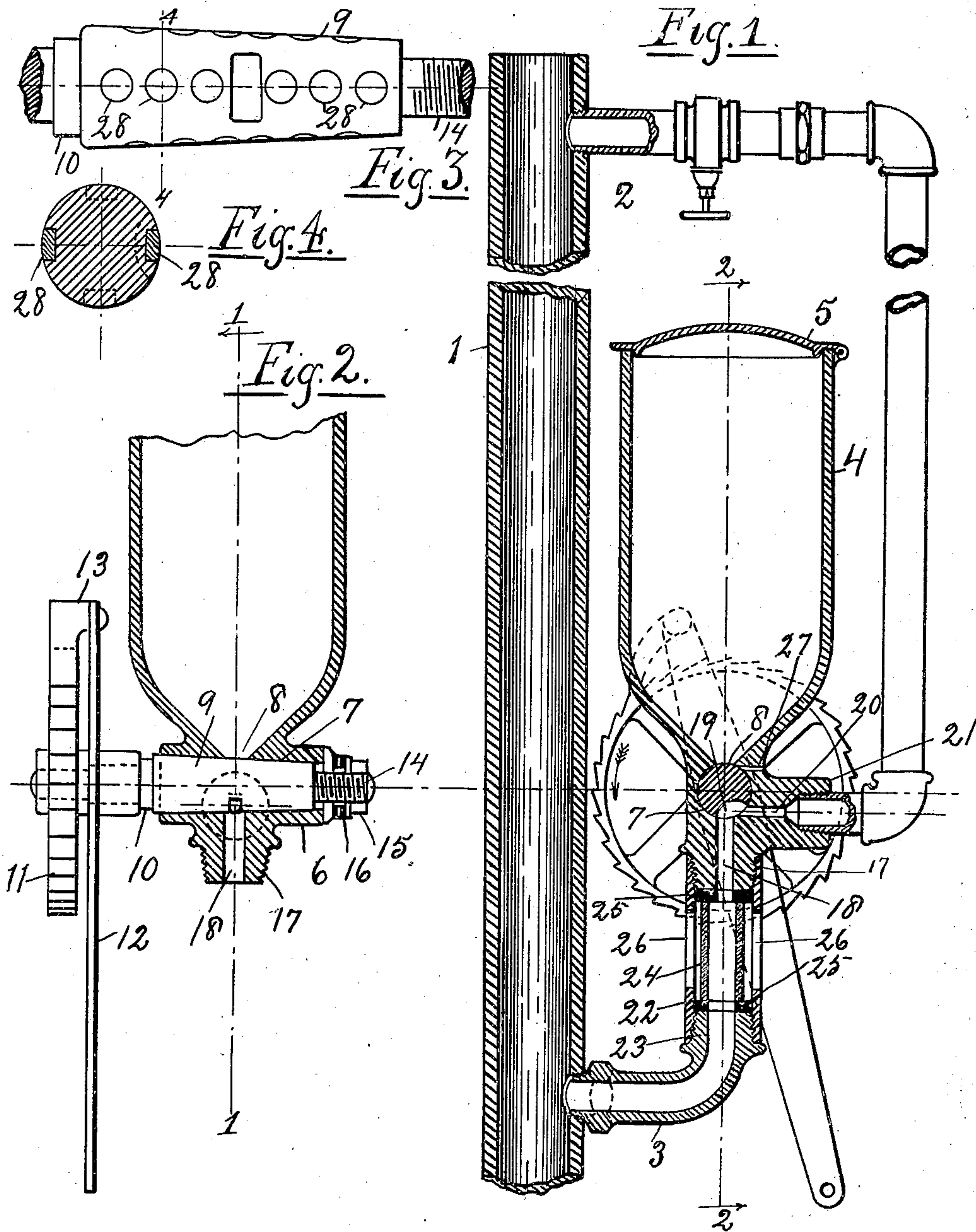


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W. B. WRIGHT.
GRAPHITE LUBRICATOR.
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GRAPHITE-LUBRICATOR.

No. 828,363.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WALTER B. WRIGHT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Graphite-Lubricators, of which the following is a specification.

This invention relates to improvements in graphite-lubricators or lubricators of that type adapted to feed to a part to be lubricated pulverulent graphite or analogous dry powdered material. In the practical operation of lubricators of this general type it has been found extremely difficult, if not impossible heretofore, to so construct the lubricator that when used for introducing the lubricant to a steam-cylinder or other chamber under steam-pressure the steam and water of condensation are prevented from entering the graphite-receptacle, converting the latter into a pasty mass, and thus preventing or interfering with the feed of the lubricant. Moreover, it has been found in practice that it is necessary to so construct the lubricator that the graphite is conveyed by some vehicle entirely into the cylinder, since its pulverulent nature prevents a reliable flow of the lubricant itself.

It is the object of the present invention therefore to provide a construction in which the graphite-receptacle is sealed at all times against the admission of steam or vapor; to provide a construction in which the graphite is removed from the receptacle in a positive and reliable manner and without unsealing the outlet; to provide a construction in which the flow of steam and water of condensation is utilized to convey the graphite from the outlet of the lubricator into the chamber of consumption; to provide a construction in which the graphite is removed in successive small charges at intervals; to provide a construction in which the graphite is fed through or past a transparent wall in its passage to the point of consumption, thus providing a "sight-feed;" to provide a tapered rotary plug member seated in a correspondingly-tapered bore and provided in its exterior with longitudinally-distributed cavities, within which are arranged bodies of hard lubricant, and in general to provide a simple and improved construction of the character referred to.

To the above ends the invention consists in the matters hereinafter described, and more

particularly pointed out in the appended claims.

The invention will be readily understood from the following description, reference being had to the accompanying drawings, in which—

Figure 1 is a view chiefly in vertical axial section, but partly in elevation, of fragmentary portions of a steam-cylinder with my improved graphite-lubricator applied thereto. Fig. 2 is a fragmentary section taken partly in the line 2 2 of Fig. 1 and partly in side elevation. Fig. 3 is a detail in elevation of the tapered plug member; and Fig. 4 a transverse sectional view of the same, taken on line 4 4 of said Fig. 3.

Referring to the drawings, 1 designates as a whole a steam trunk or pipe, with which communicate at two points eduction and induction pipes 2 and 3, respectively.

4 designates as a whole a suitable reservoir or receptacle adapted to contain pulverized graphite and provided with a removable cover 5. The lower end of the reservoir is preferably funnel-shaped or downwardly-converging and terminates in a valve-body extension 6. Through said valve-body is formed a transverse tapered bore 7, which at its upper side opens into the apex of the funnel-shaped bottom of the reservoir to form a feed-inlet 8. Within said bore is seated a correspondingly-tapered plug member 9, provided at one end with an extension 10, carrying a ratchet-wheel 11, rigidly secured to rotate with the plug member. Upon the extension 10 is also journaled a pawl-lever 12, carrying at its upper end a gravity-pawl 13, which engages and coöperates with the ratchet-wheel 11. The opposite end of the plug member protrudes beyond the valve-casing and is provided with a threaded extension 14, carrying a clamping-nut 15. Between the nut and end face of the valve-casing is interposed a suitable resilient packing 16, which serves to hold the plug member drawn into steam-tight feeding engagement with the bore.

At its lower side the valve-casing is provided with a threaded extension or nipple 17, which is axially bored to provide a passage 18, which communicates with the transverse bore of the body.

At a point in register with the bore 18 and the feed-inlet 8 the plug member is provided in its exterior with a concave or segmental

shaped recess 19, which during the rotation of the plug member will be alternately brought into register with the feed-passage 8 of the reservoir and the delivery-passage 18 of the valve-body.

20 designates a steam-passage leading laterally from the bore 7 outwardly through the valve-body and through a nipple extension 21, formed integrally with said body. The passage 20 communicates with the bore 7 at a point near the point of communication therewith of the delivery-passage 18, so that when the plug member is rotated into the position shown in Fig. 1 its recess 19 forms a communicating port between the passages 20 and 18. The eduction-pipe 2, leading from the upper portion of the steam-trunk, is connected to and communicates with the nipple 21. The induction-pipe 3 is similarly connected with the nipple 17, a glass sight-feed being interposed in the induction-pipe between the lubricator and the cylinder. As a convenient construction this sight-feed is formed by connecting a cylindric shell or casing 22 with the nipple 17 and correspondingly-threaded end 23 of the induction-pipe, said member 22 being reversely threaded at its ends and operating as a clamping member to hold a glass tube-section 24, interposed between the proximate ends of the nipple 17 and induction-pipe, respectively. Suitable packings 25 are interposed between the ends of the glass tube-section and pipe and nipple, respectively, and the cylindric casing is provided with sight-openings 26.

Inasmuch as the recess 19 of the plug member will trap a small quantity of steam each time it is rotated out of register with the passage 20, I provide a vent-passage 27, which communicates with the bore within which the plug member is seated and extends out through the side wall of the valve-body at a point near the upper side of the plug member. As a further feature of improvement I provide the exterior of the plug member with a series of cavities or recesses 28, which preferably have cylindric sides and are rather shallow as to depth. In these recesses, which are distributed over the surface of the plug member, I place a suitable solid lubricant, the object being to provide a continuous supply of lubricant to the surface of the plug member, which will maintain a steam and liquid tight joint between the latter and its seat and will at the same time reduce the friction to a minimum. By the employment of this hard lubricant, supplied from cavities communicating with the bearing-surface, I find that the lubricating device will operate for long periods of time without any attention beyond filling the reservoir with graphite from time to time.

The operation of the device is as usual and need not be detailed. It is to be noted, however, that the connection of the eduction-

pipe 2 with the passages of the valve-body and the arrangement of the latter are such that the direct pressure of the steam is utilized to positively dislodge the graphite carried into such passages by the pocket or recess in the plug member, and, moreover, the water of condensation which accumulates in the lower part of the eduction-pipe during the intervals between the successive openings of the passage by the plug member serves as a vehicle to wash out and distribute the graphite so that it passes into the steam-trunk more or less gradually with the water of condensation. The water of condensation upon arriving within the main body of the trunk is immediately evaporated, thus freeing the graphite carried thereby and causing it to disperse and become more or less evenly distributed in the current of steam contained in the trunk.

The most common use of a lubricator of this character is that in which it is employed to lubricate the interior of a steam-cylinder, in which case of course the steam-trunk referred to would be that constituting the steam-supply for the cylinder or cylinders. The uniform distribution of the graphite upon the interior of the cylinder is in this manner very perfectly effected.

It is particularly to be noted that the construction and arrangement is such that a steam-tight feed between the plug member and its seat is maintained in spite of wear, and accordingly the steam can at no time pass into the reservoir, and thus interfere with its dry pulverulent condition or affect the uniformity of feeding. Moreover, in the construction described I obviate all reciprocatory movement between the joints, and thus overcome the great difficulties heretofore experienced in the attempt to provide pocket-joints in reciprocatory parts.

I claim as my invention—

1. A lubricating apparatus, comprising a pipe forming a passage for motive fluid between points of different pressure, a lubricator-body inserted in said pipe having a passage forming an elbow bend in the pipe-passage, a tapering turn-cock rotatably seated in a transversely-disposed bore in said lubricator-body arranged to intersect the elbow bend, a cavity in one side of said cock arranged in circumferential register with the elbow-passage and adapted to form when in register therewith a communication between the normally disconnected parts of said passage, a hopper having its discharge-opening leading into the transverse bore of the lubricator-body and normally closed by the turn-cock, the angle subtended by the circumferentially-remote ends of said cavity in the turn-cock being less than the angular distance between either part of the elbow-passage which communicates with the transverse bore, whereby communication between

the elbow-passage and the discharge-opening of the hopper is at all times prevented, and means for rotating said turn-cock.

2. A lubricator apparatus, comprising a pipe forming a passage for motive fluid between points of different pressure, a lubricator-body inserted in said pipe having a passage forming an elbow bend in the pipe-passage, a tapering turn-cock rotatably seated in a transversely-disposed bore in said lubricator-body arranged to intersect the elbow bend, a cavity in one side of said cock arranged in circumferential register with the elbow-passage and adapted to form when in register therewith a communication between the normally disconnected parts of said passage, a hopper having its discharge-opening leading into the transverse bore of the lubricator-body and normally closed by the turn-cock, the angle subtended by the circumferentially-remote ends of said cavity in the turn-cock being less than the angular distance between either part of the elbow-passage which communicates with the transverse bore, whereby communication between the elbow-passage and the discharge-opening of the hopper is at all times prevented, a vent-opening extending through the lubricator-body at a point between the elbow-passage and discharge-opening of the hopper and communicating with the transverse bore, and means for rotating said turn-cock.

3. A lubricator apparatus, comprising a pipe forming a passage for steam between a source of steam-supply and point of lower pressure, a lubricator-body interposed in said pipe having an elbow-passage consisting of

substantially horizontal and vertical portions communicating with the supply and delivery sides of the interrupted pipe portions, respectively, a tapered turn-cock seated in a transverse bore in said lubricator-body, said bore being arranged to intersect and intercept said elbow-passage and having its axis located outside of the exterior angle of said passage, a cavity or pocket in the side of the turn-cock adapted to form a communication between the intercepted parts of the elbow-passage, a hopper at the upper side of said lubricator-body having a discharge-opening directly communicating with the upper side of said transverse bore and normally closed by said turn-cock, a vent extending through the lubricator-body and communicating with the transverse bore at a point between the horizontal part of the elbow-passage and the hopper discharge-opening and means for rotating said turn-cock, said cavity in the turn-cock being of a circumferential length or width less than the angular distance between the horizontal part of the elbow-passage and the discharge-opening of the hopper, so that the hopper is at all times sealed against communication with the steam-passage.

4. In combination with a valve-casing, a tapered plug-cock provided in its bearing-surface with cavities and solid lubricant arranged in said cavities, substantially as described.

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Witnesses:

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