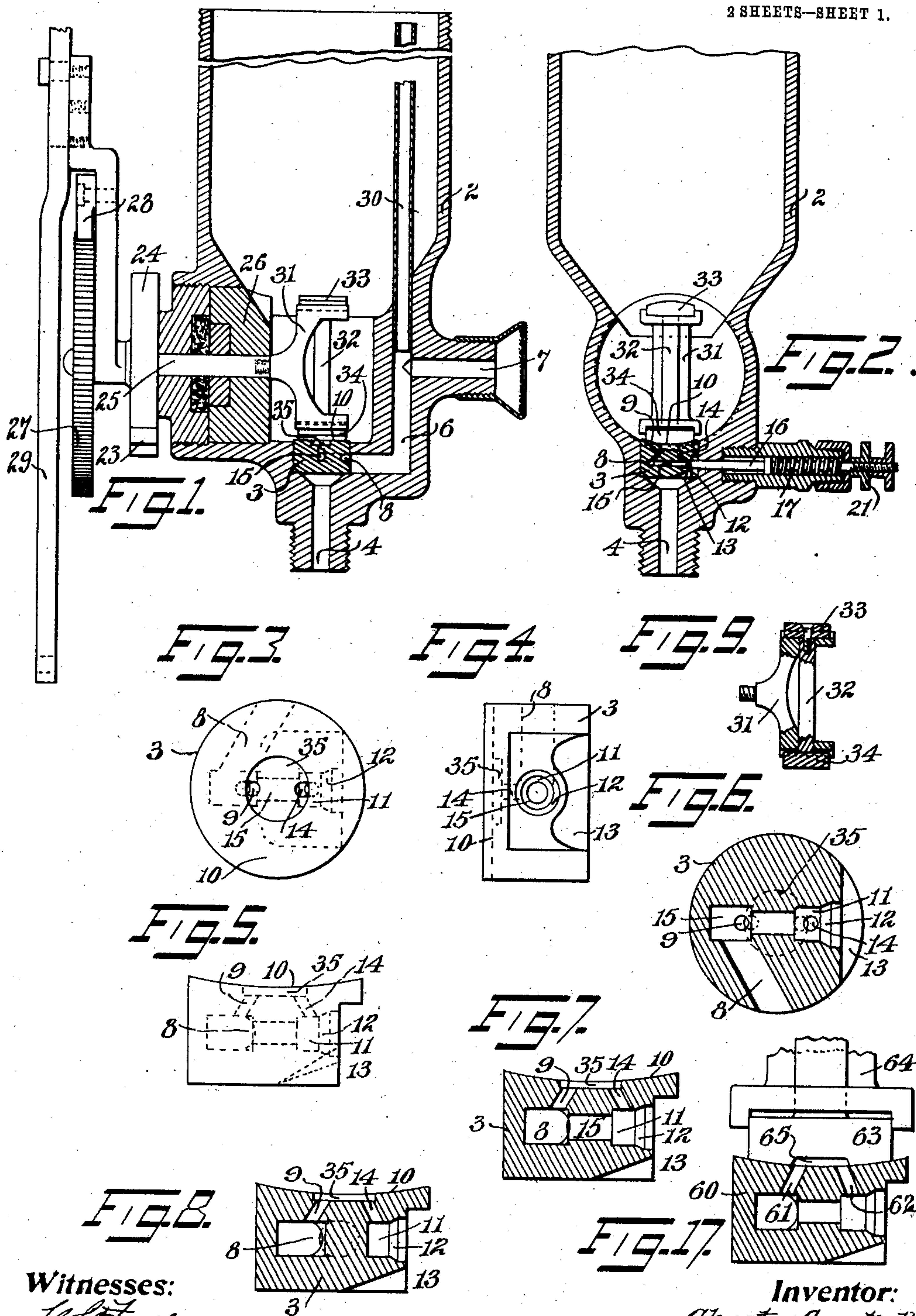


C. COMSTOCK.
LUBRICATOR FOR GRAPHITE.
APPLICATION FILED JULY 3, 1908.

919.322.

Patented Apr. 27, 1909.

2 SHEETS—SHEET 1.



Witnesses:

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H. D. Penning

Inventor:

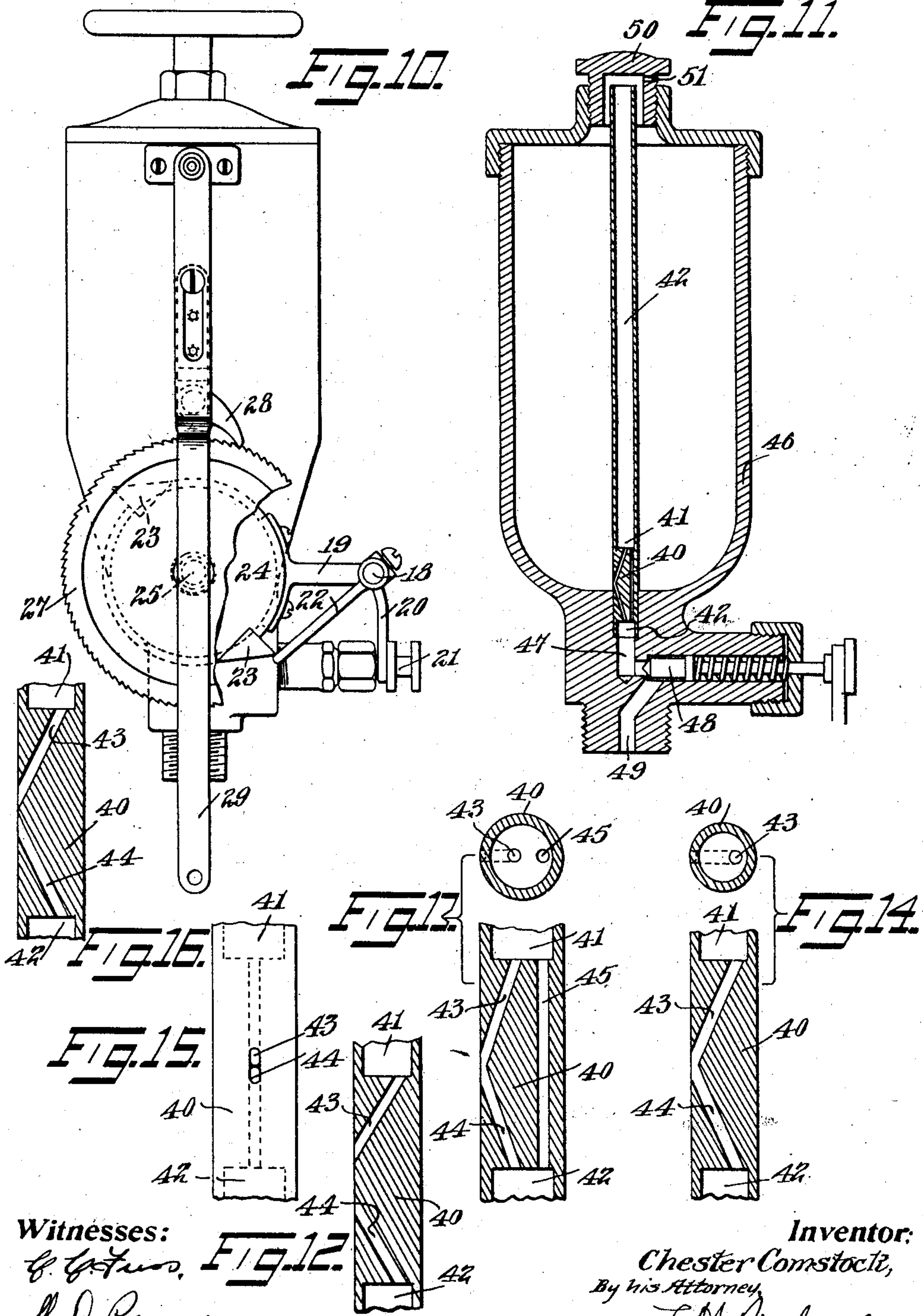
Chester Comstock,
By his Attorney,
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

CHESTER COMSTOCK, OF RIDGEWOOD, NEW JERSEY.

LUBRICATOR FOR GRAPHITE.

No. 919,322.

Specification of Letters Patent.

Patented April 27, 1909.

Application filed July 3, 1908. Serial No. 441,757.

To all whom it may concern:

Be it known that I, CHESTER COMSTOCK, a citizen of the United States, residing in Ridgewood, New Jersey, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Lubricators for Graphite, of which the following is a specification.

This invention relates to lubricators especially designed to feed material in a comminuted or pulverulent condition, such for instance as graphite or pulverized mica; and has for its object an improved form of such device that will feed a small quantity of such material at regular intervals, and without the use of considerable pressure.

In the accompanying drawing representing embodiments of my invention, Figure 1 is a vertical section through one form of the device. Fig. 2 is a partial section taken at right angles to the view shown in Fig. 1. Figs. 3, 4 and 5 are different elevations of the apertured member in the receptacle. Fig. 6 is a horizontal section, and Fig. 7 a vertical section of the same. Fig. 8 shows the latter member in modified form. Fig. 9 is a view of the valve member detached. Fig. 10 is an elevational view of the lubricator. Fig. 11 is a vertical sectional view of a modification of the lubricator. Figs. 12 to 16 show forms of the feed member used in the modification; and Fig. 17 shows another form of valve.

The invention is shown as comprising a receptacle having in its lower portion, or in its bottom, a feed member. The receptacle is provided with an outlet passage and also with an inlet passage, arranged at or in proximity to the said feed member. And the feed member is provided with an inlet passage and also an outlet passage, and also with two passages, one leading from the inlet to the outer face of the feed member exposed to the contents of the receptacle, and a second passage opening into the outlet, and having its other end in the face of the feed member, and in more or less proximity to the end of the other passage in the face of the feed member. These passages are preferably inclined to each other and may extend in opposite directions from their said ends in the face of the feed member, and are also preferably of smaller size than the said inlet and outlet passages. And it may also be desirable to arrange another passage in the feed member connecting the inlet passage with the outlet passage directly, which passage is

also preferably relatively smaller than the passages it connects. The feed member may also be provided with a recess portion including the two said adjacent ends of the passages in the face of the feed member.

In the construction shown in Figs. 1-8 is a receptacle 2 having in its lower portion a feed member 3, somewhat in the form of a plug set in the bottom of the receptacle in a suitable opening. Below this plug is an outlet 4 that is closed from the receptacle by the feed member 3. An inlet in the form of a passage 6 in the receptacle is provided that may be open to the atmosphere at 7, or if desired may be connected to any suitable source of pressure. The feed member 3 connects with the inlet passage 6 by a passage 8 therein, and a reduced passage 9 in the feed member connects with the outer face 10 of the feed member that is exposed to the contents of the receptacle 2. The feed member 3 connects with the outlet 4 by passage 11, formed by a bore in the member as shown in Figs. 6 and 8, having a valve seat 12 therein; and the feed member is cut away at 13 thereby connecting the bore 11 with the outlet 4. A reduced passage 14 connects the outlet 11 with the outer face 10 of the feed member and is thereby exposed to the lubricant in the receptacle. It will be observed that the ends of the reduced passages 14 and 9' are in proximity, and also that they extend in opposite directions from the receptacle. In Fig. 8 there is no passage connecting the inlet 8 with the outlet 11, but in Figs. 3-7 these two passages are connected by a bore 15 that is practically a continuation of the bore 11 meeting the inlet passage 8 in the feed member.

In order to control the flow of graphite from the receptacle through the feed member and out of the outlet 4, an outlet valve is provided; and a pin valve 16 is shown as engaging the valve seat 12 of the bore 11, and is normally held closed by a spring 17. Suitable means may be provided for opening this valve at certain intervals. A short shaft 18 (Fig. 10) carried by a suitable bracket 19, has an arm 20 engaging the outer end 21 of the valve to open the valve when swung; and a second arm 22 on the shaft 18 is engaged by one or more lugs 23 fast on a disk 24 that rotates on shaft 25, carried in a bearing portion 26 of the receptacle. Shaft 25 is shown as provided with a ratchet wheel 27 engaged by pawl 28 that is pivoted on a swinging lever 29. When the lever is oscil-

lated the ratchet wheel is advanced, and will intermittently rotate the disk carrying the lugs 23. At suitable periods in its rotation, the lugs will swing the arm 22 and by their bevel form will trip the valve 16, thereby opening the outlet of the feed member for a short period of time. In this form of lubricator, the inlet passage 6 also connects with the receptacle by a tube 30 opening into the upper end of the receptacle and serving to equalize the pressure on the lubricant therein, and tending to force it downward to the feed member. In the construction described, there is also shown means for closing the exposed ends of the two passages in the feed member to the contents of the receptacle for certain periods of time, yet providing communication between the two said ends. This is effected by a valve member that is operated in connection with the outlet member whereby the outlet is normally closed by its valve, and the valve is opened at the outlet only for a short period of time while the other valve closes communication between the said ends of the passages in the feed member and the contents of the receptacle. The shaft 25 is shown as projecting into the receptacle and provided with a head 31 in the form of a cross arm. A stem 32 slides in openings in the cross arm and has a diametrical position relative to shaft 25. The outer extremities of this stem 32 carry valves 33 and 34, which valve member has a slight endwise movement. The valve members 33 and 34 on rotation of the shaft will alternately sweep across the exposed face of the feed member 3 that is preferably curved cylindrically to engage the correspondingly shaped faces of the valves. This slight endwise movement of the valve stem will give a little play to the valves as they wipe across the feed member, and they will fall by their own weight and press against the feed member, also assisted by the pressure in the receptacle through the inlet by tube 30. Means are also provided whereby communication between the two passage ends is not closed by the valve member. In the construction illustrated in Fig. 7 a comparatively shallow recess 35 is provided in the feed member, into which the said passages 9 and 14 lead. The valve will cover this recess as it sweeps past but the recess will still connect the two passages. For each revolution of the shaft 25 both of the valves will sweep across the feed member closing the openings for a short period of time. The valve member will also serve as an agitator to cause the lubricant to be fed toward the recess and passages. The lugs on the disk that serve to open the outlet valve are preferably two in number corresponding to the two valves, and are located to open the outlet valve during the time that one of said valves covers the recess in the feed member. At the intervening period, the

outlet valve will be retained closed by its spring.

In the modification shown in Figs. 11-16 the feed member 40 (shown in Figs. 11, 13 and 15,) is provided with an inlet passage 41 an outlet passage 42, and passages 43 and 44 connecting the inlet and outlet with the outer face of the feed member; the ends of the latter passages in the face of the feed member being arranged in proximity. This feed member is also shown as provided with a passage 45 connecting the inlet 41 with the outlet 42. In the modifications shown in Figs. 12, 14 and 16, the connecting passage 45 is omitted. This feed member is shown applied to a receptacle 46 at its lower portion, the receptacle having an outlet 47 connecting with the outlet portion 42 of the feed member, and controlled by an outlet valve 48 that may be operated by means similar to said outlet valve 16, controlling the passage to the exit passage 49. In this modification the inlet passage 41 is extended in the form of a tube 42 opening into the upper portion of the receptacle. The cap 50 of the receptacle is shown as provided with an inlet 51 for atmospheric air.

The operation of the feed member in this device is somewhat in the nature of an injector action. With the form shown in Fig. 8, the air enters the inlet passage 8 and thence passes through the reduced passage 9 into the lower portion of the receptacle, and passes out through the reduced passage 14 into the outlet, when the outlet valve is opened. The passage of the air or gas will serve to draw or suck the graphite between the two passages 9 and 14, along with it into the outlet. The same operation takes place with respect to the feed member illustrated in Figs. 12, 14, 15 and 16; the air entering from inlet 41 through reduced passage 43 into the receptacle, and leaving through reduced passage 44 into the outlet 42, will suck or draw graphite along with it. In the forms shown in Figs. 1-7, the air will find a more direct outlet through passage 15, but by injector action will draw the air or graphite out of passage 14 while the pressure will cause the air to enter the reduced passage 9 and the latter will find its way to the outlet 14 carrying the graphite with it. The same operation takes place with the form shown in Figs. 11 and 13, the air having a more direct outlet by passage 45 will also operate by injector action.

In the form of feed member shown in Fig. 17, the recess 35 shown in Fig. 7 is omitted; and a recess 65 is provided in the valve 63, on the head 64. The passages 61 and 62 in the feed member 60 lead to the face of the feed member, and the recess 65 provides communication between the ends of these passages, yet cuts off communication between them and the lubricant in the recep-

tacle. A regular predetermined quantity of lubricant is fed, according to the capacity of the recess at each operation of the valves. In the other form of feed member shown the amount of lubricant fed is regulated by the length of time the outlet valve is held open.

Having now particularly described my invention, I claim:

1. In a lubricator for feeding graphite, a receptacle, a member at the lower part of the receptacle having an inlet passage, and also having an outlet passage, the member having a passage leading from the inlet to one face of the member, the member also having a passage leading from the face of the member to the said outlet, the ends of the said two passages in the face of the member being located in proximity.

2. In a lubricator for feeding graphite, a receptacle, a member at the lower part of the receptacle having an inlet passage and also having an outlet passage, the member having a passage leading from the inlet to one face of the member, and the member also having a passage leading from the face of the member to the said outlet, the ends of the said two passages in the face of the member being located in proximity, and a valve for controlling the outlet passage.

3. In a lubricator for feeding graphite, a receptacle, a member at the lower part of the receptacle having an inlet passage and also having an outlet passage, the member having a passage leading from the inlet to one face of the member, and the member also having a passage leading from the face of the member to the said outlet, the ends of the said two passages in the face of the member being located in proximity, a valve controlling the outlet passage, and a valve member arranged to close communication between said latter passage ends and the receptacle.

4. In a lubricator for feeding graphite, a receptacle, a member at the lower part of the receptacle having an inlet passage and also having an outlet passage, the member having a passage leading from the inlet to one face of the member, and the member also having a passage leading from the face of the member to the said outlet, the ends of the said two passages in the face of the member being located in proximity, a normally closed valve for the outlet, a valve member arranged to close communication between said passage ends and the receptacle, and operative means for the valves organized to open the outlet valve for a period while the said valve covers the said passage ends to the receptacle.

5. In a lubricator for feeding graphite, a receptacle, a member at the lower part of the receptacle having an inlet passage, and also having an outlet passage, the member having a passage leading from the inlet to one face of the member, the member also having a

passage leading from the face of the member to the said outlet, the ends of the said two passages in the face of the member being located in proximity, a rotatable member having a head, a double valve mounted on the head to have an endwise movement thereon with valve members at diametrically opposite portions that alternately close communication between the two passage ends and the receptacle on rotation of the shaft, the outlet valve member being operatively connected with the said shaft to be normally closed but opened while the said valves close the said passage ends in the said member.

6. In a lubricator for feeding graphite, a receptacle, a member at the lower part of the receptacle having an inlet passage and also having an outlet passage, the member having a passage leading from the inlet to one face of the member, and the member also having a passage leading from the face of the member to the said outlet, the ends of the said two passages in the face of the member being located in proximity, the member also having a passage connecting the inlet with the outlet passages.

7. In a lubricator for feeding graphite, a receptacle, a member at the lower part of the receptacle having an inlet passage and also having an outlet passage, the member having a passage leading from the inlet to one face of the member, and the member also having a passage leading from the face of the member to the said outlet, the ends of the said two passages in the face of the member being located in proximity, the member also having a passage connecting the inlet with the outlet passages, and a valve controlling the outlet passage.

8. In a lubricator for feeding graphite, a receptacle, a member at the lower part of the receptacle having an inlet passage and also having an outlet passage, the member having a relatively small passage leading from the inlet to one face of the member, the member also having relatively small a passage leading from the face of the member to the said outlet, the ends of the said two passages in the face of the member being located in proximity, and extending in opposite directions from such ends.

9. In a lubricator for feeding graphite, a receptacle, a member at the lower part of the receptacle having an inlet passage and also having an outlet passage, the member having a relatively small passage leading from the inlet to one face of the member, the member also having relatively small a passage leading from the face of the member to the said outlet, the ends of the said two passages in the face of the member being located in proximity, and extending in opposite directions from such ends, the member also having a passage connecting the inlet with the outlet passages.

10. In a lubricator for feeding graphite, a receptacle, a member at the lower part of the receptacle having an inlet passage and also having an outlet passage, the member having
5 a passage leading from the inlet to one face of the member, and the member also having a passage leading from the face of the member to the said outlet, the ends of the said two passages in the face of the member being
10 located in proximity, the member also having a passage connecting the inlet with the outlet passages, a rotatable member having a head, a double valve mounted on the head to have an endwise movement therein with
15 valve members at diametrically opposite portions that alternately close communication between the two passage ends and the receptacle on rotation of the shaft, the outlet valve member being operatively connected
20 with the said shaft to be normally closed but opened while the said valves close the said passage ends in the said member.

11. In a lubricator for feeding graphite, a receptacle, a member at the lower part of the
25 receptacle having an inlet passage and also having an outlet passage, the member having a passage leading from the inlet to one face of the member, and the member also having a passage leading from the face of the
30 member to the said outlet, the ends of the said two passages in the face of the member being located in proximity, the member having a recess including said ends.

12. In a lubricator for feeding graphite, a
35 receptacle, a member at the lower part of the receptacle having an inlet passage and also having an outlet passage, the member having a passage leading from the inlet to one face of the member, and the member also
40 having a passage leading from the face of the member to the said outlet, the ends of the said two passages in the face of the member being located in proximity, the member having a recess including said ends, a valve arranged to close the recess to the receptacle,
45 and a valve controlling the outlet.

13. In a lubricator for feeding graphite, a receptacle, a member at the lower part of the receptacle having an inlet passage and also
50 having an outlet passage, the member having a passage leading from the inlet to one face of the member, and the member also having a passage leading from the face of the

member to the said outlet, the ends of the said two passages in the face of the member
55 being located in proximity, the member having a recess including said ends, a valve arranged to close the recess to the receptacle, and a valve controlling the outlet, and means for operating the valves causing the outlet
60 valve to open while the recess is closed by its valve.

14. In a lubricator for feeding graphite, a receptacle, a member at the lower part of the receptacle having an inlet passage and also
65 having an outlet passage, the member having a passage leading from the inlet to one face of the member, and the member also having a passage leading from the face of the member to the said outlet, the ends of the
70 said two passages in the face of the member being located in proximity, the member having a recess including said ends, a valve member arranged to close the outlet of said chamber, a rotatable member having a head, a
75 double valve mounted on the head to have an endwise movement thereon with valve members at diametrically opposite portions that alternately cover the recess in the bottom member on rotation of the shaft, the valves
80 being wider than the recess to close the recess for a period of time during the rotation of the shaft, the outlet valve member being operatively connected with the said shaft, the outlet valve being normally closed but open
85 while the said valves close the recess in the bottom member.

15. In a lubricator for feeding graphite, a receptacle, a member at the lower part of the receptacle having an inlet passage and also
90 having an outlet passage, the member having a passage leading from the inlet to one face of the member, and the member also having a passage leading from the face of the member to the said outlet, the side of the
95 said two passages in the face of the member being located in proximity, a head shiftable in the receptacle, and a valve member on the head arranged to close communication between said passage ends and the receptacle,
100 the valve having a limited movement on the head away from the passage ends.

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Witnesses:

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