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WATCHMAKERS' OILER

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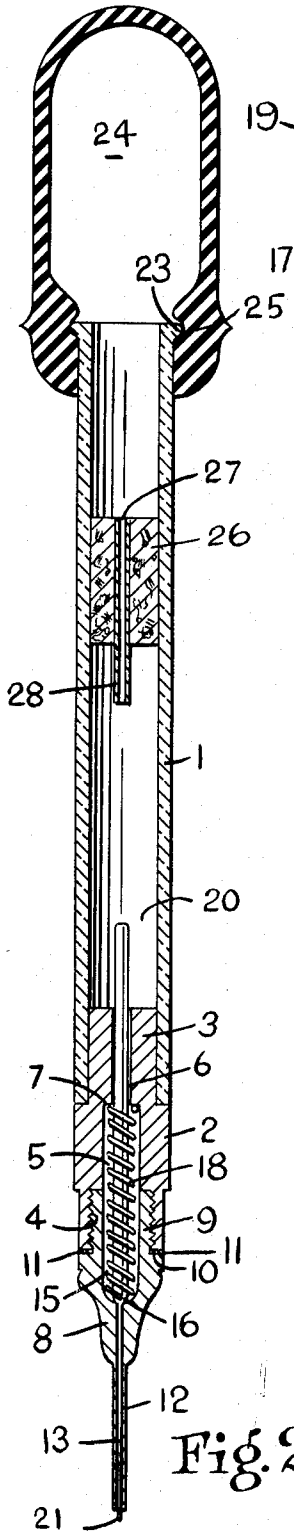


Fig. 2

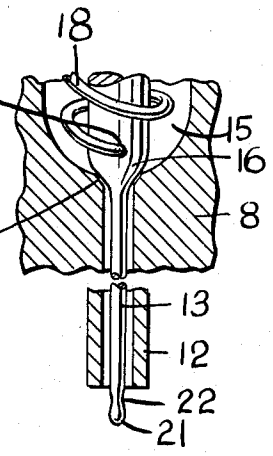


Fig. 3

Fig. 1

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WATCHMAKERS' OILER

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Our invention relates to an oiler for watches, clocks and other delicate or precision instruments.

Conventional watchmakers' oilers consist of a reservoir (which usually is a glass cylinder) and a small-gage metallic tube or "needle" connected to the reservoir. These oilers have many objectionable features. Foremost, is the lack of any convenient control over the rate of feeding of the oil. Another disadvantage is the tendency of the small oil-feed bore to clog due to slow accumulation of foreign matter and/or congealing of the oil. While watchmakers may increase the rate of flow, and sometimes can eliminate a blockage, by blowing into the open end of the reservoir, the effectiveness of this crude operation is very limited. Moreover, such an operation can, and frequently does, result in contamination of the oil with water (from saliva and breath-vapor) or other foreign matter from the mouth of the operator. Since in conventional oilers the flow of oil is not easily controllable, it has been the custom to design them for slow rather than fast feed since a fast flow could not be slowed but a slow feed could be increased by "dipping" or "blowing." (Both of these flow-increasing operations are obviously unsatisfactory, both as to accuracy and as to economy in time and effort.) Thus, the necessarily small feed-bore results in frequent clogging or partial blocking, requiring a bothersome and time-consuming cleaning operation.

Objects of the invention

It is accordingly an object of our invention to provide a watchmaker's oiler from which the flow of oil is easily and accurately controllable.

It is a further object of the invention to provide an oiler which has a means forming part of the oil-flow control that also serves to maintain the oil-feeding bore open or unclogged.

It is another object of our invention to make an oiler which is easy to operate.

It is a further object to provide an oiler which is of such simple construction that it can be easily disassembled and reassembled in cleaning or in replacement of worn parts.

It is a still further object to produce an oiler having the above-mentioned advantages but which is economical as to both durability and cost of manufacture.

Other objects and advantages of our invention will be apparent as the detailed description of our preferred embodiment proceeds.

Figures of the drawing

Fig. 1 is an elevational view of the oiler shown supported vertically in a socket-stand.

Fig. 2 is an enlarged axial cross-sectional view of the oiler.

Fig. 3 is a greatly enlarged partial cross-sectional view of the working tip of the device.

Detailed description

The preferred embodiment of our oiler comprises a

cylinder **1** of glass or other oil-resistant material, but preferably transparent or translucent, whereby the quantity of oil in the reservoir **20** may be readily observed. Connected to the lower end of the cylinder is member **2**, preferably of metal, and provided with a reduced upper tubular portion **3** of a size to fit snugly within the lower end of the glass cylinder **1**, to form a hermetic seal, as by the use of a cemented ground-in, or fused connection, etc. The lower third of the member **2** is provided with an enlarged internally threaded bore **4**, adapted to receive the threaded shank of the oiler tip described below. The member **2** has an axial bore **5** therethrough which narrows abruptly at **6** to form a shoulder or abutment **7** for the spring **18**.

The lower half of the head or working end of the oiler consists of a hollow tip or base member **8** having a cylindrical upper reduced extension **9** externally threaded for mating connection with the threads of bore **4** in member **2**. The shoulder **10**, formed by the reduced cross-section of tip **8** at extension **9**, abuts the lower end of member **2**. Between said lower end of member **2** and the shoulder **10**, may be interposed a washer or gasket **11** of suitable oil-resistant sealing material, such as paper, leather or soft metallic foil. The lower end of tip **8** is formed as, or has attached thereto, a small-gauge tube or needle **12**, extending axially downwardly therefrom for a distance sufficient to make a convenient oil-applying point. The bore through the needle **12** is sufficiently large to receive a very small-guage plunger-rod **13**, which normally extends very slightly beyond the lower end of the needle, as shown in Figure 2. Tip **8** also has an enlarged axial bore **15** of the same size as the bore **5** in member **2**. The push-rod **13** enlarges at **16** to form a valve-member, which preferably, but not necessarily, has a ground-in fit with the valve-seat **17** (see Fig. 3) formed where the bore **15** narrows near its bottom. The plunger-rod **13** continues upwardly through bores **15**, **5**, and **6** and terminates partway into the lower portion of the oil-reservoir **20**. The plunger-rod **13** is normally forced downwardly into the position shown in Figs. 2 and 3 by the compression spring **18** compressed between bore **19** in said rod and shoulder **7** on member **2**. Thus the valve **16—17** is normally closed. The push-rod **13** is made sufficiently smaller than the bores through which it passes so that the lubricating oil will flow freely therepast. At the lower end, the rod **13** is ground to form a rounded work-contacting tip or point **21**, and is further ground immediately above said tip or point to form a narrowed neck-portion **22**, the purpose of which will be explained below.

The upper end of the glass tube **1** is provided with a circular bead or lip **23**, to serve as a retainer for the hollow rubber bulb **24**. Said bulb is provided internally with a groove **25** for mating engagement with the lip **23**.

The reservoir **20** carries a floating piston **26** of cork or other suitable light-weight material. This piston is provided centrally with a breather-passage **27** which is preferably lined by metallic tube **28** extending from the top surface of the piston to a point somewhat below its bottom surface.

The oiler may be supported, as shown in Fig. 1, from a stand comprising a base **30** of wood or plastic, and a vertically and centrally located glass tube **31** of a size to loosely receive the reduced-diameter end of the member **2**. The tube **31** is preferably sealed at its lower end whereby it constitutes a drip-receiving receptacle.

Mode of operation

The oiler may be easily and quickly filled with oil by unscrewing tip **8**, partially collapsing bulb **24**, immersing

the open end of member **2** in oil and then releasing bulb **24**. Expansion of the bulb will create a suction that will cause oil to rise and partially fill reservoir **20**. Tip **8**, carrying the valve mechanism **13—18**, is then tightly screwed back into place. Cork piston **26** prevents flow of oil up into the rubber bulb **24**, which bulb would be damaged by the oil. The downwardly extending end of tube **28** minimizes creepage of oil (by surface tension) from the lower to the upper portion of the reservoir.

When it is desired to lubricate a bearing or other part, the rounded end **21** of rod **13** is gently touched against the same. Generally there is sufficient oil carried on the end **21** to lubricate the part. However, if more oil is needed a gentle pressure downwardly will force rod **13** upwardly relative to the oiler, opening valve **16—17** to permit more oil to enter the bore of the needle. Upon release of the pressure a very slight pumping action occurs as part **16** moves downwardly to reengage valve-seat **17**. The necked-down end **22** of the rod **13** encourages oil-drop formation on the rounded end **21** by discouraging a flow of oil upwardly around the rod **13**.

While the invention has been herein set forth in a specific application thereof, it will be understood that it is subject to modification and accordingly we do not limit ourselves to the exact construction and arrangement shown but may employ such changes in the construction of the parts and in the arrangements as come within the spirit and scope of the appended claims.

We claim:

1. A watchmaker's oiler, comprising: a tubular oil reservoir of translucent material, and of fountain-pen size and shape for convenient manipulation; and a tubular oiler head sealing one end of said reservoir and coaxially extending downwardly therefrom; said oiler head comprising, upper and lower coaxial detachably connected sections, a long thin oiler tube extending coaxially from the lower end of said lower section, said coaxial sections and oiler tube having a continuous substantially straight bore therethru forming an oil conduit from said reservoir and being of enlarged diameter internally of at least one of said sections, a small-gage rod extending loosely thruout substantially the entire extent of said conduit to prevent clogging thereof and normally protruding slightly from the lower end of said oiler tube, said rod being enlarged above the upper end of said oiler tube

to provide a valve portion movable to open position by a work-engaging force against the lower end of said rod, and a coil spring in the enlarged portion of said bore for normally urging said rod to valve-closing position, the upper end of said rod extending at all times into the oil reservoir to prevent clogging of said bore.

2. A watchmaker's oiler according to claim 1 and in which the rod has a smooth, rounded non-scoring end and is reduced in cross-section immediately above its lower or work-engaging end whereby oil-drop formation at said end is facilitated.

3. A watchmaker's oiler comprising: an open-ended tubular oil reservoir of a size and shape to be readily held between the fingers and thumb of an operator's hand, a hollow rubber bulb having a mouth connected to the upper open end of said reservoir, whereby the latter may serve as a pump to fill or empty said reservoir, a small-guage oiler tube connected to the lower end of said reservoir, a light-weight movable piston in said reservoir to prevent free flow of oil between the two portions of said reservoir defined by said piston, whereby damage of said bulb by the oil is prevented, and a breather tube of small gage passing thru said piston, whereby air pressure in said reservoir portions may be equalized without movement of said piston.

4. A watchmaker's oiler according to claim 3 and in which said breather tube extends from a point flush with the upper surface of said piston to a point an appreciable distance below the bottom wall of said piston, whereby flow of oil from the bottom reservoir portion to the top portion is minimized.

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