

(No Model.)

2 Sheets—Sheet 1.

M. WUERPEL.
RAILWAY SIGNAL.

No. 432,469.

Patented July 15, 1890.

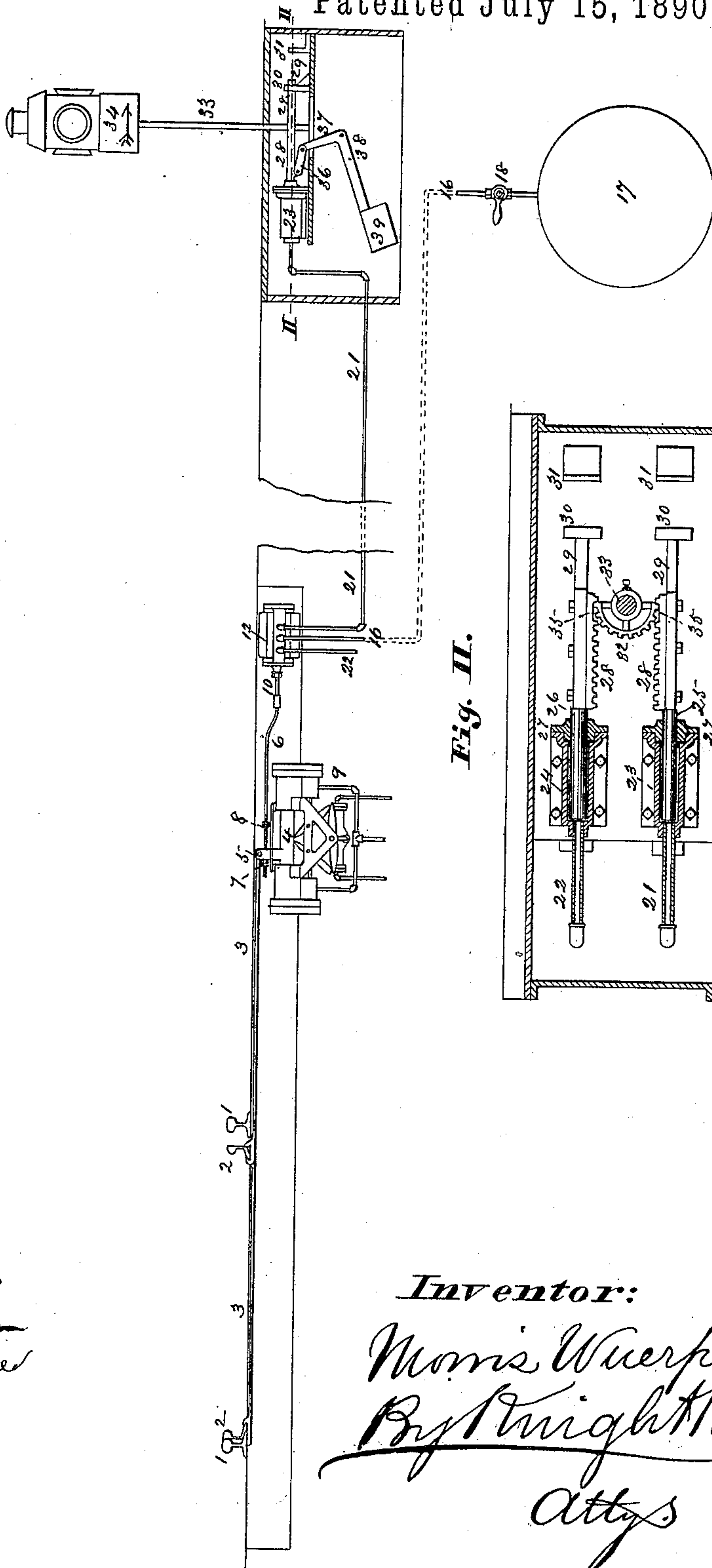


Fig. 1.

Fig. II.

Attest:
E. Arthur
Frank L. Rice

Inventor:
Morris Wuerpel.
By Knight Bros.
Attys.

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Fig. III.

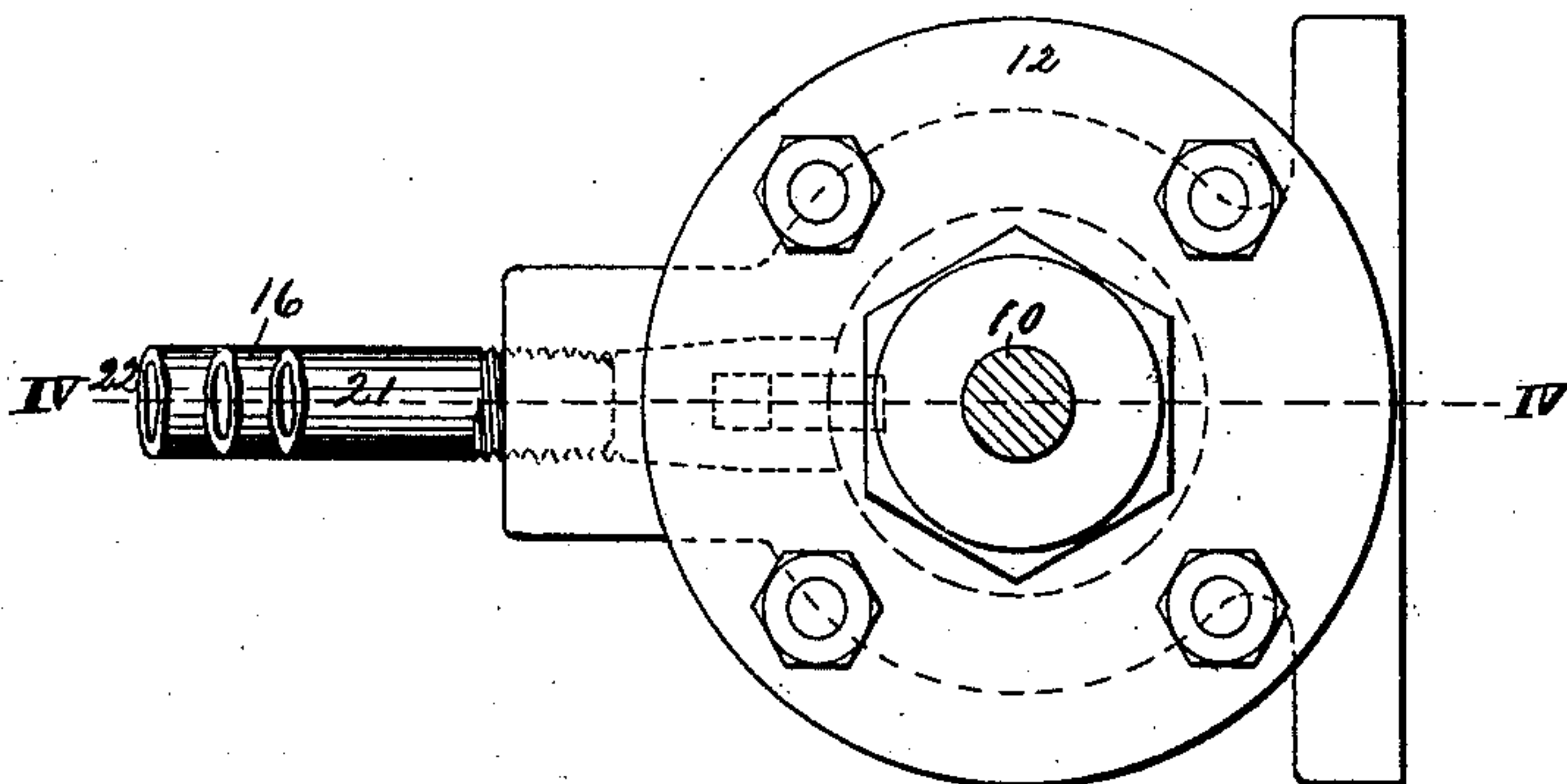
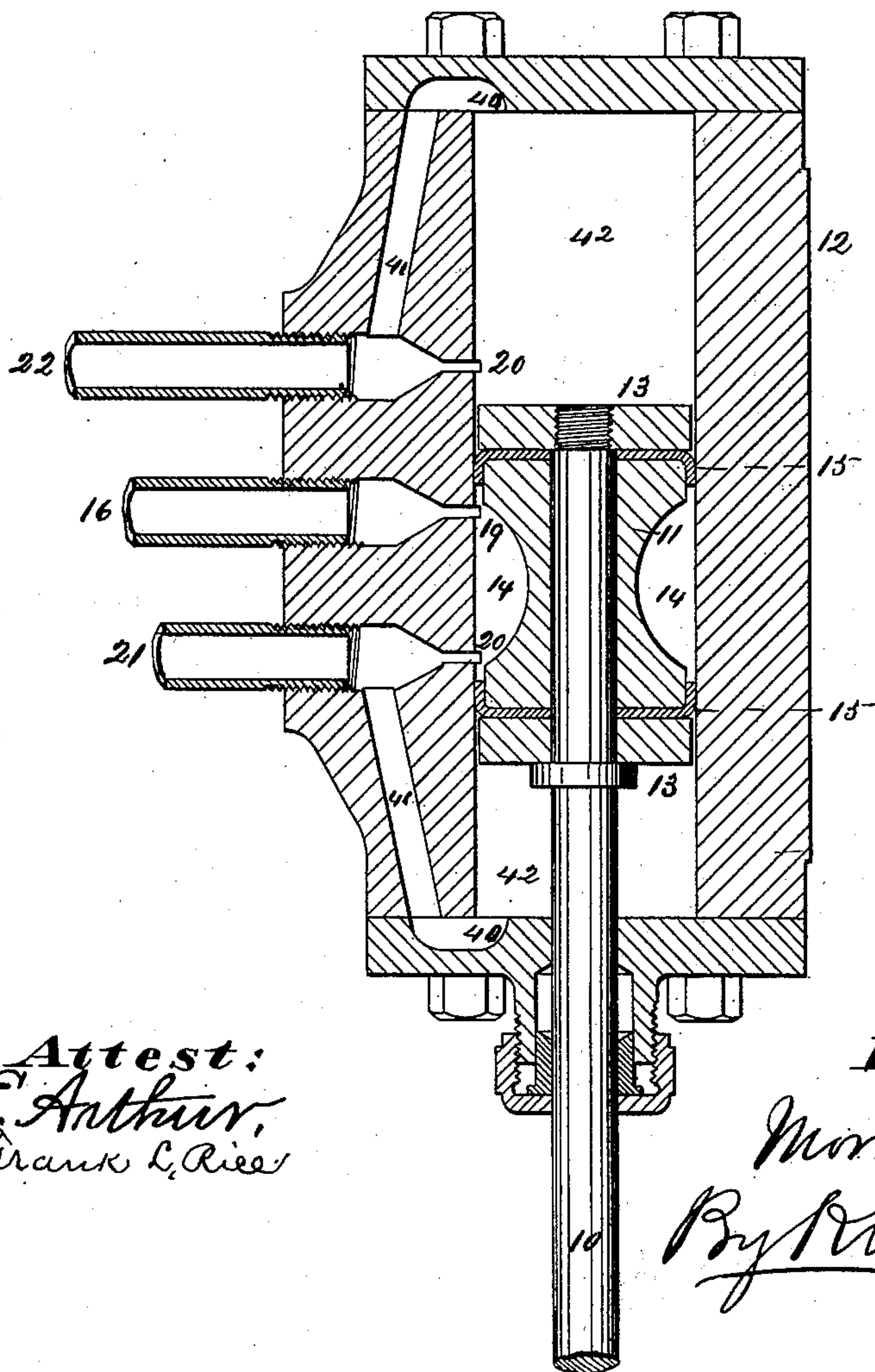


Fig. IV.



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Frank L. Rice

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UNITED STATES PATENT OFFICE.

MORRIS WUERPEL, OF ST. LOUIS, MISSOURI.

RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 432,469, dated July 15, 1890.

Application filed April 30, 1888. Serial No. 272,354. (No model.)

To all whom it may concern:

Be it known that I, MORRIS WUERPEL, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Railway-Signals, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

10 This is a device by which a rotary signal may be turned at any time to indicate the position of a switch, the signal being arranged to automatically return to a normal position.

Figure I is an elevation of the apparatus. 15 Fig. II is an enlarged horizontal section at II II, Fig. I. Fig. III is an end view of the valve case or cylinder, the valve-rod being shown in section. Fig. IV is a longitudinal section at IV IV, Fig. III.

20 At 1 are shown the fixed rails, and at 2 the movable rails, of a switch.

3 is the operating-rod connected to the moving switch-rails. The switch may be moved by hand or by machinery, as shown, or by 25 any suitable means, the means of moving the switch being outside my present invention. The rod 3 is attached to a slide-block 4, which has a projection 5 bored through for the passage of a rod 6, which is parallel with the rod

30 3. The projection 5 works on the rod 6 and imparts to the rod endwise movement by means of jam-nuts 7 and 8, that screw upon the rod and against which the projection impinges as it is moved backward and forward 35 by the rod 3. The movement of the rod 6 is shown to be much less than that of the rod 3, the projection 5 having "lost motion" on the latter between the nuts 7 and 8.

40 At 9 is shown a device for working the block 4; but as this forms the subject-matter of my patent No. 398,364, dated February 19, 1889, no description of the same will be here given. The rod 6 is part of or attached to the stem or rod 10 of a valve 11, that works as a 45 piston in the cylinder 12. The waist of the valve is of smaller diameter than the heads or ends 13, so that there is an annular space 14 at that point. The ends have "cup" or other packing 15, preventing the escape of 50 the contents of the annular chamber 14 between the ends of the valve and the cylinder.

16 is an induction-pipe, which may be

thrown into communication with a reservoir 17, containing water, air, or other fluid. Where the contents of the reservoir is liquid, 55 it may be placed at such an elevation as to produce the required pressure in the pipe 16 and annular chamber 14, or the reservoir may be closed and the pressure be produced by forcing air or other gaseous matter thereinto, 60 or by forcing liquid into it when it contains, practically, compressible fluid, as air or other gases. The communication between the pipe 16 and reservoir may be opened and closed 65 by a three-way cock 18 or any other suitable means, which may be at a considerable distance from the cylinder 12. The pipe 16 communicates with the chamber 14 by a port 19. At 20 are ports leading from the interior of the cylinder to eduction-pipes 21 and 22. These 70 pipes extend, respectively, to the inner ends of cylinders 23 and 24, in which work plungers 25 and 26. These plungers work in cup or other packing in the heads 27 of the cylinders. To each plunger is attached a cog-rack 28, hav- 75 ing an extension 29, working endwise in a guide 30.

31 are abutments, against which the ends of the extensions 29 impinge as the racks reach their extreme outward position. 80

32 is a cog segment or wheel, which is keyed to the shaft 33 of the rotatory signal 34. Each of the racks has its teeth cut away at 35, so that the segment or wheel 32 may be turned 85 by either of the racks, while the other rack remains at rest.

No novelty is herein claimed for the pipes 21 22, cylinders 23 24, plungers 25 26, racks 28, or the signal with the cog-segment 32 on its shaft, these features being shown in my Let- 90 ters Patent numbered 330,859, issued to me November 17, 1885. This patent has also the same means for the restoration of the signal to a normal position after the pressure has been removed in whole or in part from the 95 fluid within the active plunger. This means of returning the signal to its normal position is as follows: To each of the rack (or plunger) rods is hinged a link 36, whose other end is connected to the arm 37 of a bell-crank lever 100 38. The horizontal arm of the bell-crank lever carries a weight 39, which acts to push the plunger back into the cylinder, and thus restore it and the signal to normal position,

say, of "danger." The pressure is removed from the inner end of the plunger by turning the cock 18, so as to close communication between the reservoir and the pipe 16 and open
 5 the pipe for the escape of its contents. In order to allow the movement of the valve 11 in the cylinder 12, ports 40 at the ends of the cylinder are provided, so as to allow the escape of the contents of the cylinder-chambers
 10 42 from before the advancing end of the valve or the entrance of the fluid from the pipe 21 or 22, as the case may be.

Inasmuch as the fluid used is generally liquid—such as water, oil, or glycerine—it is desirable that the exhaust-fluid should pass
 15 back into the supply-tank from which the pressure-reservoir 17 is charged, for in the event water is used the escaping water would in winter, if discharged in the vicinity of the
 20 apparatus, cause the latter to become coated with ice and thereby retard it in its operation, besides being objectionable for other obvious reasons, and in case oil or glycerine be employed it is obvious that too great an expense
 25 would be entailed by permitting it to waste at every operation of the device; hence I prefer to convey the exhaust-liquid away from the cylinder 12 and preserve it, so that it may circulate back and forth and be utilized for
 30 an indefinite number of operations; or it may at least, if not worth preserving, be discharged at the cock 18, so that it can run off into the gutter or sewer, where it will not interfere with the operation of the apparatus.

35 The operation of the device is as follows: The signal is supposed to be at its normal position of "danger," and if it be desired to indicate by means of the signal the actual position of the switch, communication is
 40 opened between the pressure-reservoir and the pressure-pipe 16. If the switch be in the position shown in Fig. 1, the fluid will pass from the chamber 14 through the conducting-pipe 21 to the cylinder 23, and the signal will be
 45 turned in the direction of the arrow, and will remain in this position as long as the pipe 16 is in communication with the reservoir. When this communication is closed and the fluid allowed to exhaust from the pipe 16, the
 50 weight 39 forces the plunger 25 into the cylinder and at the same time turns the signal back to its normal position. If the switch be in the opposite position, the pipe 22 will be in communication with the annular chamber
 55 14, and the signal will be turned in an opposite direction, when communication is opened between the reservoir and the pipe 16.

I claim—

1. The combination of the cylinder having the valve-ports 19 20 20 and the ports 40 40 60 connected to the ports 20 20, respectively, and leading from the ends of the cylinder, and a valve having a contracted waist fitting in said cylinder, substantially as and for the purposes set forth. 65

2. The combination of the cylinder 12, the valve 11, constructed substantially as set forth and connected by its stem to the moving rails of a railway-switch, a pressure-pipe 16 in communication with the chamber 14, 70 conducting-pipes 21 and 22, arranged communicating with the interior of the cylinder, on each side of the pressure-pipe, cylinders 23 24 in communication, respectively, with the conducting-pipes 21 22, plungers 25 and 26 75 within the cylinders, and cog-racks on the plungers engaging a cog-sector wheel on the signal-shaft, substantially as set forth.

3. The combination of a reservoir containing fluid, a pressure-pipe 16, leading from the 80 reservoir and containing the fluid under pressure, a cock or valve in the pressure-pipe 16 for the purpose set forth, two conducting-pipes 21 22, leading to cylinders, plungers working in said cylinders and carrying cog- 85 racks engaging a cog sector or wheel on the signal-shaft, a valve constructed to throw the pressure-pipe in communication with either of the conducting-pipes, and means, substantially as described, to force the plungers back 90 into the cylinders, for the purpose set forth.

4. The combination of the moving switch-rails 2, valve 11, connected to these rails 2, a pipe 16, containing fluid under pressure, conducting-pipe 21 22, cylinders 23 24, containing 95 plungers carrying cog-racks 28, a cog wheel or sector on a signal-shaft engaged by the cog-racks, a cock or valve 18 in the pipe 16, and a fluid-reservoir 17, all constructed and arranged to operate, substantially as set forth. 100

5. The combination, with the cylinders 23 24 and the fluid-pressure pipe, of the cylinder 12, having port 19 connected with said pipe, the ports 20 20, connected with the cylinders 23 24, respectively, and the ports 40 40, 105 connected to ports 20 20, respectively, and leading from the ends of the cylinder 12, a valve having a contracted waist fitted in cylinder 12, and an exhaust-cock in said pressure-pipe, substantially as set forth.

MORRIS WUERPEL.

In presence of—

SAML. KNIGHT,
 JOS. WAHLE.