

No. 827,518.

PATENTED JULY 31, 1906.

E. A. EMERY.  
LUBRICATOR FOR PNEUMATIC MACHINERY.  
APPLICATION FILED MAY 28, 1902. RENEWED MAY 19, 1906.

Fig. 1.

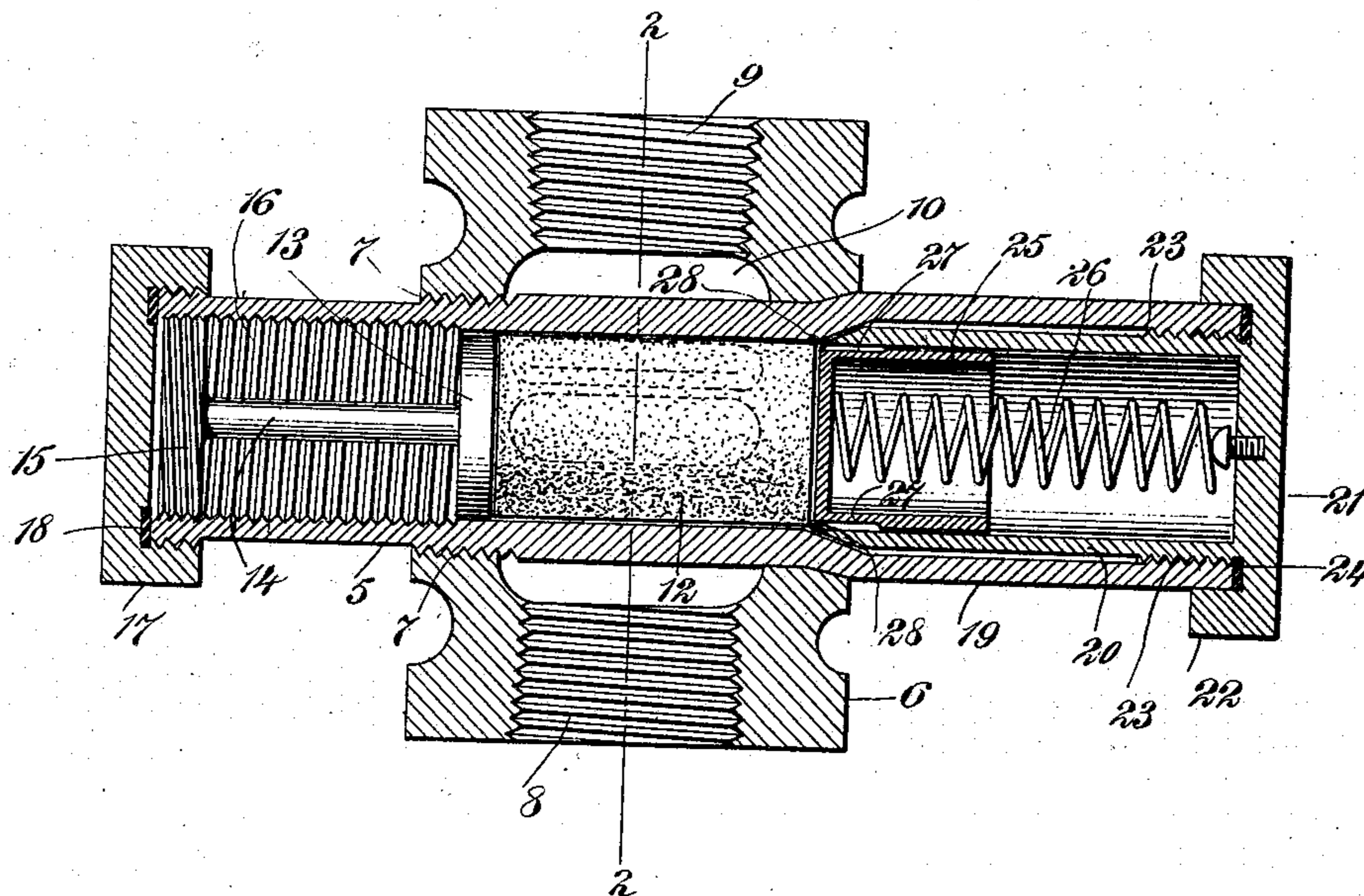
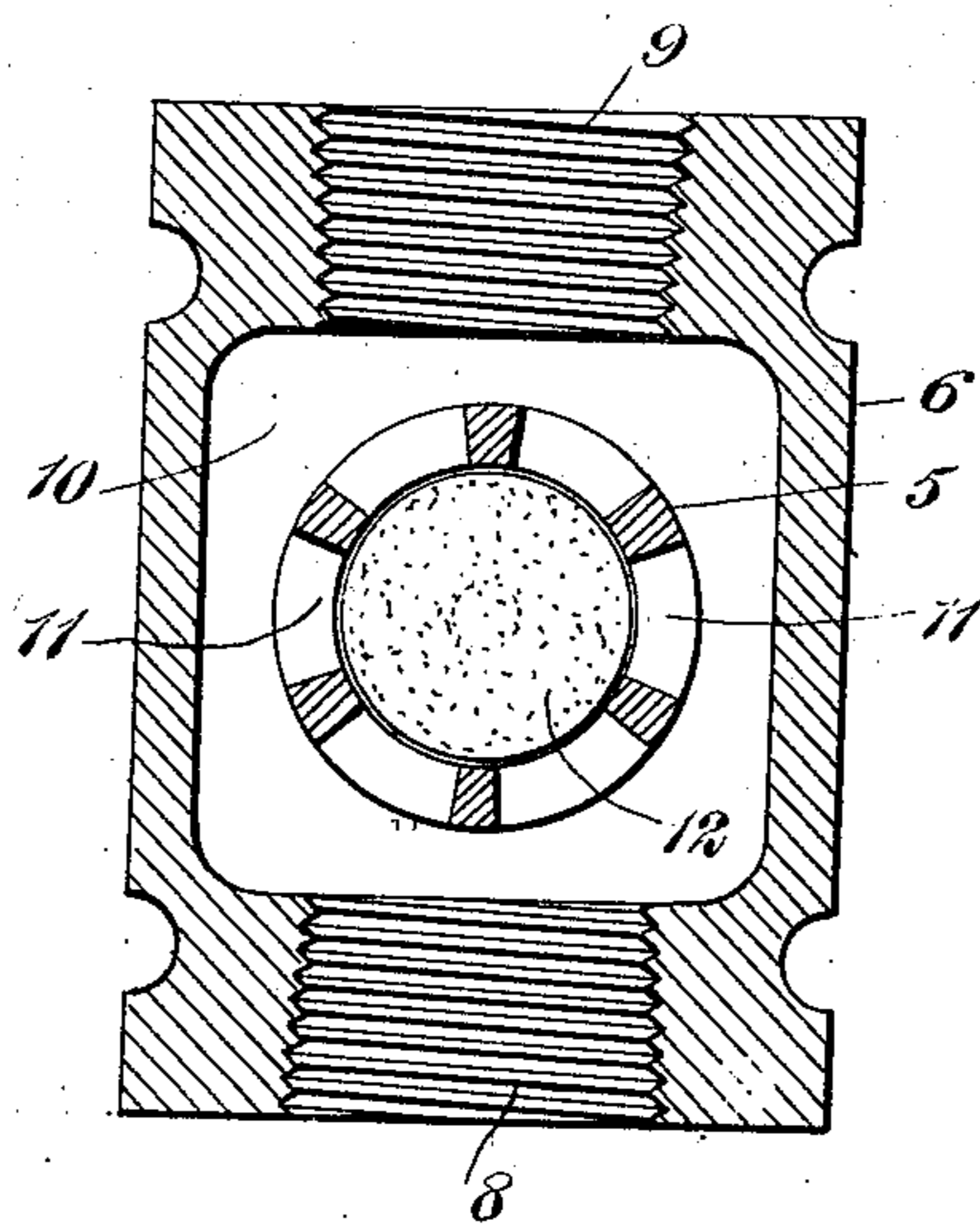


Fig. 2.



WITNESSES:

William P. Goebel.  
H. J. Berkhong

INVENTOR

Edwin A. Emery

BY

Mumford  
ATTORNEYS

# UNITED STATES PATENT OFFICE.

EDWIN ARD. EMERY, OF CRIPPLE CREEK, COLORADO, ASSIGNOR TO THE  
EMERY PNEUMATIC LUBRICATOR COMPANY.

## LUBRICATOR FOR PNEUMATIC MACHINERY.

No. 827,518.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed May 28, 1902. Renewed May 19, 1906. Serial No. 317,794.

*To all whom it may concern:*

Be it known that I, EDWIN ARD. EMERY, a citizen of the United States, and a resident of Cripple Creek, in the county of Teller and State of Colorado, have invented new and useful Improvements in Lubricators for Pneumatic Machinery, of which the following is a full, clear, and exact description.

My invention relates to improvements in lubricators especially designed for use in machinery of different kinds depending upon compressed air as the motive power—such, for example, as air-drills, coal-cutters, air-hoists, and mining machinery—although I do not desire to strictly confine myself to the described application of the lubricator to a particular class of machinery.

In the present invention I employ a construction adapted to contain a "cartridge" or charge of solidified oil or grease treated to make it soluble when attacked by moisture, and around or adjacent to this cartridge the motive fluid is caused to circulate, so that the cartridge is caused to dissolve by its affinity for the moisture contained in the motive fluid, whereby the lubricant is taken up by the current of the motive fluid and carried into the machine or the parts it is desired to lubricate.

It is well known that pneumatic machinery requires lubrication in proportion to the moisture in the air, and the present invention is designed to automatically meet these requirements. The lubricator is so constructed that its method of use on mining and other pneumatic machinery renders it peculiarly free from accidental damage resulting from rough or careless handling. The action of the dissolved compound is cleaning in effect and thoroughly overcomes the accumulation of grit, thus increasing the serviceability of the apparatus and making it, to a great extent, independent of the care of the operator. When used in connection with a throttle or plug-cock, the device supplies the lubricant to the air as it passes to the machine, and some of the lubricant is deposited in the cock to render the latter easy and free in operation.

One of the marked features of my device is the economy secured in the quantity of lubricant utilized for the proper oiling of machinery, and this is due to the fact that the cartridge is dissolved only when the machine is in service and the air is circulating around

said cartridge. The estimated cost of lubrication, compared to the present liquid method of lubrication, is about ten per cent. A cartridge or charge about one inch in diameter and two inches long will, it is estimated, last from six to twelve hours, according to the dryness of the air.

My improved device also embodies means by which a cartridge may be easily and quickly placed in position, and also includes adjustable devices adapted to vary the area of the cartridge exposed to the disintegrating influences of the air-current, thus making provision for regulating the supply of the lubricant to the working parts.

With these ends in view the invention consists of a lubricator embodying novel features of construction and arrangement of parts, which will be hereinafter fully described, and the actual scope of the invention will be defined by the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both the figures.

Figure 1 is a vertical longitudinal sectional elevation through the lubricator embodying my invention and showing a solid cartridge or charge of lubricant in position therein; and Fig. 2 is a vertical transverse section in the plane of the dotted line 2 2 of Fig. 1.

In carrying my invention into practice, I provide a casing which is constructed with a chamber for the reception of a solidified charge or cartridge of lubricant, said casing having means for the circulation of a motive fluid through the same and adapted to house the several working parts for holding the charge or cartridge in an exposed position.

In the preferred embodiment of the invention shown by the drawings the cartridge container is represented in the form of an elongated shell 5, and to this shell is united a casing 6 by means of the screw-threaded joint 7, said casing 6 being provided with the female-threaded sockets 8, 9, which are adapted for the attachment of pipes (not shown) suitable for conveying the motive fluid to and from the lubricator, as will be readily understood. The casing 6 is provided with a circulating-chamber 10, which may take the form shown more clearly by Fig. 2; and through this casing extends the cartridge-

containing shell 5. The shell is shown by the drawings in the form of an elongated cylinder; but the particular shape is not material. The length of the shell greatly exceeds the diameter of the casing, and said shell has its end portions extended or projected from opposite sides of the casing, thereby exposing the end portions of the shell to convenient access and making it possible to adjust the regulating devices without disturbing the connection of the lubricator to the circulating pipes. The shell 5, which extends through the circulating-chamber 10 of the casing, is provided with a series of radial slots or openings 11, the same terminating within the limits of the chamber and adapted to expose the cartridge to the disintegrating influence of the current of motive fluid, the latter circulating through the chamber 10 and having access to a large area of the cartridge, owing to the presence of the slots or openings 11 in the cartridge-containing shell.

As hereinbefore described, the cartridge is made of oil and grease or any suitable lubricating matter, which is treated to reduce it to a solid condition, such treatment being effected chemically in order to render the cartridge soluble when attacked by moisture. This cartridge is indicated at 12 and is fitted or contained within the slotted part of the shell 5, thus exposing the cartridge to the circulating motive fluid traversing the chamber 10 of the lubricator.

The shell 5 is adapted to contain adjustable means affording an abutment for one of the solidified cartridges, and this adjustable means is embodied in the form of a head or disk 13, which is provided with a stem 14, the latter being attached in a suitable way to a threaded disk 15. Said disk has a circumferential male thread adapted to engage with the interiorly-threaded portion 16 of the cartridge-containing shell 5 at one portion thereof, and this end of the shell is closed by means of a cap 17, the latter being preferably screwed to said end portion of the shell and receiving a packing or gasket 18, of suitable material. The cap may be screwed to the shell in order to compress the gasket, and thereby make a tight joint between the cap and the shell, which joint obviates the leakage of the motive fluid through the shell. The other projecting portion of the cartridge-containing shell is enlarged or expanded somewhat, as indicated at 19, and within this expanded portion is fitted an internal sleeve 20, the latter extending lengthwise. Said projecting portion of the sleeve is provided at its outer extremity with a head or cap 21, the same being flanged at 22 and adapted to circumferentially embrace the end portion of said shell. This sleeve is provided near the head or cap with a male thread at 23, and it is screwed into a female thread provided at the outer end of said projecting

portion of the casing, thus enabling the sleeve and the cap to be screwed into the expanded portion of the casing. A tight joint is secured between the cap and sleeve and the casing by interposing a gasket or packing 24 between the end edge of the casing and the interior face of the cap. Within this capped sleeve, which is thus removably fitted in the end portion of the shell opposite to the regulating device, is housed or contained a movable or yieldable plunger 25, the latter being adapted to engage with one end portion of the cartridge 12 and cooperating with the adjustable head 13 in a manner to confine and hold the cartridge against displacement within the shell. This plunger 25 is preferably chambered in order that it may receive one end portion of a pressure-spring 26, the latter being contained in the sleeve 20 and having its other end seated against the cap 21. The spring is normally effective in forcing the plunger into engagement with the cartridge, and this plunger and the spring are removable and insertible with the sleeve 20.

The displacement of the plunger from the sleeve on removal of the parts from the cartridge-containing shell is prevented by suitable stop devices, and in Fig. 1 the plunger is shown as having its inner end portion reduced in diameter, as at 27, said reduced portion of the plunger facing one end of the charge or cartridge 12. The inner extremity of the opening in the insertible sleeve 20 is contracted in diameter, as at 28, in order to confine the spring-pressed plunger against separation from the sleeve 20 on the withdrawal of the parts from the casing. The contraction of the sleeve at 28 is secured by crimping or bending it in any suitable way. The diameter of the lubricant cartridge 12 is such that it fits slack or loose in the sleeve, allowing ample room for the cartridge to pass into the contracted end of the sleeve when required.

In using my improved lubricator the circulating pipes are attached to the threaded portions 8 9 of the casing, and after the sleeve 20 and its parts shall have been removed from one end portion of the shell 5 a solid cartridge or charge 12 may be placed in the slotted portion 11 of said shell 5. The head 15 is now screwed into the threaded part 16 of the shell in order to properly position the abutment or head 13, against which bears one end of the cartridge, and the cap or head 17 is then screwed on said end portion of the shell. The sleeve 20 is now screwed into the other end portion of the shell in order to properly compress the gasket 24, and this adjustment of the sleeve brings the spring-actuated plunger into engagement with the other end of the cartridge.

It will be seen that the adjustable head and the yieldable plunger afford a convenient means for regulating the area of the cartridge

which is exposed to the circulation of air, and the cartridge is thus also clamped and held in proper position within the shell.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A lubricator for pneumatic machinery having an air-circulating passage and an outlet adapted for connection with the device to be lubricated, a lubricant-chamber extending into said air-passage, and movable devices disposed in coöperative relation to each other and to such lubricant-chamber to confine a solid lubricant charge in the path of air adapted to circulate through the chamber.

2. A lubricator having an air-circulating passage, an insertible cartridge-container, and a follower movable toward said passage.

3. A lubricator having means for holding a lubricant cartridge therein, an air-circulating passage, and a follower movable normally toward said passage.

4. A lubricator having a circulating-passage, an insertible cartridge-container, and coöperating holding devices, one of which is normally movable toward said circulating-passage.

5. A lubricator having means for holding a lubricant charge therein and an air-outlet adapted for connection with a device to be lubricated, an air-circulating passage adjacent to said charge, and a spring-actuated follower movable normally toward said passage.

6. A lubricator for pneumatic machinery having a body provided with air inlet and outlet connections, one of which is adapted for communication with the device to be lubricated, an air-circulating passage between said connections, a cartridge-container for holding a charge of solid lubricant in the path of air circulating through said passage, and followers carried by said container and disposed in opposing relation to each other.

7. A lubricator having a circulating-chamber, a cartridge-container disposed therein, an adjustable abutment within said container, and a yieldable follower or plunger also housed in the container and coöperating with said abutment.

8. A lubricator having a circulating-chamber, an interiorly-threaded cartridge-container fitted in said chamber, means for closing the ends of said container, an abutment slidably fitted in the container and having a part screwed into said threaded part of the container, and a follower coöperating with said abutment.

9. A lubricator having a circulating-chamber, a cartridge-container within said chamber and provided with an adjustable abutment, and a sleeve secured within the container and provided with a yieldable follower or plunger.

10. A lubricator provided with a circulating-chamber, a cartridge-container therein, a

sleeve removably fitted in said cartridge-container, a plunger confined in said sleeve, and means for impelling said plunger; the plunger and its impelling means being insertible and withdrawable with said sleeve into and from the cartridge-container.

11. A lubricator for pneumatic machinery, having a lubricant-chamber and a passage for the circulation of a compressed current of air, and a movable feed device arranged to move a solid charge of inert lubricant into the path of such compressed current of air, said solid lubricant being exposed to the disintegrating action of the moisture present in the compressed air-current.

12. A lubricator for pneumatic machinery having a passage for the circulation of a compressed-air current, a lubricant-chamber in communication with said passage, and a solid charge of lubricant exposed to dissolution by the moisture present in the air-current, whereby the lubricant remains in an undissolved state on the cessation of the air-current and is dissolved by the moisture of said air-current only when the latter traverses the lubricator.

13. A lubricator for pneumatic machinery having an air-circulating passage, a container insertible in said passage and movable followers mounted in said container for insertion and removal therewith and disposed in coöperative relation to each other.

14. In a lubricator for pneumatic machinery, a slotted or perforated cartridge-container provided with movable followers disposed in coöperative relation to each other.

15. In a lubricator for pneumatic machinery, a cartridge-container provided with circulating slots or openings in communication with an air-circulating chamber, and movable followers arranged to traverse said cartridge-container.

16. A lubricator for pneumatic machinery, having a passage for the circulation of a compressed current of air, and coöperating feed devices disposed in opposing relation for presenting a charge of solid lubricant in a position for access by the air-current, said lubricant being disintegrated by the moisture present in such current of compressed air.

17. In a lubricator, the combination with a casing having means for the circulation of air therethrough, of a cartridge-container insertible in said casing and provided with a movable follower.

18. A lubricator having a casing provided with a passage for the circulation of air, a cartridge-container insertible in said casing, and a spring-actuated follower slidably confined in said cartridge-container and removable therewith from the casing.

19. A lubricator for pneumatic machinery having a passage through which air may be circulated, and a cartridge-container for lubricant projecting into the path of the air

circulating through such passage, said cartridge-container being perforated to expose a cartridge contained therein to the action of the air circulated through the passage.

5 20. A lubricator for pneumatic machinery having an air-circulating passage, a cartridge-container extending entirely across said passage and supported at the opposite sides thereof and having an opening or openings  
10 whereby to expose a cartridge in said container to the action of air circulated through the passage.

21. A lubricator comprising a casing having means for connection of inlet and outlet

pipes, and a container for a lubricating-cartridge, said container extending transversely within the casing and having an opening or openings through which a contained cartridge may be exposed to the action of air circulated through the casing. 15 20

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWIN ARD. EMERY.

Witnesses:

A. W. GRANT,  
W. J. PORTIS.