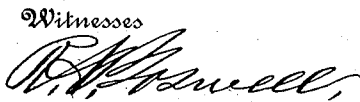


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5 SHEETS—SHEET 1.



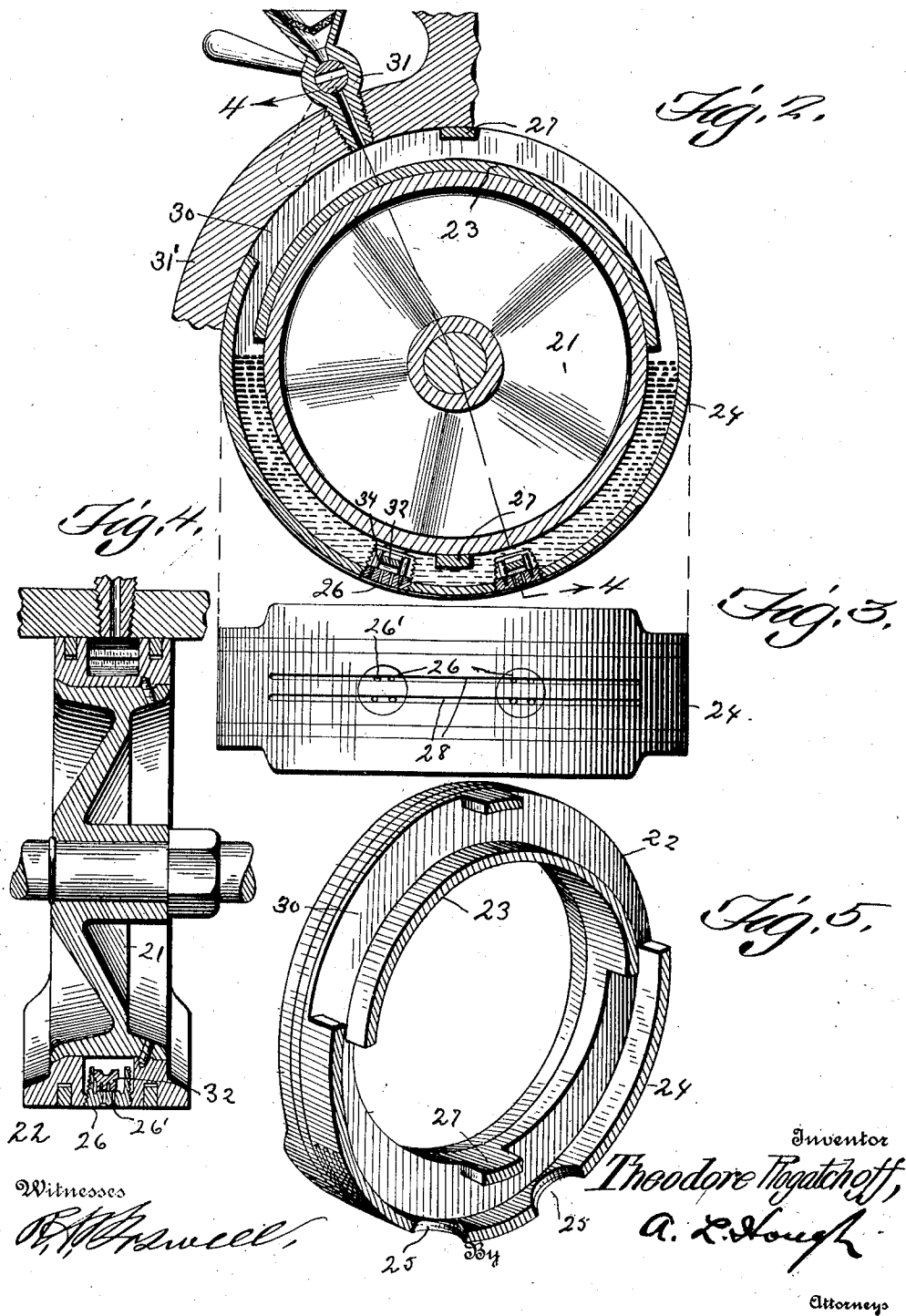
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SELF LUBRICATING PISTON.
APPLICATION FILED DEC. 9, 1918.

Patented Feb. 10, 1920.
5 SHEETS—SHEET 2.

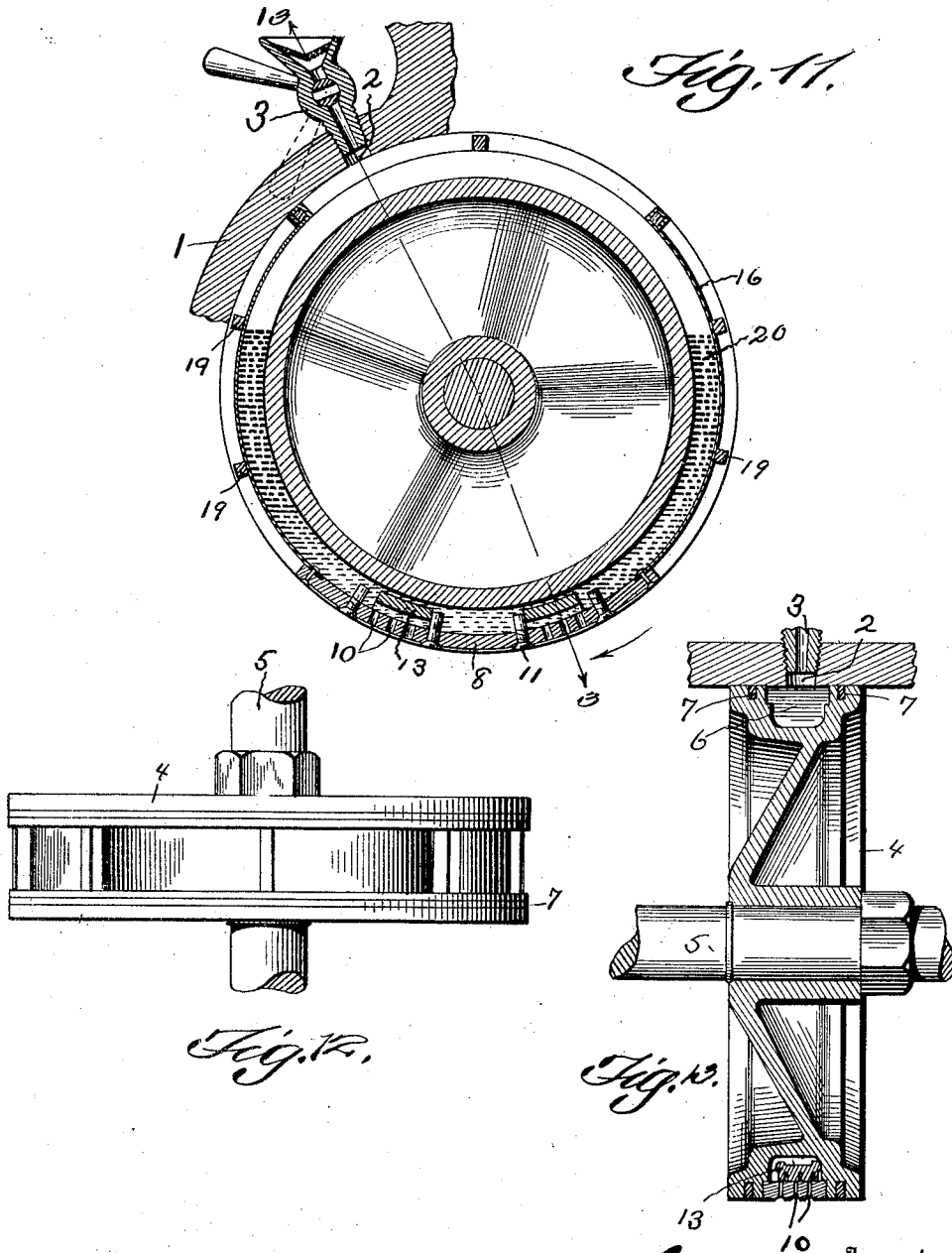


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5 SHEETS—SHEET 3.



Witnesses

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5 SHEETS—SHEET 4.

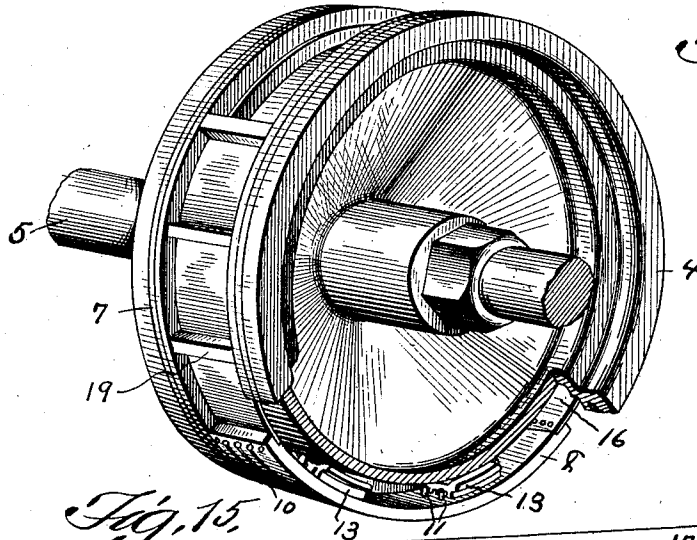


Fig. 14.

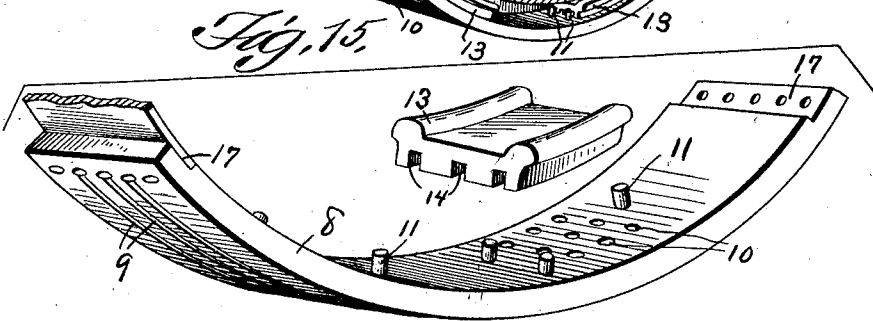


Fig. 15.

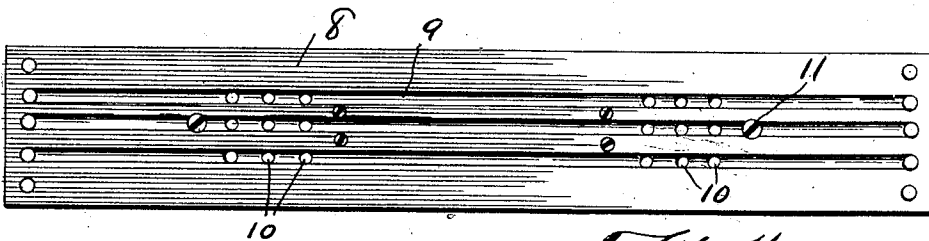


Fig. 16.

Witnesses

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Patented Feb. 10, 1920.

5 SHEETS—SHEET 5.

Fig. 17.

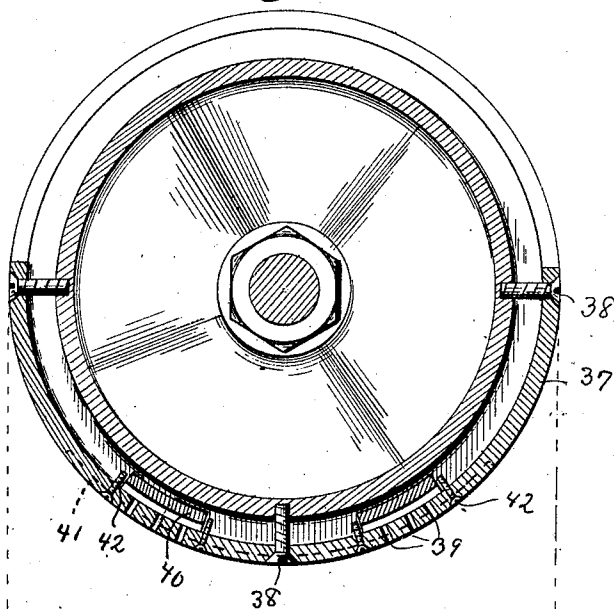
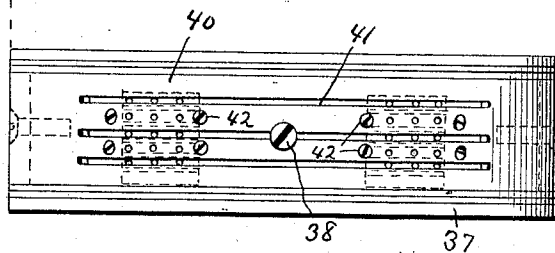


Fig. 18.



Witnesses.

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UNITED STATES PATENT OFFICE.

THEODORE ROGATCHOFF, OF BALTIMORE, MARYLAND.

SELF-LUBRICATING PISTON.

1,330,748.

Specification of Letters Patent.

Patented Feb. 10, 1920.

Application filed December 9, 1918. Serial No. 265,953.

To all whom it may concern:

Be it known that I, THEODORE ROGATCHOFF, a citizen of the Republic of Russia, residing at Baltimore city, in the State of Maryland, have invented certain new and useful Improvements in Self-Lubricating Pistons, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to new and useful improvements in pistons for locomotives and other engines, and the object in view is to produce a suitable lubricating means for the pistons.

The invention comprises a simple and efficient device of this character having various details of construction, combination and arrangement of parts which will be hereinafter fully described, shown in the accompanying drawings and then specifically defined in the appended claims.

My invention is illustrated in the accompanying drawings which, with the numerals of reference marked thereon, form a part of this application and in which:

Figure 1 is a perspective view of a piston made in accordance with my invention.

Fig. 2 is a vertical sectional view through the piston.

Fig. 3 is a bottom plan view.

Fig. 4 is a sectional view on line 4—4 of Fig. 2.

Fig. 5 is a detail perspective view of a bull ring.

Fig. 6 is a detail perspective of a plug with lubricating valve block.

Fig. 7 is a sectional view showing a modified form of the piston.

Fig. 8 is a sectional view on line 8—8 of Fig. 7.

Fig. 9 is a detail view of a slightly modified form.

Fig. 10 is an edge view of Fig. 9.

Fig. 11 is a central sectional view of a still differently modified form of the invention.

Fig. 12 is an edge view of Fig. 11.

Fig. 13 is a sectional view on line 13—13 of Fig. 11.

Fig. 14 is a perspective view of the form shown in Fig. 11, parts being broken away.

Fig. 15 is a detail perspective view of a part of the piston.

Fig. 16 is a bottom plan view of the plate shown in Fig. 15.

Fig. 17 is a sectional view of a modified form of the piston.

Fig. 18 is a bottom plan view of Fig. 17, and

Fig. 19 is a sectional view of a feature of the invention.

Reference now being had to the details of the drawings by numerals:

21 designates a piston which is apertured for the reception of the stem 21', and 22 is a bull ring having a circumferential groove 30 therein and which ring is mounted about the piston and securely fastened thereon.

Referring to Fig. 2 of the drawings showing a central sectional view through the piston and bull ring, it will be noted that the bull ring, a detail of which is shown in Fig. 5, is provided with two concentric flanges 23 and 24, the ends of which overlap each other, and 27 designates bridge portions between the walls of the grooved portion of the bull ring. Said flange 24 is provided with parallel grooves 28, shown clearly in Fig. 3 of the drawings, and threaded openings 25 are formed in the flange 24 and each is adapted to receive a circumferentially threaded plug 26, detail of which is shown in Fig. 6 of the drawings, and which plug has apertures 26' leading therethrough, and pins 34 having threaded portions tapped into the plugs project from the inner face of a recess in the plug. An oil valve block 32 is mounted in the recess of each plug intermediate the pins, said valve being provided with grooves 33 in its outer face, and through which a lubricant is adapted to flow.

Upon reference to Fig. 2 of the drawings, it will be noted that a valve casing 31 is threaded into the wall 31' of the cylinder and through which a lubricant is fed into the groove of the bull ring, the lubricant being shown by dotted lines.

In Fig. 7 of the drawings I have shown a modified form of the invention in which the bull ring 48, which is shrunk upon the circumference of a piston and held by plugs 48', clearly shown in Fig. 8 of the drawings, and 49 is a lubricating plate held to the bull ring by means of screws 50, said plate being provided with apertures for the reception of the plugs 26 having oil ducts 26' therein, and an oil valve block 32 is mounted in the recessed portion of the plug.

In Fig. 9 of the drawings is shown a

slightly modified form of the piston, in which the central portion 43 thereof, which is solid, is provided with a flange 45 circumferentially grooved as at 46, and provided with an integral flange 44 having a single plug 26 mounted therein.

In Figs. 11 to 16 of the drawings (inclusive) I have shown a still differently modified form of the piston, in which the piston 4 is provided with a circumferential groove 6 forming an oil chamber, said piston being mounted within a cylinder 1 having an opening 2 therein in which the valve 3 is threaded and through which lubricant is introduced into the groove 6.

In the form shown in Fig. 11, a lubricating plate 8 is held by means of rivets to the plate 16 and has ducts 10 formed therein through which lubricant passes into the elongated grooves 9, shown clearly in Figs. 15 and 16 of the drawings. In this modified form of the invention valve blocks 13, one of which is shown clearly in perspective in Fig. 15, are provided with channels 14 upon their outer faces, and which blocks are adapted to be positioned upon the inner concaved face of the lubricating plate 8. Screws 11 pass through the lubricating plate and serve to guide the valve blocks as they are caused to be given a back and forth movement incident to the reciprocating movement of the piston. The opposite ends of the plate 8 are shouldered as at 17, and 16 designate curved plates which are fastened at their lower ends to said shoulders. The upper portions of the plates 16 are fastened to the cross pieces 19 spanning the groove in the circumference of the piston.

In Figs. 17 and 18 is a still differently modified form of the invention and in which is shown a lubricating plate 37, apertured as at 39, which is fastened to the piston by means of screws 38 in the circumference of the piston. In this form of piston, which has channels 41 in the plate 37, screws 42 are mounted the ends of which project inside the groove and serve to guide the oil valve blocks 40.

In the form shown in Fig. 19 of the drawings, I have shown a means for preventing the passage of the oil through the ducts in the plug when the piston is not moving, and in which figure the reciprocating movement of the piston is necessary in order to throw the block 32 in opposite directions against the tensions of the springs 32^a. In this construction the block is provided with recesses 32^b connected by an aperture through which the pin 32^a passes, the ends of which pin are loosely held in the slots 26^a, permitting a vertical adjustment of the block 32 incident to wear. The form of block mounting shown in Fig. 19 also serves as a shock absorber to the oil valve or block and will prevent its coming forcibly against the op-

posite walls of the plug when the piston reciprocates.

In operation, oil is admitted through the valve 3 into the groove of the piston or bull ring, as the case may be, and as the piston is reciprocated the oil valve or block will be thrown back and forth against the ends of the recess in the plug, or when the device is constructed in accordance with the showing in Figs. 14 and 17 of the drawings, against the walls of the groove when the plug is dispensed with and an oil block is provided which rests upon the inner concaved surface of the lubricating plate or flange. Said oil valve tends to limit the amount of the lubricant permitted to pass through the ducts into the interior of the piston chamber.

By the provision of a lubricating device embodying the features of my invention, it will be noted that the annular space commonly formed in the circumference of a piston is utilized as a reservoir for oil, or where the pistons are dressed down and bull rings shrunk thereon are provided with grooves which are utilized for the same purpose.

When it is desired to dispense with the plug or the oil valve, the oil reservoir still may be utilized for lubricating the pistons by splashing means through the opening of groove at the top of piston. In the event of it being desired to dispense with the oil reservoir, the bottom plate which covers the groove in the piston may be utilized as a bearing for the bottom of the piston.

What I claim to be new is:

1. A self-lubricating piston of the horizontal type having a circumferential groove, and means for closing the lower portion of the groove, thereby forming a lubricant reservoir, said means having ducts for the passage of a lubricant to the exterior thereof to lubricate the piston.

2. A self-lubricating piston of the horizontal type having a circumferential groove, and means for closing the lower portion of the groove and thereby forming a lubricant reservoir, movable means within the groove adapted to regulate the passage of lubricant to the exterior of the piston.

3. A self-lubricating piston of the horizontal type having a circumferential groove, and means for closing the lower portion of the groove and thereby forming a lubricant reservoir, a movable member for regulating the flow of the lubricant to the exterior of the piston, and means for limiting the movement of said member.

4. A self-lubricating piston of the horizontal type having a circumferential groove, and means for closing the lower portion of the groove thereby forming a lubricant reservoir, a movable member for regulating the flow of the lubricant to the exterior of the piston, pins projecting from the lower

closed portion of the groove and in the path of said member to limit its movement in opposite directions.

5 5. A self-lubricating piston of the horizontal type having a circumferential groove with an apertured plate for closing the lower portion of the groove and forming a lubricant reservoir, said plate having an opening
10 formed therein, a removable apertured plug fitted in said opening, and means within the plug for regulating the flow of lubricant through the apertures of the plug to lubricate the exterior of the piston.

15 6. A self-lubricating piston of the horizontal type having a circumferential groove

with an apertured plate for closing the lower portion of the groove and forming a lubricant reservoir, said plate having an opening formed therein, a removable apertured plug fitted in said opening, said plug having projections thereon, a movable member mounted upon the plug between said projections and regulating the flow of lubricant through the aperture of the plug. 20

In testimony whereof I hereunto affix my signature in presence of a witness. 25

THEODORE ROGATCHOFF.

Witness:

A. L. HOUGH.