangements and applications to a few of the various kinds of metal cutting and working machines to which it is particularly adapted.

In Fig. 1 of the drawings I have shown this oil feeding device mounted, by the securing means 26 accompanied by spacing washers 27, onto the bracket part 30 of a drill press 31, to extend downwardly therefrom, so that the outer end of the outlet means 23 on the conducting means 22 will feed the oil adjacent to the working end or point 32' of the drill-bit 32; that is, adjacent to the point of work of the tool on the machine; for the purpose of lubricating and to some extent cooling the tool and the metal worked on thereby. Said spacing washers 27 are used to offset the bracket means 24, and to clear the lower rib 33 on the machine bracket 30 and other projecting parts on the machine.

This bracket means 24 is preferably constructed of several similar strap-like parts 34 and 34' which have slots 35 and 35' therein and are adjustably connected by means 36, so that these parts can be arranged at an angle to each

other and the bracket means can also be adjusted for its length; and the supporting means 25 for the containing means 21 is adjustably mounted on said part 34', by means of a bolt 37 engaging in the slot 35'; whereby the position of said supporting means 25 can be properly adjusted on the bracket means, relative to the distance apart from the securing means 26 on the machine and also laterally toward the point of the drill-bit 32.

In its preferred form of construction, as best shown in Fig. 2, the supporting means 25 comprises a U-shaped strap of resilient material, such as spring steel, and it has the bolt 37 extending thru a hole provided in its bight portion and also has a pair of curved outer portions 39 on its two arms, adapted for clasping the containing means 21 therein. A bolt 40 extends thru the arms for adjusting the distance between said portions 39 and suit different sized containing means.

Fig. 13 illustrates a modified form of supporting means 25', which is inexpensive, and it includes a bent end portion 38' provided with an opening therein for receiving the bolt 37 to mount it on the bracket means. It has a round aperture 39' with a slot 40' extending therefrom and having one edge of the metal at the slot bent up from the other edge, to provide a thread for embracing the neck of the oil containing means therein and thus support the same.

The oil containing means 21 in its preferred form of construction, as illustrated in Figs. 1 to 10 of the drawings, comprises an oil can of the usual dome-shaped form and which has its oil conducting means 22 in the shape of a bendable or flexible spout, while the curved portions 39 of the supporting means 25 are clasped around the neck of the can for holding this can in a partly inverted or tilted position, substantially as illustrated. The oil outlet means 23 provided on this spout is equipped with means for regulating the flow of the oil therethru, and this means preferably consists of a small screw 42 which is provided with a cut-away part or groove 43 which is slanted, so that as the screw is threaded into the spout the larger part 43' of the groove extends into the spout, but this groove stops short of the screw head 44, so that the spout can be closed by the screw.

By adjusting this grooved screw 42 in the outlet means 23, the exposed or effective part of the groove can be regulated and likewise closed, and the flow of oil can be regulated, to as slow as one drop per minute or slower, and to as fast as one drop of oil per second or faster. A shut-off valve 45 is preferably also provided in said outlet means 23, for closing the same, so that it will not be necessary to bend up the spout end or to turn the screw 42 to close its groove 43 for stopping the flow of oil, but the adjusting elements can be retained in their desired adjusted positions.

To assure a regular and unvaried flow of oil, especially when the feeding means has been set for a slow rate of flow, means is provided for admitting air into the oil can 21, and, as best shown in Figs. 5 and 6, this comprises a screw 46 which is provided with a flattened portion 47 on its side, and it is threaded in a port 48 which is preferably provided in the bottom 49 of the oil can 21, and is threaded internally for receiving the screw 46. By operating said screw 46 this air inlet in port 48 can thus be opened or closed.

In Figs. 11 and 12 a different form of oil containing means 21' is illustrated, which form is substantially cylindrical and has the oil conducting means or spout 22' extending from its bottom 49', said spout being also equipped with outlet means 23' thereon provided with the grooved screw or flow adjusting means 42' and with the shut-off valve 45', like in the preceding form. Herein the cap or cover 51 which is threaded on the top neck 52 on the can, for closing it, is provided with a small air inlet hole 53 to admit the air into the can, for enhancing a uniform flow of oil therefrom, more particularly when this device has been adjusted for a slow rate of flow.

This form of can or containing means 21' can readily be filled thru its neck 52, without removing the can from its supporting means 25, but may be retained in its operative position for an extended period of time; and it need not be removed for refilling, as does the first described form of oil can 21, which is mounted partly inverted and needs to be refilled thru its neck after removal of its spout 22.

My improved automatic oil feeding device, in its various forms, is adapted for application to and use on various kinds of metal cutting machines; and, as set forth above, the device is shown in Fig. 1 in its preferred form of construction and as installed on a drill press 31. In Fig. 11 the device is shown as there supporting on its bracket means 24 said cylindrical form of oil can 21', and as being installed on a part 54 of the movable tool rest or compound rest 55 of a lathe 56; while the bracket means 24 is mounted on the movable tool rest 55 so that it extends upwardly from said part 54, in order to position the outlet end of oil outlet means 23' so that it will feed the oil, at the selected rate of flow, adjacent to the working end 57' of the cutting tool 57, or where the work is done thereby on the metal article, that is, adjacent to the point of work done on the machine.

I claim:

1. An automatic oil feeding device for a metal working machine, comprising bracket means including means to adjust it for length and means for securing it on the machine, supporting means carried adjustably on the bracket means, oil containing means carried by the supporting means and provided with a flexible spout thereon, flow regulating means adjustably mounted in the outlet end of the spout, air inlet means provided on the containing means, whereby to automatically feed the oil at a selected rate of flow at the point desired on the machine, and shut-off means on the spout to stop the flow of oil.

2. In a device of the class described, an oil container provided with bendable spout means thereon, a member adjustably inserted in the channel in the end of the spout means to regulate the flow of oil therethru, and air-inlet means on the container operable to let in air or to close the inlet.

3. In a device of the class described, an oil can provided with a bendable spout thereon, screw means in the outlet end of the spout and provided with groove means, operable to regulate the flow of oil thru said spout, an air-inlet port on the can provided with an element therein operable to let in air or to close the port, and a shut-off valve in the spout.

FENWICK L. ELLIS.