March 15, 1949. G. W. SUTHERLAND 2,464,730

METHOD OF CLEANING AND LUBRICATING FIREARMS AND OTHER METAL ARTICLES

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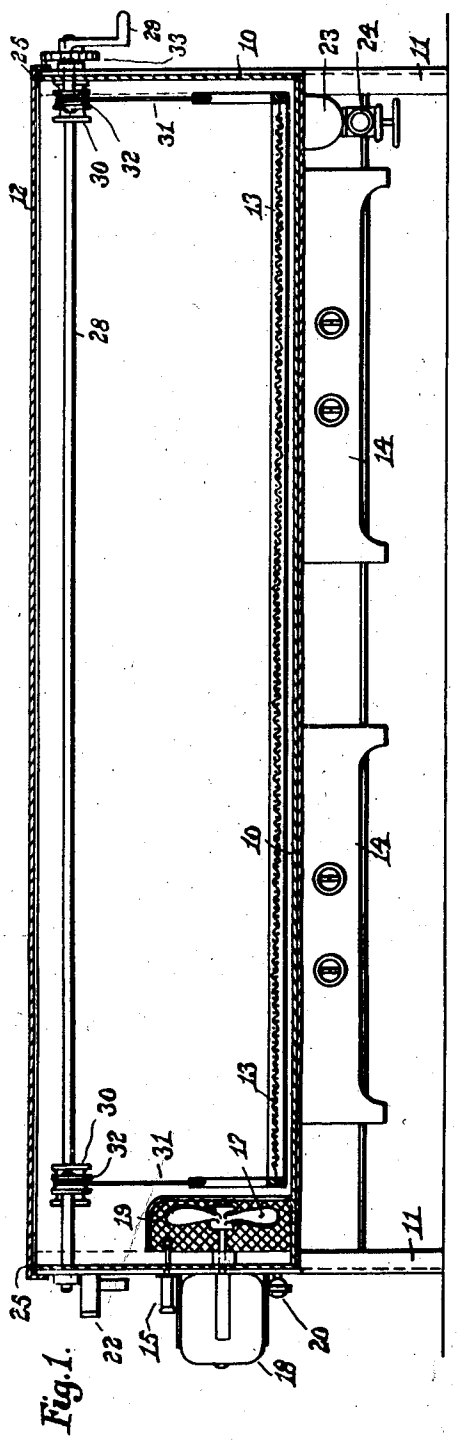


Fig. 1.

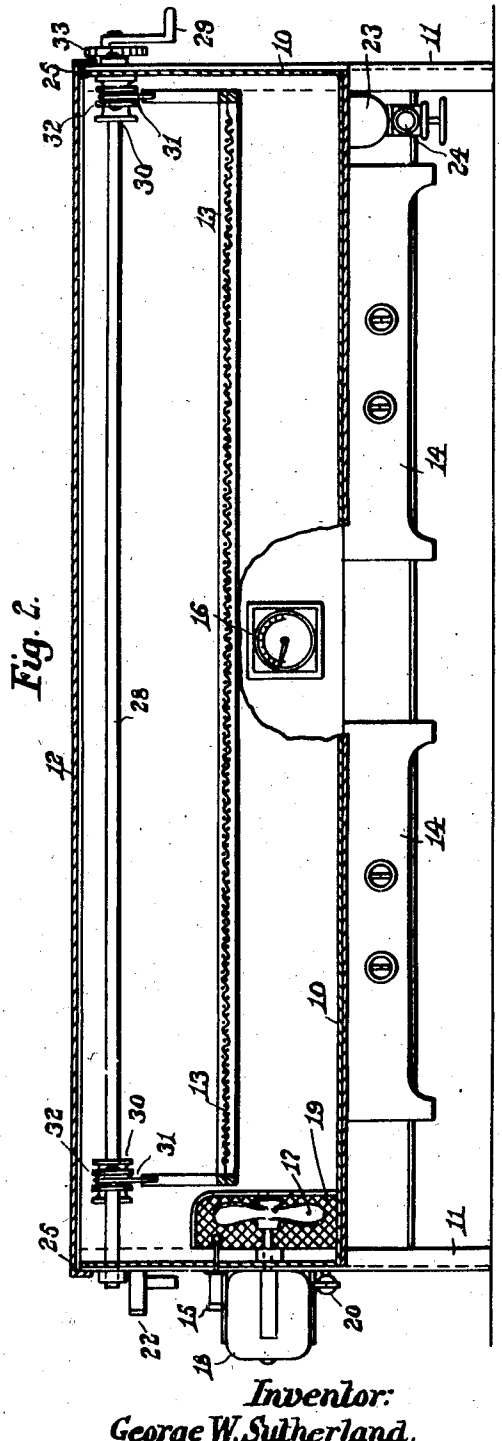


Fig. 2.

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Fig. 4.

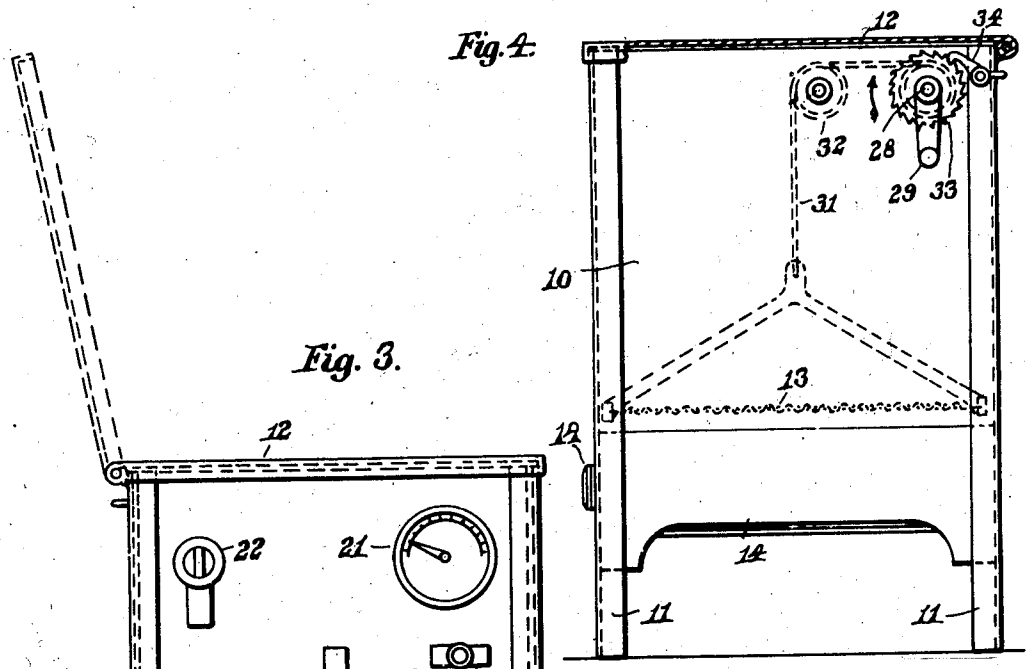


Fig. 3.

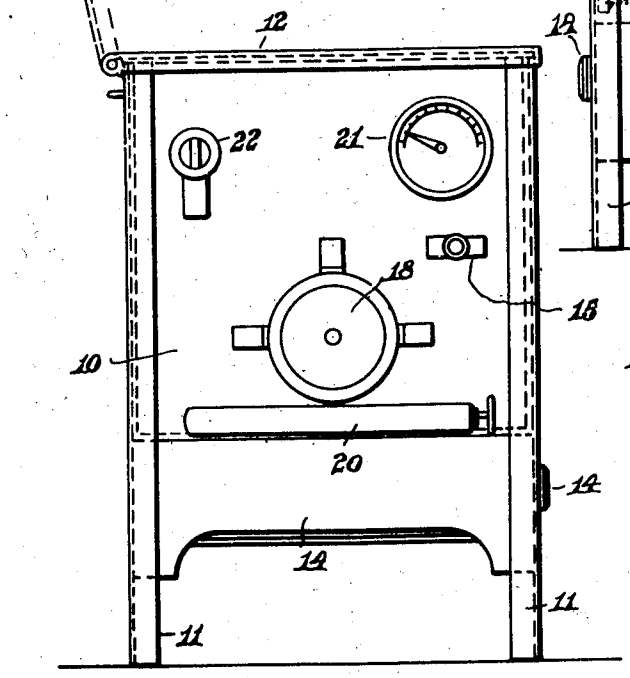


Fig. 7

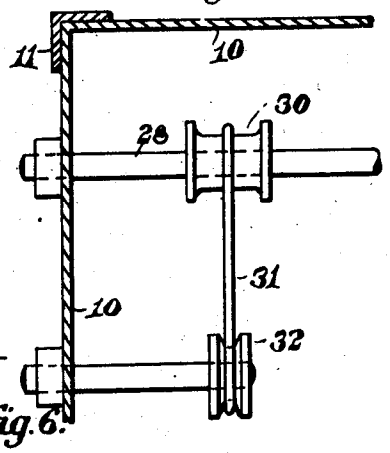


Fig. 5.

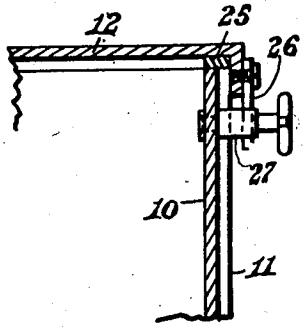
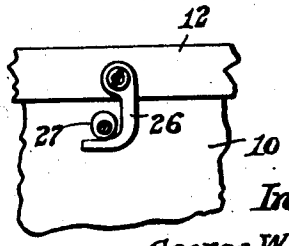


Fig. 6.



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METHOD OF CLEANING AND LUBRICATING FIREARMS AND OTHER METAL ARTICLES

George W. Sutherland, Athol, Mass.

Application April 4, 1942, Serial No. 437,710

1 Claim. (Cl. 134—23)

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This invention relates to method of cleaning and lubricating fire-arms and other metal articles and has for its object the production of an apparatus in which a plurality of metal objects may be simultaneously cleaned and lubricated.

Another object of the invention is the provision of a manually operated mechanism by which the supporting screen may be raised in the tank whenever said cover is raised sufficiently to permit admission of air to said tank.

A further object of the invention is the provision of means whereby the oil in the tank may be heated to a desired temperature and the actual temperature of the oil indicated by a suitable device for this purpose.

A still further object of the invention is the provision at one end of the tank of an air pump, an air gauge, and a relief vent, these devices combining to regulate the pressure of the air within said tank.

These objects are all attained by the mechanism illustrated in the accompanying drawings.

The invention consists of an air tight oil tank in which the articles to be cleaned may be deposited during the cleaning operation, said tank having associated therein means for heating the oil in said tank and a motor-driven fan for agitating the oil in which the articles to be cleaned are supported on a wire screen adapted to be raised or lowered as desired.

For the purpose of illustrating the invention, one preferred form thereof is shown in the drawings, this form having been found to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized, and the invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described except as required by the scope of the appended claim.

Of the drawings:

Figure 1 represents a vertical longitudinal section of an apparatus embodying the principles of the present invention with its elevator in its lowest position.

Figure 2 represents a similar section with the elevator in its raised position.

Figure 3 represents an elevation of the left end of said apparatus.

Figure 4 represents an elevation of the right end thereof.

Figures 5 and 6 represent details of the means for locking the cover to the tank to make the latter airtight, and

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Figure 7 represents a horizontal section of a corner of the tank and showing means for raising the elevator by the means of a rotatable shaft.

Similar characters indicate like parts throughout the several figures of the drawings.

In the drawings, 10 is a rectangular galvanized tank adapted to contain a cleansing oil or solvent and having at each corner thereof a supporting leg 11.

The top of said tank 10 has hinged thereto a lid or cover 12 and beneath said lid 12 is a perforated elevator 13 preferably formed of wire screen.

Normally the elevator 13 is slightly above the bottom of the tank 10 and when the lid 12 is partially raised the elevator 13 will be raised to the top of said tank above the oil contained therein.

Beneath the bottom of tank 10 are disposed two double standard heating units 14 and these units are controlled by a thermostat 15 on one end of the tank 10. A thermometer 16, Fig. 2, is attached to the side of the tank 10 where it indicates the temperature of the oil bath.

Within the tank 10 is a bladed fan 17 driven by a motor 18 secured to an end wall of the tank 10 and this fan 17 is enclosed in a wire screen casing 19.

During the rotation of the fan 17 the oil in the tank is thoroughly agitated and forced toward the opposite end of the tank.

Beneath the motor 18 and secured to the end wall of the tank 10 is an air pump 20 by which air may be forced into the oil in the tank and thereby increase the pressure thereof in order to secure better penetration.

The width of the elevator 13 is sufficient to support six Springfield rifles, all of which may be cleaned at the same time.

When the apparatus is in use ten gallons of oil are put into the tank and then this oil is heated to 190° F.

The firearms or other articles to be cleaned are then placed on the elevator 13 and submerged in the hot oil, remaining in the oil for thirty minutes, during which time the oil temperature will reach 200° F.

At the conclusion of this thirty minutes treatment the elevator or screen 13 will be raised just above the surface of the oil.

When in this raised position the firearms will steam in the oil vapor and gradually cool and dry, the lid 12 at this time, being raised enough

to permit a sufficient amount of cool air to enter the upper portion of the tank.

The firearms are then removed from the tank and transferred to suitable gun racks where they will drain toward the muzzles thereof. These gun racks may be of any well known construction.

When there is heavy corrosion on the firearms it is sometimes necessary to repeat the operation.

During this oil treatment the pores of the steel will open and absorb the oil and thus force powder residue and other particles out of the metal. Simultaneously with this action, any water occluded in the metal, or in the stocks and other parts of the firearms, will be expelled, and these actions, together with the fact that the expansion of the metal is greater than that of any scale, rust, or other deposit which may adhere to it, assists in throwing off all this foreign material. Later, when the parts cool, oil still retained on the surfaces is forced into the microscopic pores and cells of the metal by the partial vacuum created in those pores and cells, due to the reduction in temperature, combined with the pressure of the surrounding atmosphere.

When the firearms are drained, a light film of oil remains on both the inner and outer surfaces of the firearms, thus protecting the weapons when in storage against any atmospheric change.

If the weapon is to be used at once it is only necessary to remove the excess oil from the outer surface of the firearm.

The bore of the weapon and its firing mechanism should not be touched.

When firearms are subjected to this oil bath the treatment will also preserve the gun stocks.

A pressure gauge 21 is mounted on one end of the tank 10 by which the pressure of the air within the tank may be determined at any time and for safety a relief valve 22 is also mounted on the end wall of the tank.

When a firearm has been discharged a number of times and has become foul, usually it has been necessary to clean the bore with a powder patch soaked in a solvent.

When the patch is removed it will be noticed that powder residue adheres to the patch.

If a firearm is treated to the oil bath as described and then cleaned with a fresh powder patch, it will be found that not only powder residue but also particles of metal fouling are on the patch, while at the same time the bore of the firearm will be perfectly clean, free from particles and coated with a thin film of oil.

Because the firearm is clean and covered with a thin oil film, it can be stored with the assurance that it will be protected against rust and corrosion.

The tank 10 is provided near one end thereof with a filter cup 23 and a drain cock 24. By opening the cock 24, the oil may be drained from the tank.

The filter cup 23 will trap all dirt residue, metal fouling and all foreign particles while through the drain cock 24 on the bottom of the filter cup the tank may be drained.

The lid or cover 12 is equipped with a gasket 25 and eccentric coacting clamping devices 26, 27 on said lid or cover 12 and the wall of the tank

thus providing a means for making the tank air tight when said cover is closed.

By means of this apparatus a plurality of firearms may be thoroughly cleaned at the same time.

A thin high-grade oil free from acid is used during the cleaning operation.

The process can be successfully used to clean machine guns, rifles, shotguns, pistols, revolvers and also tools and small parts of motors.

In the tank 10 and near the rear wall thereof is a revoluble shaft 28 adapted to be rotated by means of a crank 29 and said shaft 28 is provided with two drums 30 on which may be wound chains 31, the lower ends of which are connected to the opposite ends of the elevator 13, said chains passing over revoluble grooved pulleys 32.

The shaft 28 is also provided with a ratchet 33 and coacting with said ratchet is a spring pressed pawl 34 adapted to prevent the lowering of the elevator 13 when in any desired raised position.

It is believed that the operation and many advantages of the invention will be thoroughly understood without further description.

Having thus described my invention, I claim:

The method of cleaning firearms consisting of submerging the same in an enclosed oil bath at a temperature of 190° F.; forcing said oil lengthwise of the enclosure; retaining the firearms in said bath for about thirty minutes while the oil is being agitated and its temperature is being raised to 200° F.; increasing the pressure on the enclosed oil; then raising the firearms above the oil bath and steaming the firearms in the oil vapor; and allowing the firearms to cool and drain.

GEORGE W. SUTHERLAND.

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