

No. 823,609.

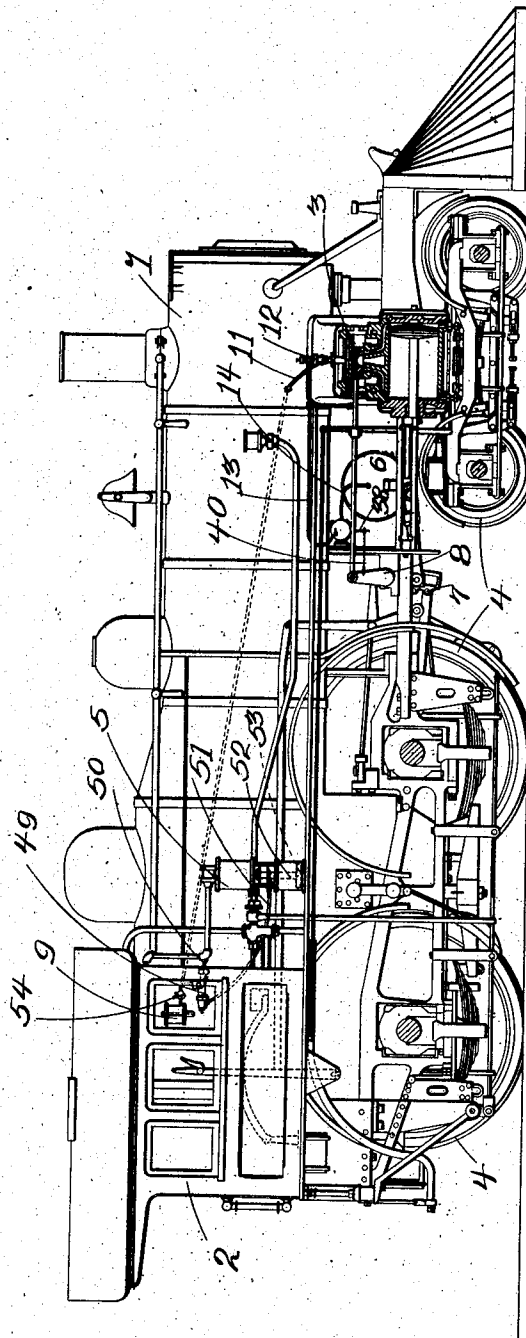
PATENTED JUNE 19, 1906.

C. W. MANZEL.
LUBRICATING SYSTEM FOR LOCOMOTIVES.

APPLICATION FILED JAN. 21, 1903.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses.

L. M. Sangster
Geo. A. Neubauer

Inventor.

Charles W. Manzel.
By *L. M. Sangster*

Attorney.

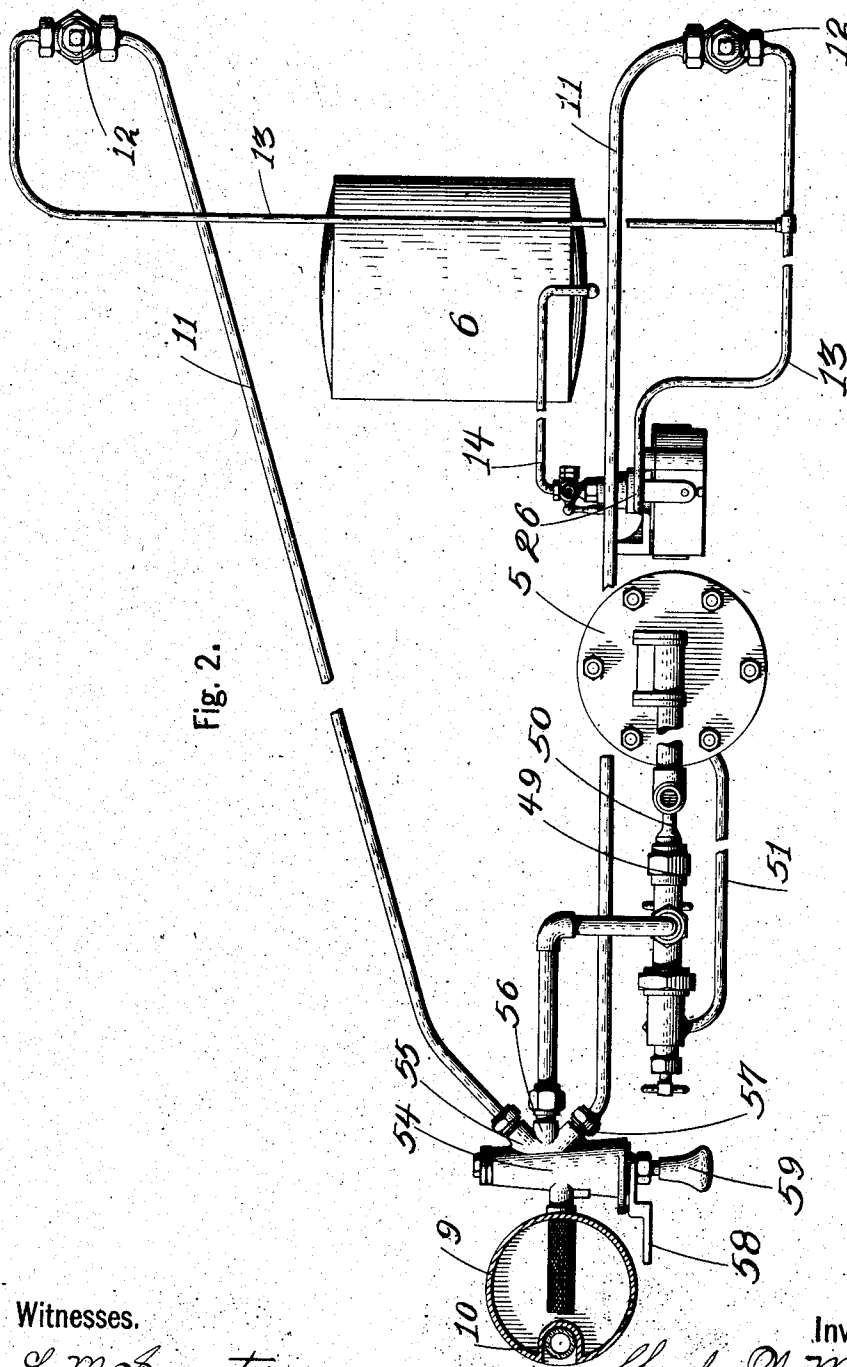
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Witnesses.

L. M. Sangster.
Geo. A. Neubauer.

Inventor.

Charles W. Manzel.
By
L. M. Sangster
Attorney.

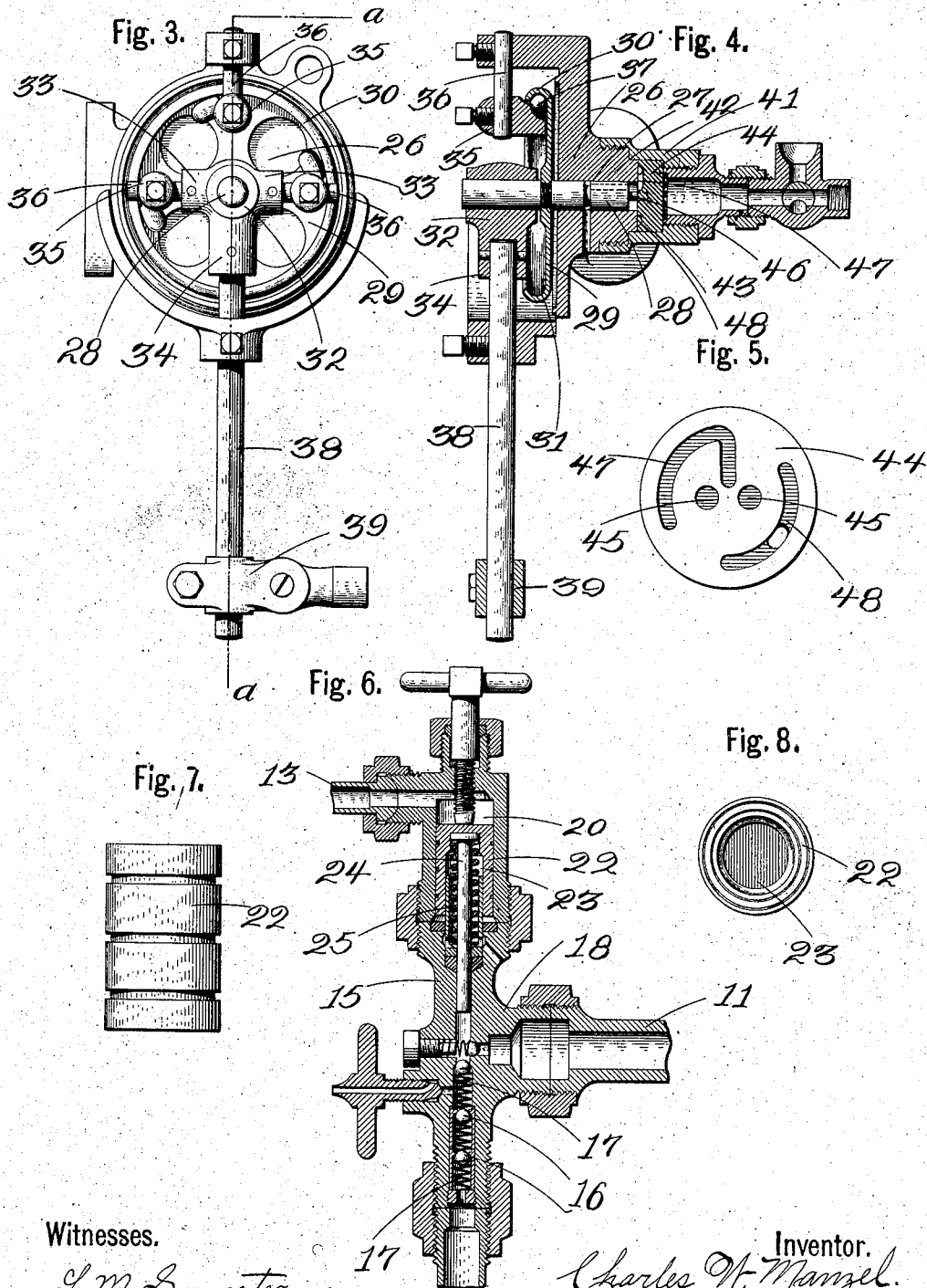
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3 SHEETS—SHEET 3.



Witnesses.

L. M. Sangster.
Geo. A. Neubauer.

Inventor.

Charles W. Manzel.
By
L. M. Sangster
Attorney.

UNITED STATES PATENT OFFICE.

CHARLES W. MANZEL, OF BUFFALO, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO MANZEL BROTHERS CO., A CORPORATION OF NEW YORK.

LUBRICATING SYSTEM FOR LOCOMOTIVES.

No. 823,609.

Specification of Letters Patent.

Patented June 19, 1906.

Application filed January 21, 1903; Serial No. 139,880.

To all whom it may concern:

Be it known that I, CHARLES W. MANZEL, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a certain new and useful Lubricating System for Locomotives, of which the following is a specification.

This invention relates to a lubricating system for locomotives or the like.

One of the features of the invention consists of one or more lubricating-pumps, compressed-air mechanism or the like for operating said pump or pumps, and a valve device controlling the supply of compressed air or other fluid which is operated from the motive power of the locomotive or other mechanism to be lubricated.

Another feature has reference to a manually-operative means, such as a hand-pump, for independently supplying oil to the lubricating pump or pumps, which is principally adapted to be used when the automatic air mechanism is not running or is unable to supply sufficient lubrication.

The object of the invention is to provide a simple, comparatively cheap, and efficient lubricating apparatus which will be operated automatically during the time the locomotive or other device is in motion and which may be manually operated independently at any time.

The invention also relates to certain details of construction, all of which will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a locomotive equipped with my improved lubricating system. Fig. 2 is a diagrammatic or plan view of the lubricating system separated from the locomotive. Fig. 3 is an enlarged detached side elevation of the friction mechanism and rotary valve. Fig. 4 is a central vertical section through the friction mechanism and rotary valve on line *a a*, Fig. 3. Fig. 5 is an enlarged detached face view of the rotary valve. Fig. 6 is a central longitudinal section through one of the lubricating-pumps. Fig. 7 is an enlarged detached side elevation of the piston-block. Fig. 8 is a bottom view of the piston-block.

In referring to the drawings in detail like numerals designate like parts.

This improved system comprises a lubricating mechanism, fluid-pressure mechanism for operating said lubricating mechanism, and a valve controlling the admission of fluid which is operated from the device requiring lubrication.

A hand-pump or similar manually-operative mechanism can be utilized in conjunction with the automatic fluid-pressure mechanism to provide an independent lubricating-feed to supplement the automatic feed.

The locomotive shown is of the usual construction and in part has the usual boiler 1, cab 2, steam-chests 3, wheels 4, air-brake pump 5, air-reservoir 6, valve-driving gear 7, and rocker-arm 8. In my improved system an oil-reservoir 9 is mounted on some convenient portion of the locomotive, preferably, as shown, on the end of the boiler 1 in the cab 2, and has the usual glass tube 10 for indicating the amount of oil in the reservoir. Pipes 11 connect the reservoir to lubricating-pumps, which are designated by the numeral 12 in Figs. 1 and 2 to indicate their proper location on said figures, and each of which is mounted on said locomotive and supplies oil to one of the steam-chests 3. These lubricating-pumps 12 are formed substantially as shown in Figs. 6, 7, and 8 and are designed to be operated by compressed air, being connected by pipes 13 to an air-valve, which in turn is connected by pipe 14 to the air-reservoir 6.

The preferred detail construction of the lubricating-pumps is fully set forth in a companion application covering the same, to which reference is to be had, as but a brief description of the vital parts will be set forth herein.

Referring to Fig. 6, the lubricating-pump shown consists of a body portion or main member 15, which is tubular in form and contains a series of ball-valves 16, normally held in their seats by springs 17, a lateral connection 18, which is coupled to an oil-pipe 11, and an upper air-chamber 20, which is connected by a pipe 13 to an air-valve, and has a piston-block 22, slidably mounted therein and provided with a recess 23, into which the upper end of the piston-rod 24 projects, being held therein by a spring 25. The action of this pump is such that when the air presses the block 22 down, it forces the piston toward

the ball-valves and feeds the oil. The supply of air to operate these pumps is controlled by a valve device which is operated from the motive power of the engine. This valve device is fully illustrated and described in a companion application, Serial No. 139,883, filed January 21, 1903, so that but a brief description will be required herein, reference being had to Figs. 3, 4, and 5. The valve device consists of a stationary body 26, which is fastened to a suitable point on the engine and has a central horizontal opening 27, in which a shaft 28 is journaled. A friction-disk 29 is mounted on said shaft and has a flange 30, which is provided with a groove 31 on its inner surface of curved cross section, substantially as shown in Fig. 4. A hub 32 is also mounted on the shaft which has three sockets 33 and 34, two of which are numbered 33 and extend oppositely to each other and the third of which is numbered 34 and extends at substantially right angles to the other two. (See Fig. 3.) A friction-block 35 is adjustably mounted on a short rod 36 and has a ball-wedging cavity in which a ball 37 is partially seated. Two of the rods 36 and blocks 35 are employed, and one of the rods 36 is fitted in each of the sockets 33 and projects therefrom. The balls 37 in the cavities of the blocks roll and wedge in the groove 31 in the flange 30. A comparatively long rod or lever 38 has its inner end fitted in the socket 34 and its outer end secured by a pivotal two-part clamp 39 to a connecting-rod 40, which in turn connects to the rocker-arm 8 of the locomotive or such other part of the same from which the proper motion can be secured. A tubular coupling 41 is fitted upon the reduced end 42 of the body 26 and has a chamber 43, in which a rotary valve-block 44 is fitted. This valve-block has two openings 45, in which pins 46, projecting from the inner end of the shaft 28, fit, and two elongated curved grooves 47 and 48 upon one of its faces, which form air-passages. The rotation of the block 44 alternately exhausts and replenishes the compressed air in the lubricating-pumps.

A lubricating-pump 49, similar to the pump 12, is mounted in the cab and connected by a pipe 50 to the air-pump of the locomotive, so as to lubricate the same. This pump is operated by compressed air supplied through a pipe 51, which is connected to the air-cylinder, reservoir, or tank 52 of the air-pump, so that the compression of the air in said cylinder by the compression-stroke of the piston 53 will operate the pump.

Hereinafter when I refer to the air "cylinder," "reservoir," or "tank" I wish it understood that I generically include by such terms all receptacles capable of containing air or other fluid under compression.

A hand-pump 54 is connected to the oil-reservoir 9 and has three connecting coup-

plings 55, 56, and 57, two of which connect to pipes 11, which supply oil to the lubricating-pumps 12, and the third to the suction-pipe 51 of the pump 49. This hand-pump is preferably located in the cab within convenient reach of the engineer (see Fig. 1) and has an adjusting mechanism, so that free passage through the pump into all the pipes extending to the lubricating-pumps may be provided when the hand-pump is not in use, or said passage may be closed and another and different passage to any one of the lubricating-pumps provided during the operation of the hand-pump.

The purpose of the hand-pump is to supply oil to the parts to be lubricated when the engine is stationary, to increase the supply of oil to any of the parts when necessary when the engine is traveling and to prime and thereby start the lubricating-pumps when first attached to the locomotive.

The adjusting mechanism of the hand-pump is operated by an adjusting-lever 58, and the pump is operated by the hand-rod 59. (Shown in Fig. 2.)

For a full and complete detail description of the hand-pump reference is to be had to the companion application covering the same, which was filed January 21, 1903, Serial No. 139,881.

It is to be understood that more or less lubricating-pumps may be used, and for some purposes the hand-pump may be entirely dispensed with, also various modifications within scope of the hereinafter-recited claims may be resorted to without departing from the invention.

I claim as my invention—

1. An automatic lubricating system for locomotives or the like, having a lubricating-pump, means for supplying oil to said pump, an air-cylinder connecting by piping to said pump and a valve controlling the air-supply and automatically operated from the motive power of the locomotive.

2. An automatic lubricating system for locomotives or the like having a lubricating-pump, compressed-air mechanism for operating said pump and a valve controlling the air-supply.

3. In an automatic lubricating system for locomotives or the like, the combination with an air-cylinder of a lubricating-pump, pipes connecting the air-cylinder to the lubricating-pump and a valve controlling the air-supply automatically operated from the motive power of the locomotive.

4. An automatic lubricating system for locomotives or the like having a lubricating-pump, an oil-reservoir, a pipe connecting the oil-reservoir to the lubricating-pump, an air-cylinder, a pipe connecting the air-cylinder to the lubricating-pump and a valve controlling the air-supply.

5. An automatic lubricating system for lo-

comotives or the like having a lubricating-pump, an oil-reservoir, a pipe connecting the oil-reservoir to the lubricating-pump, an air-cylinder, a pipe connecting the air-cylinder to the lubricating-pump and a valve automatically operated from the motive power of the locomotive and controlling the air-supply.

6. In a lubricating system for locomotives and the like, a plurality of lubricating-pumps, pneumatic mechanism for operating said pumps, an oil-reservoir, a hand-pump connecting to the oil-reservoir and pipes connecting the hand-pump to the lubricating-pump.

7. In a lubricating system, an air-pump, a lubricating-pump connecting to the air-pump, pneumatic mechanism for operating the lubricating-pump connected to the air-pump and a valve controlling said pneumatic mechanism automatically operated by the mechanism requiring lubrication, substantially as set forth.

8. In a lubricating system for locomotives and the like, a lubricating-pump connected with each steam-chest, a lubricating-pump connected with the air-pump, pneumatic mechanism for operating the lubricating-pumps connected to the steam-chests, a valve device controlling said pneumatic mechanism, mechanism for operating the pump for lubricating the air-pump, a hand-pump, an oil-reservoir, an oil-conducting pipe connecting the hand-pump to the oil-reservoir, and oil-conducting pipes connecting the hand-pump to all of the lubricating-pumps, substantially as set forth.

9. In a lubricating system for locomotives, an oil-reservoir, a hand-pump within convenient reach of the engineer, a pipe connecting the hand-pump to the oil-reservoir, a series of pneumatically-operated lubricating pumps and pipes connecting the lubricating-pumps to the hand-pump.

10. In a lubricating system for locomotives, an oil-reservoir, a hand-pump within convenient reach of the engineer, a pipe connecting the hand-pump to the oil-reservoir, a series of pneumatically-operated lubricating-pumps mounted on the steam-chests, a valve device controlling said lubricating-pumps, and a friction mechanism actuated from the motive power of the locomotive for operating the valve device.

11. In a lubricating system for locomotives, a lubricating-pump, pneumatic mechanism for operating said lubricating-pump, a valve device controlling said pneumatic mechanism, and a friction mechanism actuated from the motive power of the locomotive for operating the valve device.

12. In a lubricating system for locomotives, a lubricating-pump, pneumatic mechanism for operating said lubricating-pump, a valve device controlling said pneumatic mechanism, and means actuated from the

motive power of the locomotive for operating the valve device.

13. In a lubricating system for locomotives, a lubricating-pump, mechanism for operating said lubricating-pump, a valve device controlling said mechanism, and a friction mechanism actuated from the motive power of the locomotive for operating the valve device.

14. In a lubricating system for locomotives, an oil-reservoir a series of pneumatically-operated lubricating-pumps mounted on the steam-chests and connected to the oil-reservoir and a valve device controlling said lubricating-pumps.

15. In a lubricator, the combination with a reservoir, of a pump supplied from the reservoir, fluid-pressure mechanism for operating the pump, and a rotary valve actuated by the movement of the apparatus being lubricated for controlling the admission of fluid to the said mechanism.

16. In a lubricator, the combination with a reservoir, of a pump supplied from the reservoir, fluid-pressure mechanism for operating the pump, a valve for controlling admission of fluid to the said means, and a connection with apparatus being lubricated for imparting intermittent rotary movement to the valve.

17. In a lubricator, the combination with a reservoir, of a pump supplied from the reservoir, fluid-pressure mechanism for operating the pump, a source of fluid under pressure, a rotary valve for controlling admission of fluid to the said mechanism, and means for rotating the valve intermittently.

18. In a lubricator, the combination with a reservoir, of a pump supplied from the reservoir, fluid-pressure mechanism for operating the pump, a source of fluid under pressure, a rotary valve for controlling the admission of fluid to the said mechanism and an oscillating member for imparting intermittent rotary motion to the valve.

19. An automatic lubricating system for locomotives or the like having a lubricating-pump, means for supplying oil to said pump, fluid-pressure mechanism for operating said pump and a valve controlling the air-supply and automatically operated from the motive power of the locomotive.

20. In mechanism of the class described, a reservoir, a pump supplied from said reservoir, mechanism for operating said pump, and a valve device controlled by the mechanism requiring lubrication and in turn controlling the pump-operating mechanism.

21. In combination, an oil-pump, fluid-pressure mechanism for operating said oil-pump and a valve device actuated by the movement of the mechanism requiring lubrication for controlling the admission of fluid to said fluid-pressure mechanism.

22. In combination, an oil-pump, elastic

fluid-pressure mechanism for operating said oil-pump and a valve device actuated by the movement of the mechanism requiring lubrication for controlling the admission of elastic fluid to said fluid-pressure mechanism.

23. The combination with an oil-pump, of fluid-pressure mechanism for operating said oil-pump which is automatically controlled from the mechanism requiring lubrication:

24. The combination with an oil-pump, of fluid-pressure mechanism for operating said oil-pump which is automatically controlled from the mechanism requiring lubrication and a manually-operative device such as a hand-pump for independently operating said oil-pump.

25. In a lubricating system, an oil-pump, automatic means controlled from the mechanism requiring lubrication for operating said pump and manually-operative means for independently operating said pump.

26. In a lubricating system for locomotives, the combination with lubricating mechanism which is automatically operated, of manually operative means for independently operating said lubricating mechanism.

27. In a lubricating system for locomotives, the combination with lubricating mechanism, of mechanism for automatically operating said lubricating mechanism, and a hand-pump for independently operating said lubricating mechanism.

28. In a lubricating system for locomotives, the combination with lubricating mechanism, of fluid-pressure mechanism for automatically operating said lubricating mechanism and a hand-pump for independently operating said lubricating mechanism.

CHARLES W. MANZEL.

Witnesses:

L. M. SANGSTER,
GEO. A. NEUBAUER.