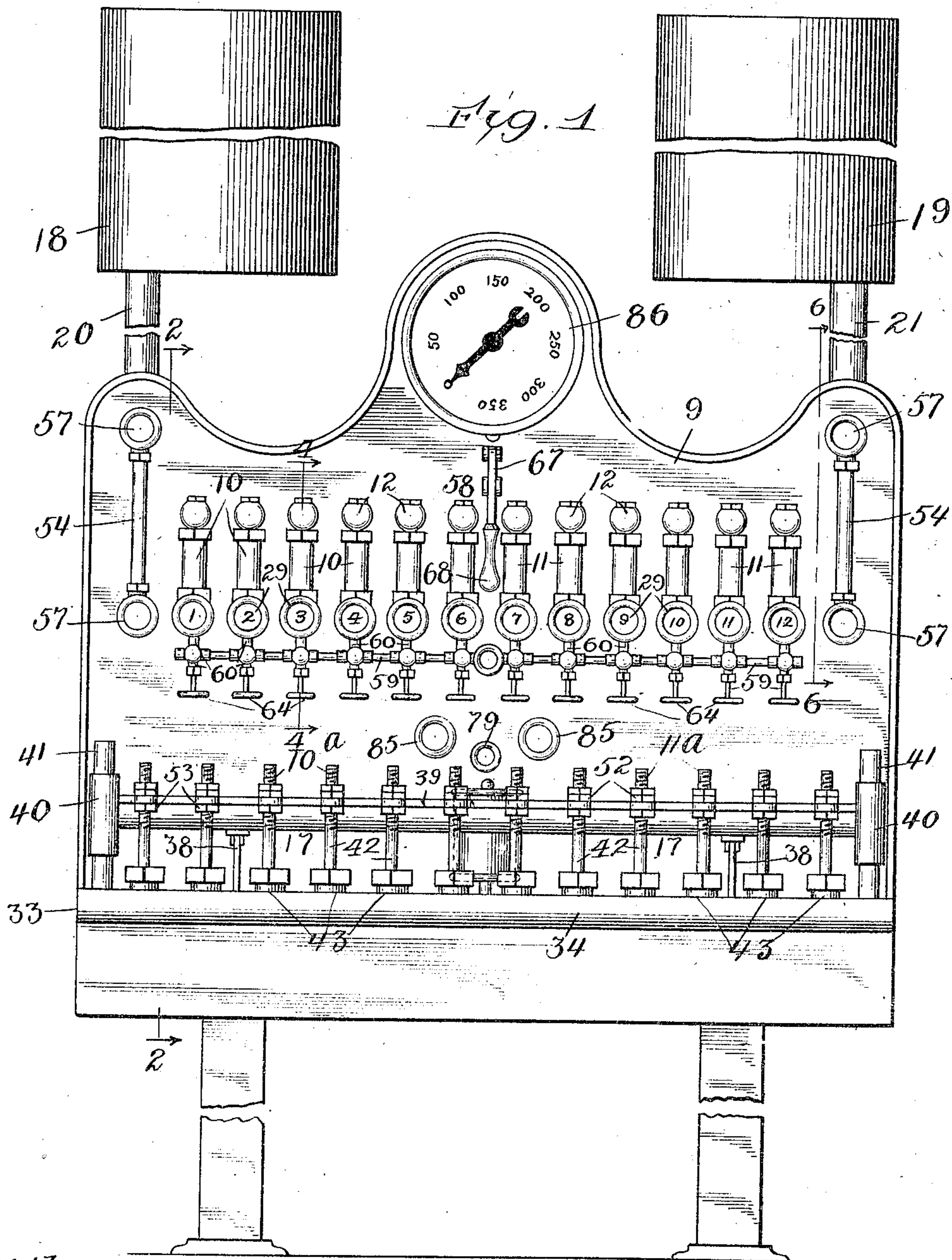


No. 861,756.

PATENTED JULY 30, 1907.

J. F. McCANNA.
LUBRICATING SYSTEM.
APPLICATION FILED JULY 25, 1904.

3 SHEETS—SHEET 1.



Witnesses:
Ray White,
Harry R. White.

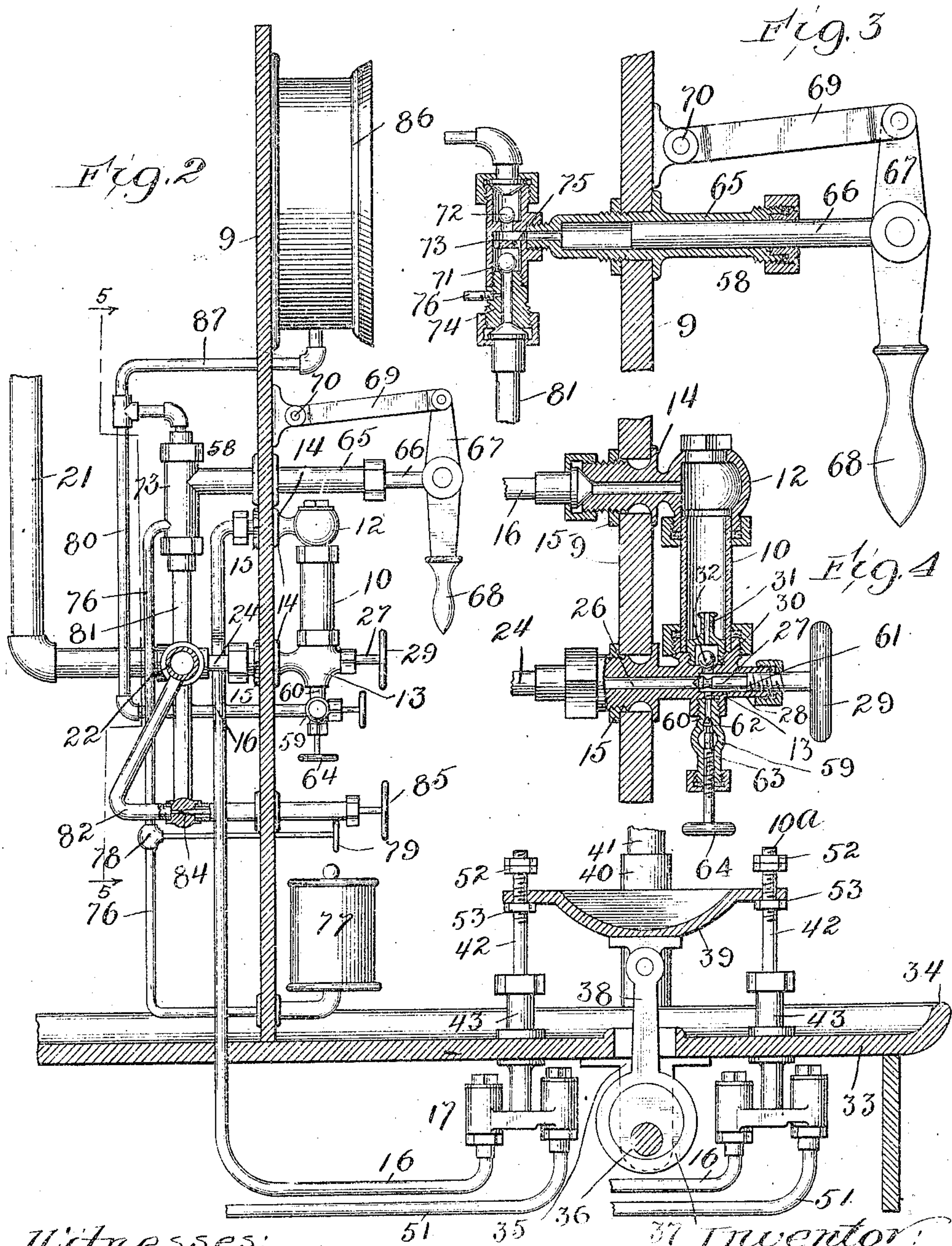
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3 SHEETS—SHEET 2.



Witnesses:

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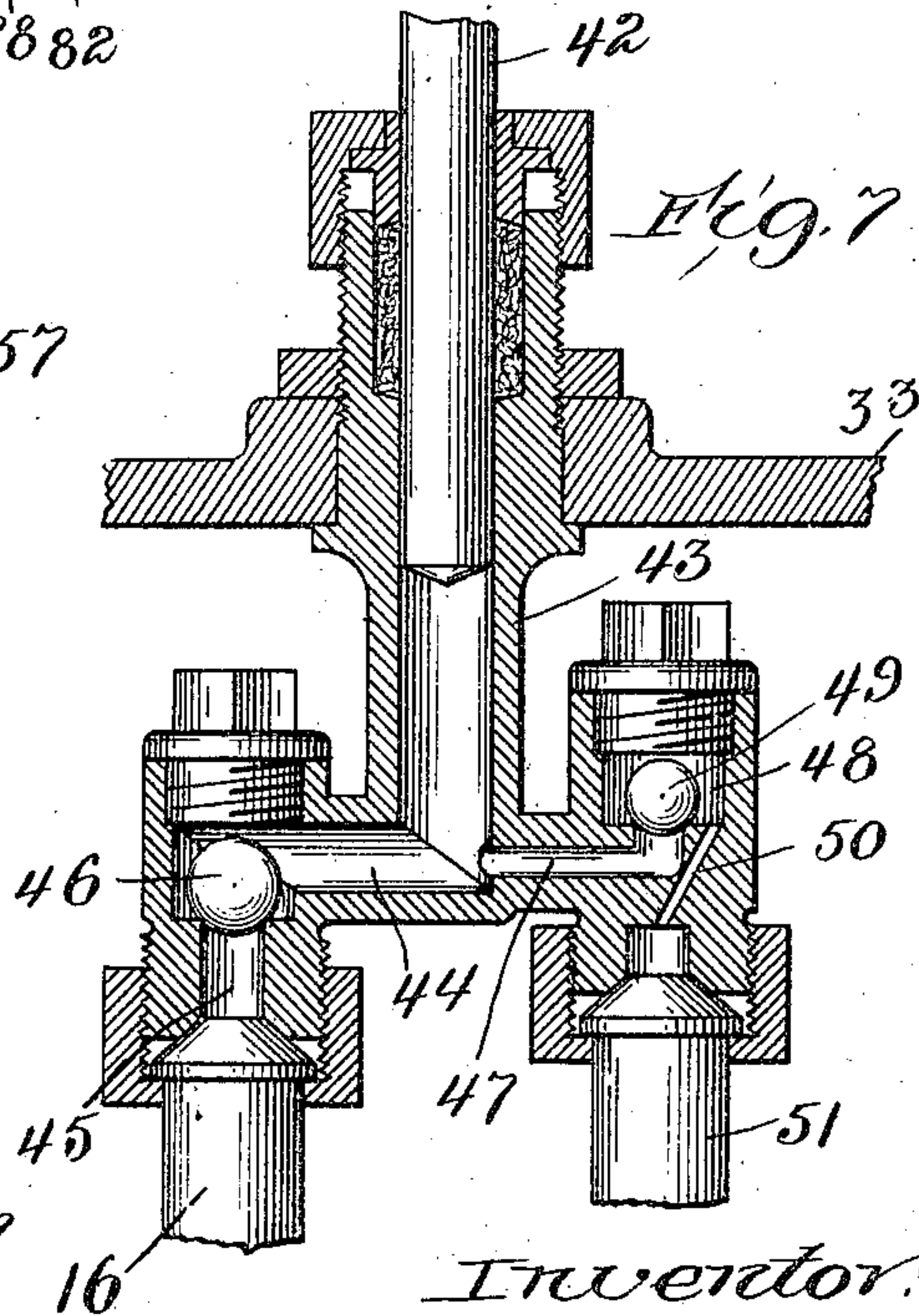
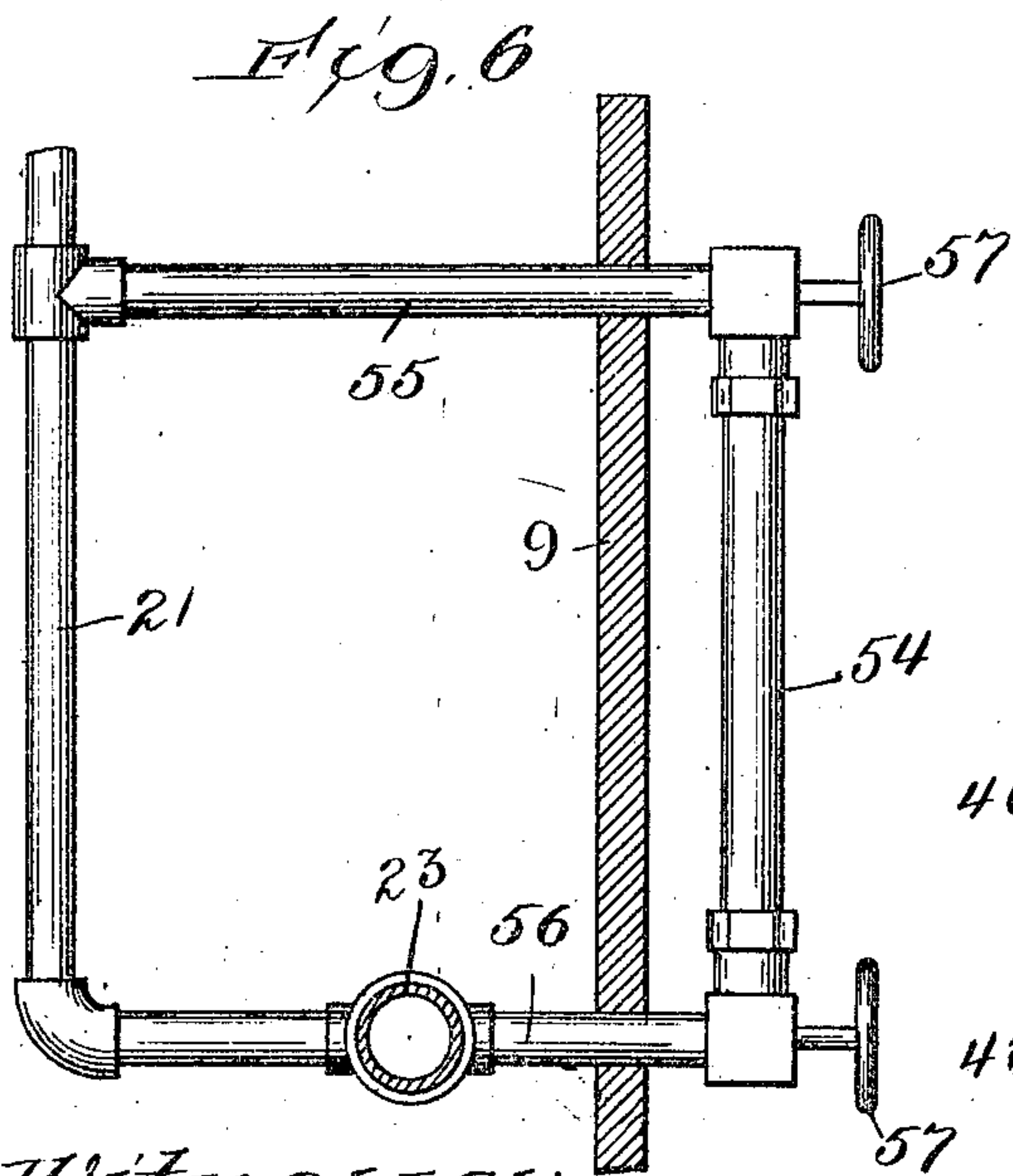
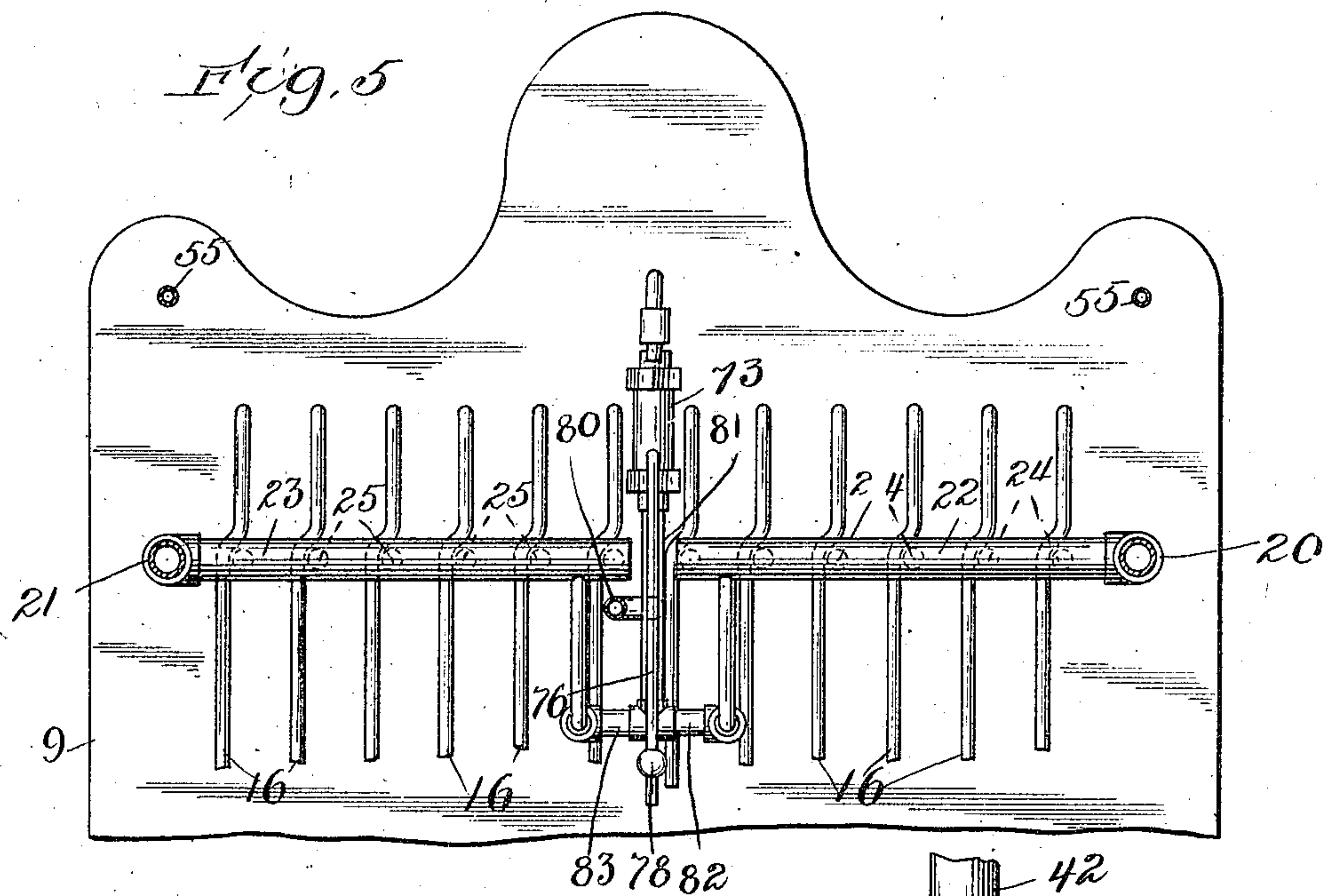
PATENTED JULY 30, 1907.

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LUBRICATING SYSTEM.

APPLICATION FILED JULY 25, 1904.

3 SHEETS—SHEET 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN F. McCANNA, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE JOHN F. McCANNA COMPANY,
OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

LUBRICATING SYSTEM.

No. 861,756.

Specification of Letters Patent.

Patented July 30, 1907.

Application filed July 25, 1904. Serial No. 217,944.

To all whom it may concern:

Be it known that I, JOHN F. McCANNA, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain
5 new and useful Improvements in Lubricating Systems, of which the following is a specification.

This invention relates primarily to a lubricating system, in which oil is forced through suitable connections from a plurality of sources of supply, containing
10 oil of different grades or kinds, to the different parts to be lubricated with the particular kinds or grades of oil contained in the sources of supply.

One of the objects of the invention is to provide a system in which the oil is delivered from a suitable
15 reservoir or reservoirs through suitable sight feed devices which are mounted on a common support or board and compactly assembled so as to be readily inspected by the attendant to determine the rate of feed and which is provided with means for controlling the sup-
20 ply to any bearing or part independently of the others.

The invention also contemplates the provision of a force feed lubricating system adapted to feed oil of different kinds or grades to certain of the parts to be
25 lubricated, and provided with a pump common to all of the reservoirs for forcing oil from any one of such reservoirs to the parts to be lubricated.

The invention has for a further object to provide means for charging the sight feed glasses with water by the common pump, the organization of the parts being
30 such that the pump may be placed in communication with a source of water supply or the source of oil supply, or any one of such sources in case the system is adapted to supply oils of different kinds or grades.

Other objects of the invention will be apparent from
35 the accompanying specification, in which the invention is fully described, and the appended claims in which the novelty of the invention is set forth.

Figure 1 is a front elevation of the invention showing the sight feed devices, pumps, and gages associated
40 therewith, assembled on a board; Fig. 2 is a section on the line 2—2 of Fig. 1; Fig. 3 is a detail sectional view of the auxiliary pump; Fig. 4 is a section on the line 4—4 of Fig. 1; Fig. 5 is a section on the line 5—5 of Fig. 2 showing the rear of the board; Fig. 6 is a section
45 on the line 6—6 of Fig. 1, and Fig. 7 is a detail sectional view of one of the pumps.

The apparatus may be mounted or assembled on any suitable support. In the present instance I have shown
50 the same as assembled on a board 9 mounted on suitable legs and which with the sight feed devices, valves, gage glasses, etc. presents somewhat the appearance and has some of the characteristics of a switchboard, the feeding of oil to any bearing being controlled and the rate of delivery of the oil being determined at such
55 board.

Mounted on the board are sight feed devices 10, 11, one of which is associated with each part or bearing being lubricated. Each feeding device 10, 11, in the present embodiment of the invention, consists, as
60 shown in Fig. 4, of a glass secured against leakage at its ends in the usual manner in an upper casing 12 and a lower valve casing 13, which casings pass through suitable apertures in the board 9, and are held in position by collars 14 and clamping nuts 15 as shown. Connections, such as the pipes 16, are coupled to the
65 casings 12, and lead to the pumps 17 each of the latter being connected by a pipe 16 with a particular sight feed glass.

In the embodiment of the invention illustrated provision is made for supplying oil of different kinds or
70 grades, the oil drawn from one source of supply passing through certain of the sight feed glasses while the oil from another of the sources of oil supply passes through other sight feed glasses. In the present instance the system is adapted to feed two kinds or grades of oil, al-
75 though it is to be understood that the system may be extended so that any number of kinds or grades of oil may be supplied thereby. As shown in the drawings two reservoirs are provided, one of which, as 18, may
80 contain engine oil, while the other, as 19, may contain cylinder oil, assuming that the board is located in an engine room and the system designed to lubricate the engine cylinders and other parts. The reservoirs 18 and 19 are preferably located in an elevated position as shown and are supplied with outlet pipes 20, 21, which
85 enter headers or auxiliary reservoirs 22, 23, horizontally disposed at the back of the board 9, the header 22 being located back of the sight feed glasses 10 and the header 23 back of the sight feed glasses 11, as shown in Figs. 2 and 5. Leading from the header 22 to the valve
90 casing 13 of each of the sight feed glasses 10 is a connection 24 Figs 2, 4, and 5, while a similar connection 25 leads from the header 23 to the valve casing 13 of each of the sight feed glasses 11 as indicated in dotted lines in Fig. 5. As shown in Fig. 4 each valve casing 13 is pro-
95 vided with a horizontal passage 26 which is closed by a screw valve 27 the stem of which is in threaded engagement with a sleeve 28 projecting in front of the board and is provided with a hand wheel 29. Leading from the passage 26 is an upward duct 30 which discharges to
100 a reducing nozzle 31 screwing on to the casing 13 and having a chamber at its lower end in which is located a check valve 32 adapted to seat over and on the outlet of the duct, as shown. By means of the valve 27 with which each sight feed glass is provided, the feeding of
105 oil to any bearing may be stopped at will simply by screwing up such valve.

As has already been pointed out each pipe 16 leads to an individual pump for supplying oil to a bearing or
110 other part to be lubricated, there being as many pumps

as used are sight feed glasses. These pumps may be of any suitable or preferred character and operated in any desired manner.

In the construction illustrated the pumps are supported by a table or ledge 33 located under the feed board and provided with a rib or flange 34 to form of the table a drip pan. Mounted in suitable bearings 35 depending from the table and one of which is shown in dotted lines in Fig. 2, is an eccentric shaft 36 with which coöperates sleeves or yokes 37 provided with links 38 pivotally connected at the upper ends to a cross head 39, extending as shown in Fig. 1, substantially the length of the table 33. This cross head is provided at its ends with sleeves 40 adapted to slide on and be guided by vertical rods 41 on the ends of the table. Attached to the cross head 39 are the pump plungers 42 the barrels 43 extending through the table, as shown in Figs. 2 and 7; and being suitably secured in position as shown. The barrel of each pump communicates with a horizontal passage 44 having an inlet 45 to which the pipe 16 of the associated gage glass is connected, such inlet being adapted to be closed by a suction valve 46; and the pump discharges by a passage 47 entering a chamber 48 containing a check valve 49. Ducts 50 conduct the oil from the chamber 48 to the tube or connection 51 leading to the part supplied with oil by such pump. Each pump plunger is provided with a pair of abutments 52, 53 with which the cross head coöperates to reciprocate the plungers, and one of the abutments on each plunger, as 52, is adjustable, being in the present instance in the form of a nut threaded upon the plunger. By screwing the nut up or down lost motion between the cross head and the plunger may be varied or entirely eliminated, so as to vary the stroke of the plunger and consequently the quantity of oil delivered thereby, and by this means, although all of the pumps are operated by the same cross head, the stroke of each one may be varied independently of the others. These pumps as shown in Fig. 1 are disposed under the sight feed glasses and the latter may be provided with identifying marks, such as numbers as shown to correspond with similar numbers on or near the pumps, so that the attendant may see at a glance, on observing the rate of feed through any glass, the particular pump to be adjusted if this rate of speed should be changed.

In the construction illustrated each group of sight feed glasses 10 and 11 contains six glasses, the glasses 10 being associated with the six pumps designated 10^a while the glasses 11 are designed to coöperate with the pumps 11^a. However, the system may be reduced or extended simply by varying the number of pumps and sight feed glasses and necessary connections, and if extended the additional pumps may be operated by the cross head 39 as shown in Fig. 1.

From the foregoing it will be understood that upon the operation of the pumps 10^a and 11^a the oil will be drawn from the reservoirs 18 and 19, through the headers 22, 23 and from the latter to the sight feed glasses associated with each header, and rise in drops from the nozzles 31 up through the water in the sight feed glasses, thence by the pipes 16 to the pumps, being finally conducted to the parts being lubricated by the pipes 51. This is the normal operation of the system. Located at suitable positions on the board 9 are gage glasses 54 to indicate when the supply of oil in each

reservoir is nearly exhausted, and in the embodiment of the invention illustrated these gages are located near the upper corners of the board, the upper end of each being connected by a tube 55 to one of the pipes 20 or 21 while the other end communicates by a pipe 56 with one of the headers, as 23. These gages are provided with the usual valves 57 to shut off the oil in case of breakage of the glasses or for other reasons.

In order to originally charge or to replenish the sight feed glasses in case the water therein becomes exhausted I provide the following mechanism: Mounted on the board 9 in a convenient position, as between the series of sight feed glasses 10 and 11, is an auxiliary pump, such as the hand pump 58 shown, which is employed for the purpose of charging the sight feed glasses with water, but which may also be employed for furnishing additional oil to the parts being lubricated. Extending across the front of the board is a tube or header 59 from which extends a series of connections 60 leading into each sight feed glass. Each connection 60 registers with a duct 61 entering the passage 26 of each casing 13, in front of the valve 27 when the latter is closed, and which duct is adapted to place the connection 60 in communication with the sight feed glasses by way of the duct 30. The stem of the valve 27 is reduced, as shown in Fig. 4, to permit the fluid to pass around the same to the duct 30. Each connection 60 is adapted to be closed by a screw valve 62, the stem of which passes through and is in threaded engagement with a depending sleeve 63 on the header and has a handle or wheel 64 thereon.

The barrel 65 of the auxiliary pump projects through the board 9, as shown in Fig. 3, the plunger 66 of the same being pivotally connected to a lever 67 having a depending handle 68 and the upper end of which is pivoted to a link 69 pivotally attached, as at 70, to the board. The pump barrel is provided with a suction valve 71 at its inlet, and a check valve 72 at its outlet, the said valves being located in a casing 73 connected to the pump barrel as shown in Fig. 3. Screwing into the lower end of the casing 73 is a nipple 74, and the valve 71 is seated on and closes the passage through the same, an apertured web 75 above the valve serving to maintain the same in its proper position. Entering the nipple 74 is a pipe 76 which leads from a suitable source of water supply, such as a tank 77 which may be located on the table as shown in Figs. 1 and 2. The pipe 76 is provided with a valve 78 adapted to close the passage through the same. The stem of the valve 78 extends through the board 9 and is provided with a hand wheel 79, as shown. Connecting with the discharge of the pump 58 is a tube 80 which communicates with the header 59.

To originally charge or to replenish the sight feed glasses, the valve in the pipe 76 is opened as are also the valves 62 of the sight feed glasses, the valves 27 being closed. The hand pump is then operated drawing up water from the water tank 77, and forcing the same through the pipe 80 into the header 59, the water finally entering into the sight feed glasses until the latter are filled. In case certain of the sight feed glasses are already partially filled, by means of the valve 62 associated with each of said sight feeding glasses the supply to such sight feed glass may be stopped at any time while the other sight feed glasses

having their valves still opened are continued to be supplied with water until charged to the desired height. By this arrangement of valves, each sight feed glass having a connection with the common header 59, any one may be charged or entirely filled if the water is partially exhausted without affecting the other sight feed glasses. The check valve 32 in the bottom of each sight feed glass prevents the water therein from flowing back to the pump or into the reservoirs. As soon as the sight feed glasses have been charged the valves 62 of all the sight feed glasses are closed and also the valve in the connection 76 leading to the pump, and the valves 27 again opened. The hand pump also affords means for forcing the lubricant contained in either reservoir 18 or 19 to the parts to be lubricated when, for example, the pumps 10^a and 11^a are out of order or when for other reasons it is not desired to operate these pumps. To this end a common inlet to the pump, such as the tube 81, is provided, and leading to this common inlet tube are connections 82, 83 one of which communicates with each of the headers or auxiliary reservoirs 22, 23 as shown in Fig. 5. Each of the connections 82, 83 is provided with a valve, such as the screw valve 84 shown in Fig. 2, the stem of which passes through a sleeve extending through the board 9, and is provided with a hand wheel 85 as shown in Fig. 2. The outlet of the pump 58 when used for forcing oil is the same as that heretofore described in connection with the mechanism for supplying the sight feed glasses with water, to-wit, the tube 80 entering the common header 59. By this arrangement communication may be established, by means of the valves 84, between the auxiliary pump and either source of oil supply. For example, assuming that oil is to be drawn from the reservoir 18, the valve in the connection 83 is closed while the valve in the connection 82 is opened. The hand pump being operated oil is sucked from the auxiliary reservoir 22 through the connection 82 to the common inlet pipe 81 of the pump and then forced by way of the pipe 80 into the header 59 up through the sight feed glasses and through the pipes 16 through the pumps 10^a, 11^a, and to the parts to be lubricated. As each of the sight feed glasses is provided with a valve 62 for closing the connection between the header 59 and such sight feed glass, the passage of oil through any sight feed glass may be shut off at will and when oil is being drawn from one source of oil supply the sight feed glass associated with the other source of oil supply may be closed by means of the valves thereof so that the oil, depending on its character, may be forced only to the bearings associated with the sight feed glasses of the main reservoir containing such oil. The operation is the same when oil is drawn from the reservoir 19, in which case the valve in the connection 83 is opened while the valve in the connection 82 is closed. When the oil is being delivered by the pumps 10^a, 11^a alone, both valves 84 are closed.

In the case of a hot bearing, if it be desired to cool it off with water, connection may be readily established therewith by means of the various valves, and by opening the valve 78 in the water pipe 76 and operating the hand pump water may be forced to such bearing. Also by means of the construction disclosed, another kind of oil than that usually supplied to any

particular bearing may be forced to that bearing in the event that this is desired. The main pumps 10^a and 11^a are designed to be operated with a slow motion so as to feed the oil slowly to the bearings and the hand pump therefore affords means for supplying oil to the bearings in greater quantities, as the handle thereof may be operated rapidly by hand, when it is desired to flush the bearings as, for example, when the machinery has been out of service for some time. If after charging the sight feed glasses with water, the hand pump is employed to feed oil to the bearings, the water above the valve 78 will be forced to the bearings thereby clearing the system of the excess water.

The invention described provides a simple and compact system which under normal conditions is adapted to supply oil by means of an individual pump associated with each sight feed glass and also whereby when these pumps are out of operation oil may be forced to the bearings by a pump common to both reservoirs, such pump also being so arranged and associated with the other parts as to adapt the same to the charging of the sight feed glasses with water.

The handles of the valves 78 and 84 are preferably grouped close together near the center of the board, as shown in Fig. 1, so as to be readily operated by the attendant, and all of the valves and other parts, such as the sight feed glasses, gages, and auxiliary pumps are placed within convenient reach of and so as to be readily observed by the attendant.

Mounted on the board in a convenient position, as for example, above the sight feed glasses, as shown in Fig. 1, is a pressure gage 86 having a connection with the discharge of the hand pump, as by means of a tube 87 connecting with the pipe 80. This gage serves to indicate the pressure on the lubricant so that it may be determined by a glance if there is any obstruction in or leakage of the pipes, and also by the fluctuation of the needle that the oil is feeding.

Having described my invention what I claim is

1. In an apparatus of the class described, in combination, a series of sight feed devices, a reservoir, a check valve controlled connection between the reservoir and each sight feed device, connections between the sight feed devices and associated parts to be lubricated, and a pump in each of such latter connections drawing oil from the reservoir through the sight feed and forcing it to a part to be lubricated.

2. In an apparatus of the class described, the combination with a series of vertical sight feed glasses each of which is provided with a check valve at the bottom, a reservoir and connections leading therefrom discharging into the sight feed devices below the valves, a series of pumps drawing oil from the reservoir through the sight feeds and forcing it to the parts to be lubricated, and a connection leading from the outlet of each sight feed glass to one of the pumps.

3. In an apparatus of the class described, the combination with a series of fluid containing sight feed glasses, of an auxiliary reservoir, a connection between the auxiliary reservoir and each sight feed glass, a main reservoir for supplying oil to the auxiliary reservoir, a series of pumps drawing oil from the reservoir through the sight feed, and forcing it to the parts to be lubricated, and a connection leading from the outlet of each sight feed glass to an associated pump.

4. In an apparatus of the class described, the combination with a series of fluid containing sight feed glasses, of an auxiliary reservoir, a check valve controlled connection between the auxiliary reservoir and each sight feed glass, a main reservoir for supplying oil to the auxiliary reservoir, a series of pumps, connections between the pumps

and the outlets of the sight feed glasses whereby the pumps draw oil through the sight feeds, and means for varying the stroke of each pump independently of the others.

- 5 5. In an apparatus of the class described, the combination with a series of sight feed glasses, means for feeding oil through the sight feed glasses to the parts to be lubricated, and a pump common to the sight feed glasses for supplying water thereto.
- 10 6. In an apparatus of the class described, the combination with a series of sight feed glasses, means for drawing oil through the sight feed glasses to the parts to be lubricated, an oil reservoir, connections leading to the sight feed devices from the reservoir, valves for closing the connections, a pump, a water supply pipe leading to the pump, a header, a connection between the header and each sight feed glass, and a connection leading from the discharge of the pump to the header.
- 15 7. In an apparatus of the class described, the combination with a board having a series of sight feed glasses mounted thereon, means for drawing oil through the sight feed glasses to the parts to be lubricated, an oil reservoir, connections between the reservoir and the sight feed glasses, manually controlled valves in such connections.
- 20 8. In a lubricating system, the combination with a fluid containing sight feed device, a lubricant supply connection leading thereto and provided with a check valve, a pump for delivering the lubricant to the part to be lubricated, an auxiliary pump, a fluid supply connection therefor, and a valve controlled connection leading from the auxiliary pump to the sight feed device.
- 25 9. In an apparatus of the class described, the combination with a series of sight feed glasses, a plurality of reservoirs, connections between each reservoir and certain of the sight feed glasses, connections adapted to convey the oil from the sight feed glasses to the parts to be lubricated, a pump interposed in each of the latter connections, a header, connections between the header and each sight feed glass, an auxiliary pump, a valve controlled connection for supplying oil to the auxiliary pump from each reservoir, and a connection between the auxiliary pump discharge and the header.
- 30 10. In a lubricating system, the combination with a reservoir, a sight feed glass, a connection leading from the reservoir to the glass, piping for conducting lubricant from the glass to the part to be lubricated, a pump interposed in such piping, of an auxiliary pump, a pipe leading from the said connection to the auxiliary pump and provided with a controlling valve, and a pipe for conducting lubricant from the auxiliary pump to the sight feed glass.
- 35 11. In a lubricating system, the combination with a reservoir, a series of sight feed glasses, a connection for conducting lubricant from the reservoir to each glass, a check valve in such connection, piping for conducting lubricant from the glasses to the parts to be lubricated, pumps interposed in the piping, of an auxiliary pump, a pipe for conducting lubricant from the reservoir supply to the auxiliary pump and provided with a controlling valve, and a connection for conducting lubricant from the auxiliary pump to the glasses.
- 40 12. In a lubricating system, the combination with a source of lubricant supply, a sight feed device, and a pump normally operated to pass lubricant through the sight feed device to the part to be lubricated, of an auxiliary pump communicating with the source of lubricant supply, and a connection between such pump and the sight feed device.
- 45 13. In a lubricating system, the combination with a plurality of sources of oil supply, said sources containing oils of different kinds, and pumps certain of which are provided with connections with each of said sources of oil supply, of an auxiliary pump adapted to be placed in communication with either of said sources of oil supply, and a header into which the auxiliary pump discharges and which communicates with all of the said connections.
- 50 14. In a lubricating system, the combination with a plurality of sources of oil supply, said sources containing oil of different kinds, a series of sight feed devices, connections between each source of oil supply and certain of the sight feed devices, and pumps normally operated to deliver the oil to the parts to be lubricated, of a manually operated pump adapted to be placed in communication with either source of oil supply, a header communicating with the discharge of the said pump, a connection between the header and each sight feed device, and a manually operated valve in each of such latter connections.
- 55 15. In an apparatus of the class described, the combination with a series of sight feed glasses, a series of pumps and connections between the outlets of the sight feed glasses and the pumps, a plurality of main reservoirs, an auxiliary reservoir associated with each main reservoir and having a connection therewith, valve controlled connections between each auxiliary reservoir and certain of the sight feed glasses, a header, a valve controlled connection between the header and each sight feed glass, an auxiliary pump, a pipe leading from the auxiliary pump discharge to the header, and a valve controlled connection for conducting oil drawn from each main reservoir to the auxiliary pump.
- 60 16. In an apparatus of the class described, the combination with a board having a series of sight feed glasses mounted thereon and provided with check valves at the inlets thereof, means for normally forcing oil to the parts to be lubricated and having connection with the sight feed glasses, a plurality of main reservoirs, an auxiliary reservoir located back of the board and associated with each main reservoir and having a connection with such main reservoir, connections between each auxiliary reservoir and certain of the sight feed glasses, a header, a connection between the header and each sight feed glass, a manually operated valve in each of the latter connections, an auxiliary pump, a pipe leading from the pump discharge to the header, a connection for conducting oil from each main reservoir to the pump, and a manually operated valve in each connection and the stem of which extends in front of the board.
- 65 17. In an apparatus of the class described, the combination with a series of sight feed glasses, each of which is provided with a check valve at its inlet, means for normally forcing oil to the parts to be lubricated and having connections with the sight feed glasses, a plurality of reservoirs each of which is provided with connections to certain of the sight feed glasses, a header, a connection between the header and each sight feed glass, a manually operated valve in such connection, a pump, a pipe leading from the pump discharge to the header, connection for conducting oil supplied by each reservoir to the pump, a water supply connection leading to the pump, and a manually operated valve in each of the connections leading to the pump.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN F. McCANNA.

Witnesses:

ARTHUR B. SEIBOLD,
ELIZABETH MOLITOR.