

No. 719,941.

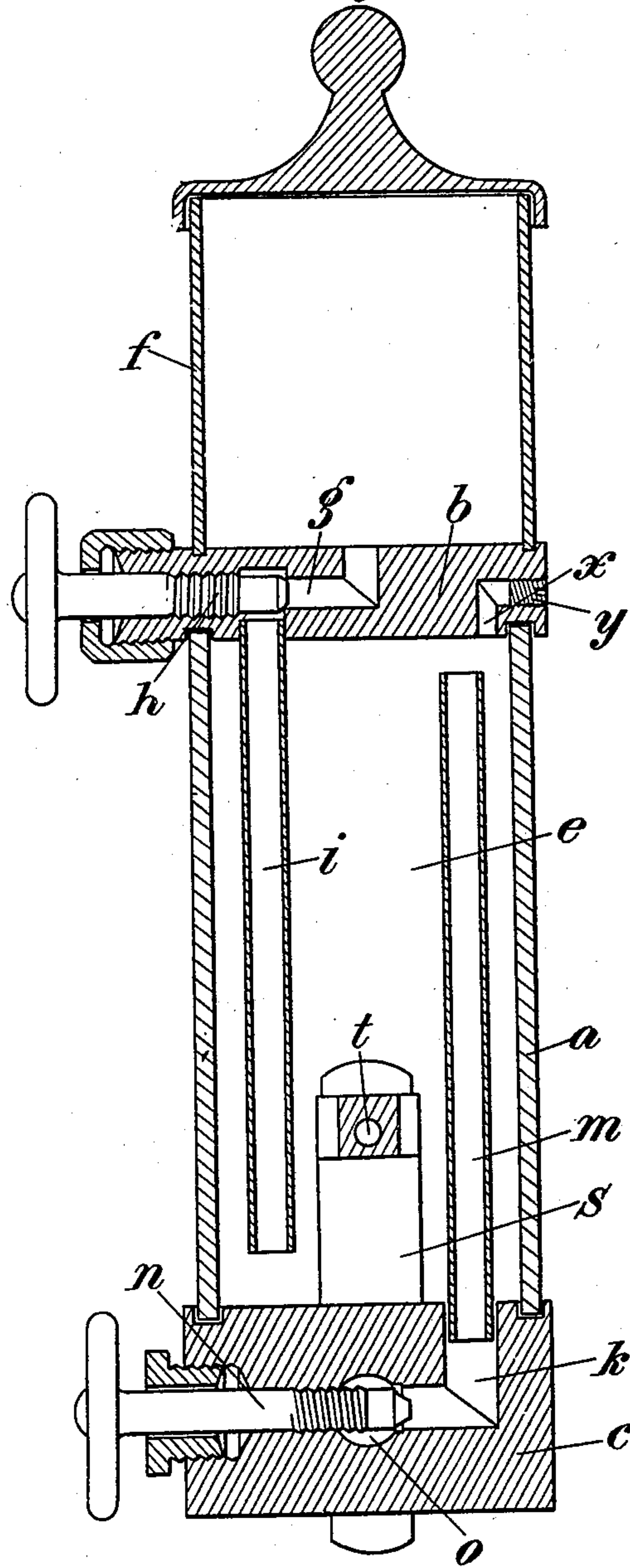
PATENTED FEB. 3, 1903.

M. B. HANSEN.
LUBRICATING APPARATUS.
APPLICATION FILED JULY 24, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

Henry J. Scherbar
Conrad Zimmer.

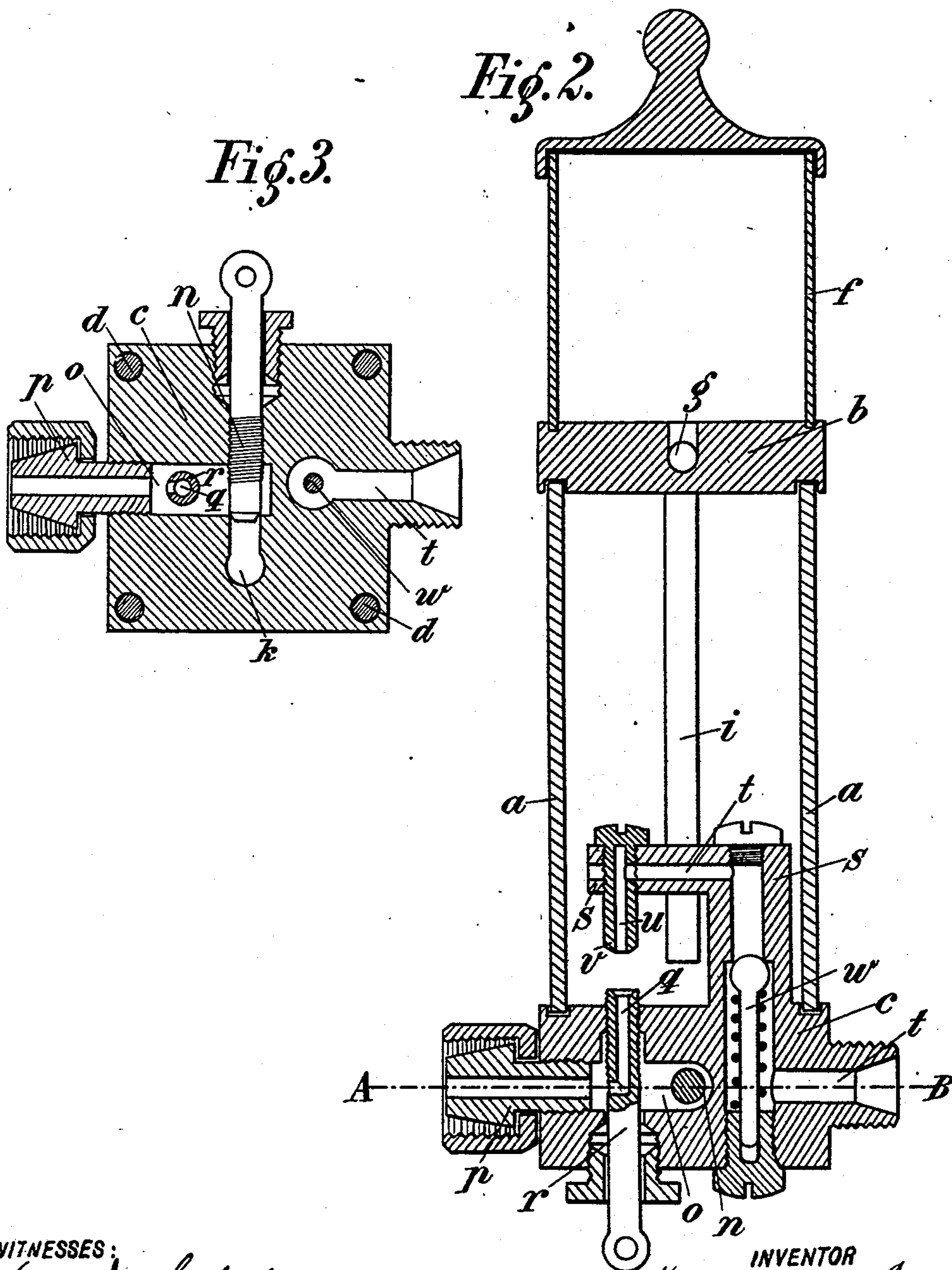
INVENTOR

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M. B. HANSEN.
LUBRICATING APPARATUS.
APPLICATION FILED JULY 24, 1902.

NO MODEL.

2 SHEETS—SHEET 2.



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LUBRICATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 719,941, dated February 3, 1903.

Application filed July 24, 1902. Serial No. 116,782. (No model.)

To all whom it may concern:

Be it known that I, MORTEN BALTAZAR HANSEN, manufacturer, of Gothersgade 65, Copenhagen, in the Kingdom of Denmark, have invented certain new and useful Improvements in Lubricating Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The present invention refers to an apparatus adapted for lubricating movable machine parts with a mixture of oil and graphite or similar lubricants. The apparatus is constructed in such a manner that a very exact and instantaneous regulation of the quantity of graphite in proportion to the oil can be effected.

The invention is illustrated in the accompanying drawings, in which—

Figures 1 and 2 represent two vertical longitudinal sections through the apparatus drawn at right angles to each other, and Fig. 3 is a section on the line A B of Fig. 2.

a is a tube, of glass, metal, or other suitable material, provided with top and bottom covers b and c , pressed tightly against the edge of the tube by means of screw-bolts d . (See Fig. 3.) In this way a perfectly-tight chamber e , called the "mixing-chamber," is formed inside the tube a . Above the top cover b is arranged a filling-cup f , communicating with the mixing-chamber e through a passage g , that may be closed and opened by means of a hand-valve h . The passage g opens into a tube i , reaching almost down to the bottom of the chamber e . In the bottom cover c is also arranged a passage k , opening into a tube m , extending upward into the mixing-chamber e and reaching almost to the top of this chamber. The passage k may by means of a hand-valve n be made to communicate with a channel o in the bottom cover c , into which channel is screwed a conical tube or union p , capable of being connected with an oil-pump of a suitable type. Through the channel o is passed a screw r , having an angular passage

q . The upper end of the screw r reaches up into the chamber e , so that the channel o , and consequently also the conduit from the oil-pump, is in connection with the chamber e through the passage q . The screw r is termed the "regulating-screw." Lastly, the bottom cover c is provided with a part s , projecting into the chamber e and having a passage t , whose one end opens out into the chamber e through a passage u in a screw v , placed so that the passages q and u are lying in line with each other. The other end of the passage t is carried out through the bottom cover c and connected with a conduit leading the oil and graphite mixture to that part of the machine which it is desired to lubricate. The passage t is provided with a check-valve w .

The apparatus is, as mentioned, inserted in the pipe-conduit leading from the oil-pump to the spot where the lubrication is required and is mounted as near to this place as circumstances will permit.

Before the apparatus is to act the chamber e is completely filled with oil from the oil-pump.

In order to fill the chamber e , the regulating-screw r is screwed up against the screw v , the ends of these screws being shaped so as to be able to form a tight joint. The hand-valves h and n are then opened and the piston of the oil-pump pressed down. The oil will then pour from the pipe m into the chamber e , the compressed air escaping through a small passage x in the top cover b . When the oil begins to flow out through the passage x , this latter is closed by means of a screw-plug y and the filling-cup f is filled with a mixture consisting of graphite ground in oil. The piston of the oil-pump is then raised, whereby the graphite and oil mixture from the filling-cup is sucked down through the passage g and the tube i into the chamber e , which it fills from below, while the oil from this chamber is sucked out through the tube m , the passages k and o , and back again to the oil-pump. When the mixture of graphite and oil has filled the chamber e to about one inch from the top cover b , the motion of the pump-piston has stopped and the hand-valves h and n closed. The apparatus is now ready to work. The oil-pump being then

started in the usual manner the oil will then be forced through the conical tube *p* and thence through the passages *o* and *q* to the passage *u* of the screw *v*, whence the oil will pass through the passage *t*, fitted with the check-valve *w*, to the place to be lubricated, the oil being constantly under pressure from the oil-pump.

As long as the regulating-screw *r* is screwed up against the screw *v* the oil from the oil-pump will pass unmixed through the apparatus and the part to be lubricated will receive pure oil only; but when the regulating-screw *r* is screwed down a little, so that there will be some distance between the ends of the two screws, the oil flowing from the passage *q* will rise through the space between the two screws filled with a mixture of oil and graphite and carry along some of the graphite.

Experience shows that the oil will flow through the passage *u* and farther on to the machine part to be lubricated mixed with graphite in a proportion dependent only on the distance between the two screw ends *r* and *v*, so that the greater this distance the larger will be the quantity of graphite contained in the oil passing through the passage *u*. The amount of graphite in the mixture in the chamber *e*, however, is without any influence upon the quantity of graphite in the lubricating-oil.

As pure oil is constantly introduced and a corresponding quantity of oil and graphite is drawn off, the amount of pure oil which fills the upper part of the chamber *e* will gradually increase, while the quantity of graphite in the chamber *e* decreases in the same proportion. The chamber *e* must therefore be refilled occasionally in the before-described manner.

Experiments have shown that by means of this apparatus the quantity of graphite in the lubricating-oil can be regulated at pleasure and within wide limits. It has thus been possible with the same filling of the chamber *e* to lubricate with oil in which the quantity of graphite was hardly visible, as well as with oil whose contents of graphite were so great that the oil was quite thick, and, lastly, with oil containing any quantity of graphite between these two extremes. The axis of the screws *r* and *s* need not absolutely be vertical, as shown on the drawings.

By means of the described apparatus and by adjusting the regulating-screw *r* it becomes possible to obtain any desirable proportion of graphite and oil mixture, and this proportion will instantaneously be altered when the position of the screw *r* is changed. As it is at the part to be lubricated that changes in the mixture shall take effect, the distance between the said part and the regulating-screw should be as small as possible, while the distance between the apparatus and the lubricator-pump is of no consequence.

Having now particularly described and ascertained the nature of this said invention and in what manner the same is to be performed, I declare that what I claim is—

1. A lubricating apparatus, consisting of a mixing-chamber, a bottom cover and a top cover for the same, a filling-cup above the top cover, a valved channel in said top cover for conducting the contents of the filling-cup into the mixing-chamber, a valved channel in the bottom cover connected with the mixing-chamber, and a second channel in the bottom cover at right angles to the valved channel connected therewith and with the oil-pump, substantially as set forth.

2. A lubricating apparatus, consisting of a mixing-chamber, a top cover and a bottom cover for the same, a screw-stem tubular at its upper end extending through the bottom cover, a channel in said bottom cover communicating with that in the screw-stem and with an oil-pump, a tubular member in said mixing-chamber connecting at one end with an outlet-channel, a tube in line with the regulating-screw leading from the chamber into the opposite end of said tubular member, and a check-valve in the outgoing end of said tubular member, substantially as set forth.

3. A lubricating apparatus, consisting of a mixing-chamber, a top cover and a bottom cover for the same, the latter being provided with two channels, one communicating with an oil-pump and the other with the part to be lubricated, a regulating-screw arranged transversely to the first channel and provided with an angular passage communicating with said first channel and with the mixing-chamber, a tubular member at the interior of the mixing-chamber connected at one end with the outgoing channel and provided at its opposite end with a tubular passage in line with the regulating-screw, and a check-valve in said outgoing channel, substantially as set forth.

4. A lubricating apparatus, consisting of a mixing-chamber, a top cover, a filling-cup above the same, a valved channel in said top cover, a pipe extending from said channel into the lower part of the mixing-chamber, a bottom cover, a valved channel in said bottom cover, a tube extending from the inner end of said bottom channel into the upper part of the mixing-chamber, a tube connecting the bottom channel with an oil-pump, a vent-channel for the mixing-chamber in the top cover, and a screw-plug for said vent-channel, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

MORTEN BALTAZAR HANSEN.

Witnesses:

E. BOUTARD,

J. C. JACOBSEN.