No. 891,785. PATENTED JUNE 23, 1908.

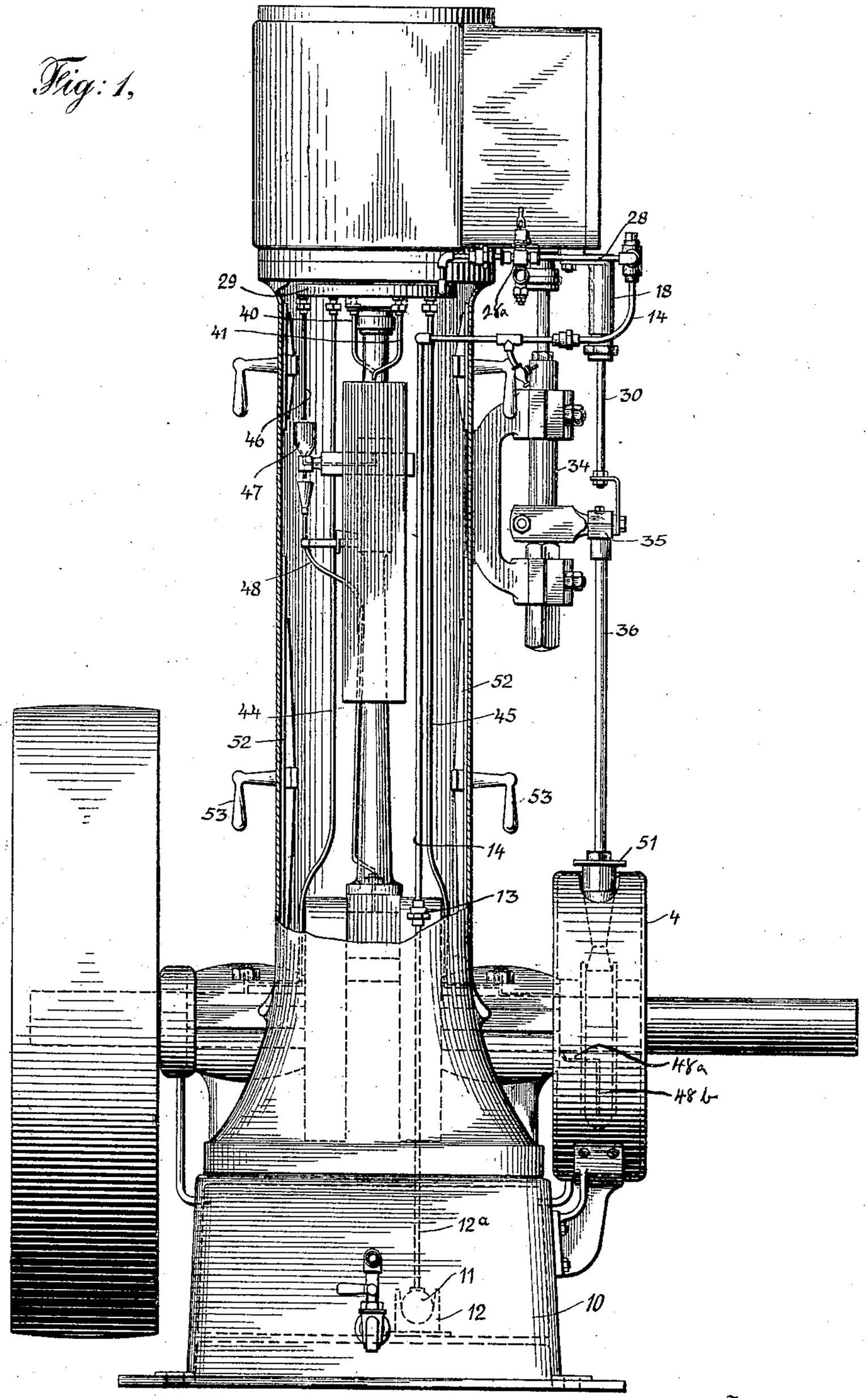
M. W. SMITH.

OILING SYSTEM FOR ENGINES.

APPLICATION FILED JULY 9, 1907.

3 SHEETS—SHEET 1.

Fig: 1.



Witnesses:
Mar. B. A. Doring
A. Newcomb

Inventor
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Prindle and Williamson.

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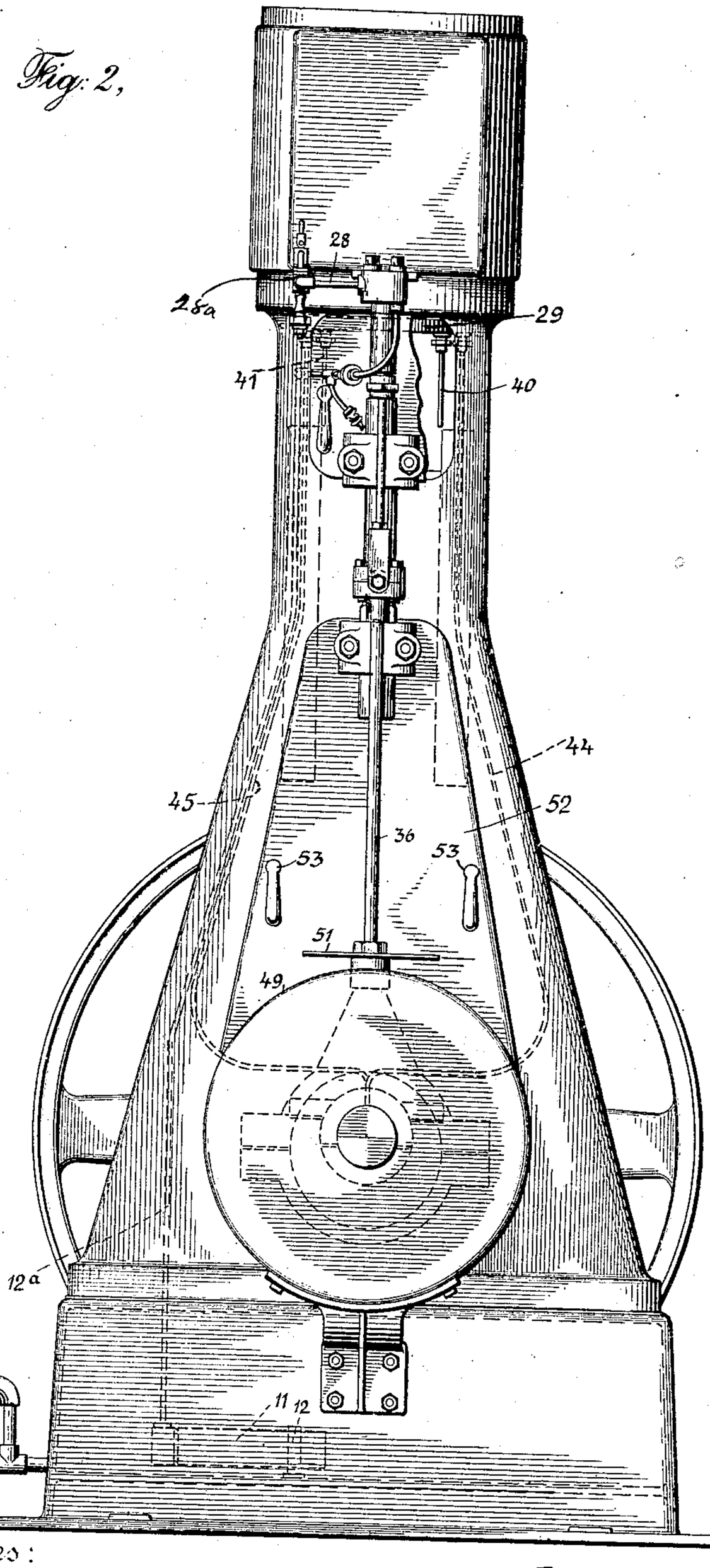
3 SHEETS—SHEET 2.

Fig. 2,



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3 SHEETS—SHEET 3.

Fig: 3,

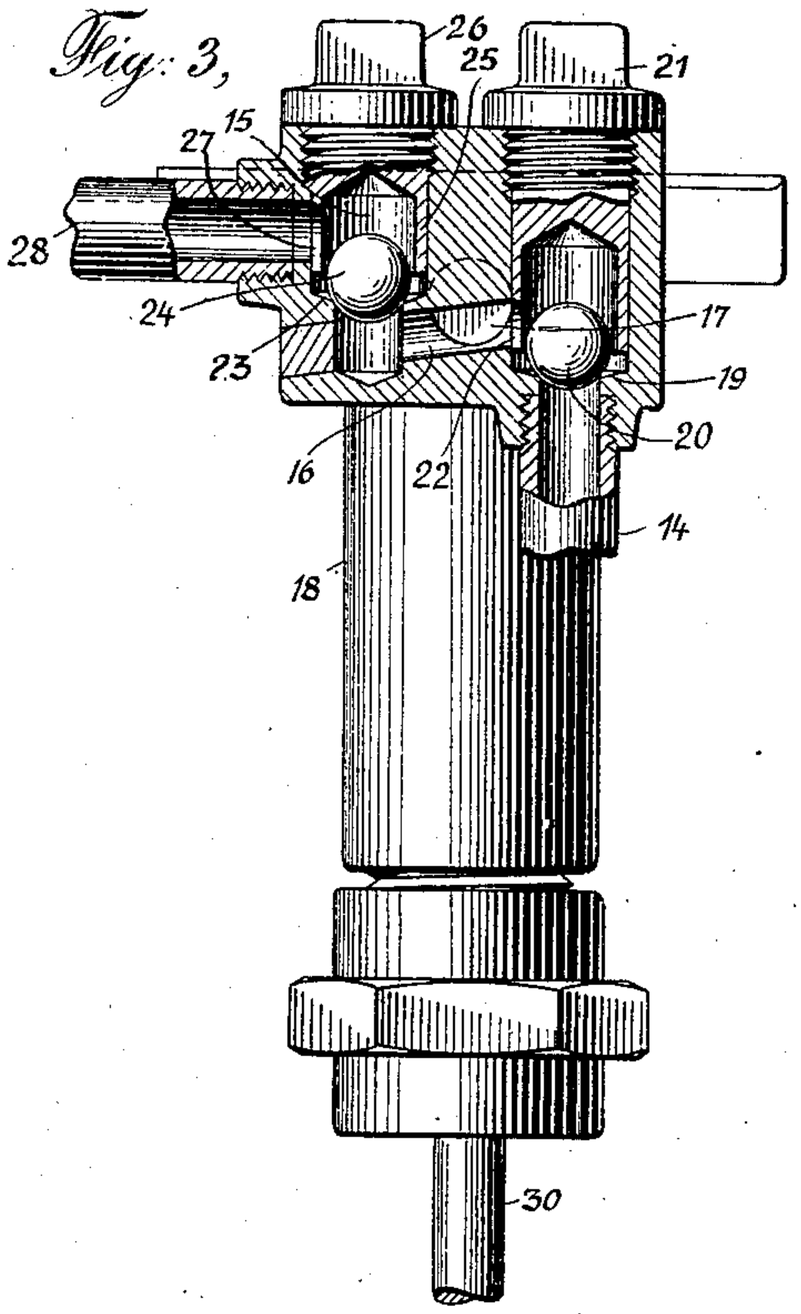


Fig: 4,

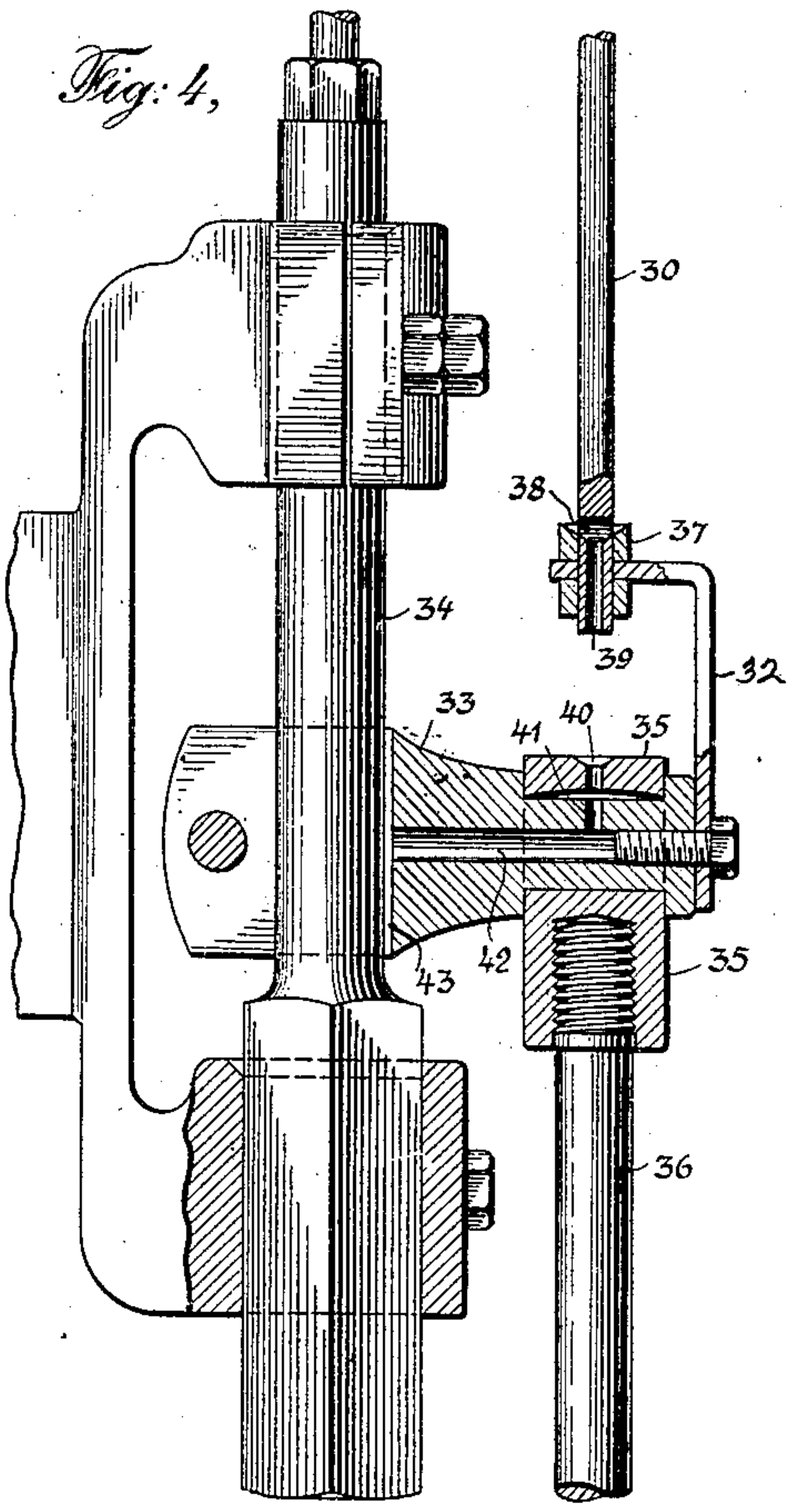


Fig: 5,

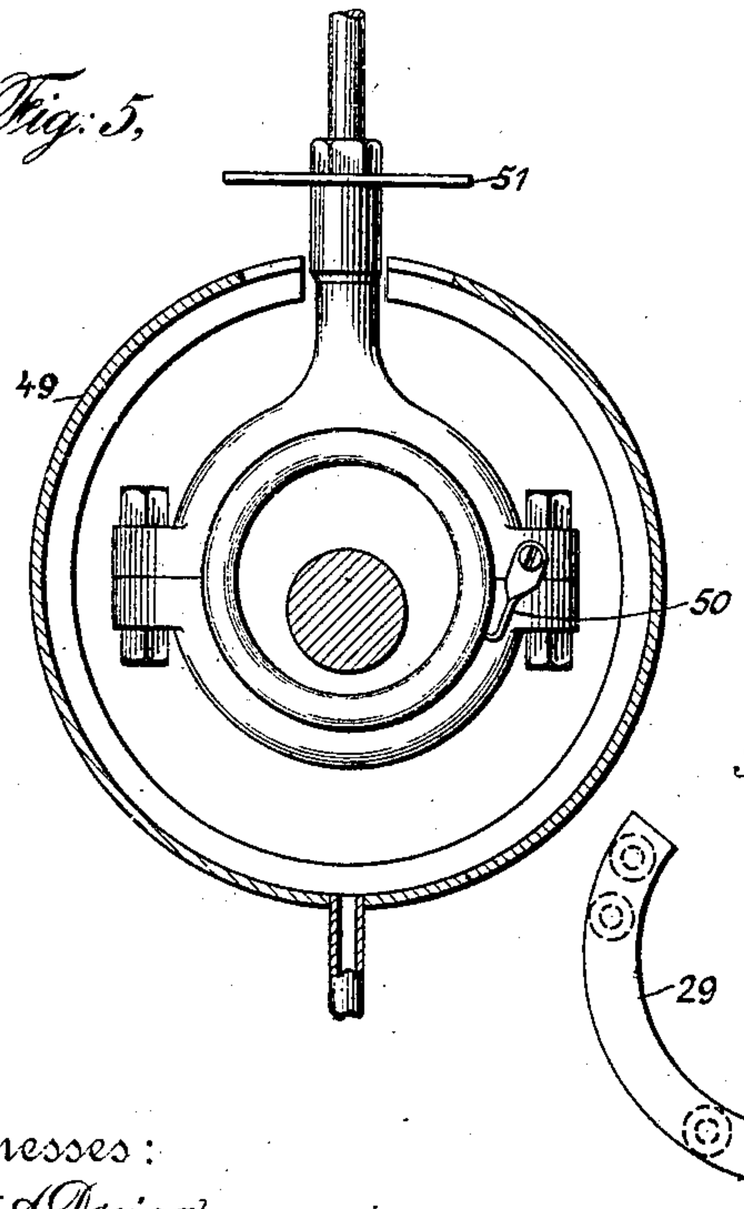


Fig: 6,

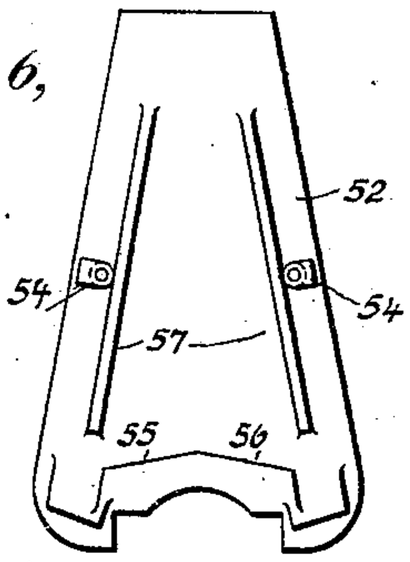
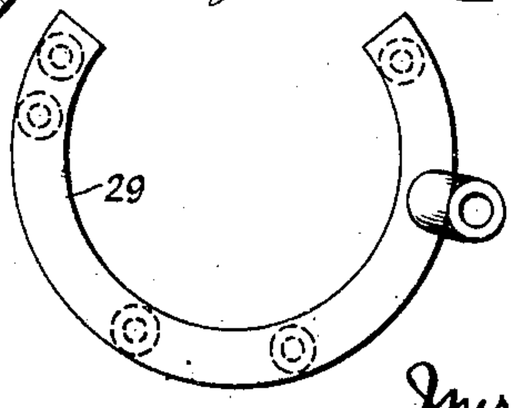


Fig: 7.



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UNITED STATES PATENT OFFICE.

MERRITT W. SMITH, OF TROY, PENNSYLVANIA, ASSIGNOR TO JOHN A. PARSONS, OF TROY, PENNSYLVANIA.

OILING SYSTEM FOR ENGINES.

No. 891,785. Specification of Letters Patent. Patented June 23, 1908.

Application filed July 9, 1907. Serial No. 382,925.

To all whom it may concern:

Be it known that I, MERRITT W. SMITH, of Troy, in the county of Bradford and in the State of Pennsylvania, have invented a certain new and useful Improvement in Oiling Systems for Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figures 1 and 2 are respectively side and front elevations of an engine embodying my invention; Fig. 3 is a sectional view of the valves of the oil pump; and Figs. 4, 5 6 and 7 are detailed views.

The object of my invention has been to provide a system for oiling engines, which shall have, among others, the following advantages: that of having a simple and effective pump and valves conveniently located for driving and inspection; that of having a distributing head for the oil, which shall be effective and compact; that of having panels inclosing the frame, which shall direct the oil which may be thrown by the crank and cross-head into a reservoir in the base of the engine; and that of having means for removing drops of oil that may adhere to the eccentric, and prevent their being spattered by centrifugal action. And to such ends my invention consists in the oiling system for engines hereinafter specified.

In carrying my invention into practice in the instance chosen for illustration (which shows its application to a vertical engine), the frame of the engine is provided with a reservoir 10 in the base, in which may be put oil for lubricating the engine. Suitable means for draining off the oil may be provided. A strainer 11 is supported in the reservoir as by a forked bracket 12, at such a level as to be below any water of condensation that may accumulate in the reservoir. This strainer is connected by a pipe 12[a] to a union 13, preferably having ground joints, to permit the strainer to be readily removed and cleaned. A pipe 14 extends from the union up to the valve box of the pump. Such box has a vertical cylindrical suction chamber, whose lower end has the pipe 14 secured thereto, and a similar pressure chamber 15, the two chambers being connected by a passage 16, which passage also communicates, by a passage 17, with the interior of the pump cylinder 18. In the suction chamber below the passage 17 is a preferably beveled seat 19 for a ball 20, which ball acts as a valve. The upper end of the suction chamber is closed by a nut 21, having a cylindrical lip or flange extending from its underside down to a level below which the ball cannot pass, the lip being provided with a groove or passage 22 to permit oil to escape. The lip keeps the ball in position and prevents its being carried away by the oil, while at the same time it permits the oil passages to be made large. In the pressure chamber, a seat 23 is formed at a level above the passage 17, and of such shape as to properly hold a ball 24 that also acts as a valve.

The ball 24 is maintained in position by a lip 25 on a nut 26 that closes the pressure chamber, the lip having a groove or hole 27 to permit the passage of oil to a pipe 28, leading to a sight feed 28[a] and thence to distributing head 29, to be later described. The pump chamber is in the present instance bolted to the under side of the steam chest of the engine, and is a simple cylindrical passage in which is mounted the pump piston 30. The piston 30 is preferably a rather loose fit for the cylinder, so that oil may escape from the cylinder and work down the piston for a purpose later to be described. The piston 30 is bolted to an angle plate 32 that is secured to a wrist pin 33, that is clamped to the valve stem 34, the wrist pin having thereon a head 35, on which is secured the eccentric rod 36. The upper nut 37, by which the pump piston is secured to the angle plate is dished on its upper surface, and a cross hole 38 is formed in the plunger connecting with a vertical hole 39, also formed in the plunger, so that oil trickling down the plunger or piston may pass through such holes and drip on to the head 35, the oil passing through a hole 40 formed in the said head, and entering an alining hole 41 in the wrist pin, hole 41 communicating with a horizontal hole 42, which opens into a groove 43 along the surface of the valve stem, oil thus being communicated to the valve stem and being allowed to run down the stem to lubricate the stem in its bearings. The distributing head is preferably an arc-shaped casting, having a chamber or passage formed therein for the oil. This head is made in the form of an arc, because it can thereby surround the stuffing-box on the cylinder head, both to occupy a convenient location and not to be cumbersome. On the under side of the distributing

head are a series of couplings for pipes which convey oil to various parts to be lubricated. Two of these pipes, 40 and 41 respectively, supply oil to the cross-head guides. Oil for the main bearings is supplied by two other of the tubes, 44 and 45, and a fifth tube 46 supplies oil to the cross-head pin, the oil being caught in a cup 47 and entering the pin through an oil passage in its center. A portion of the oil in the cup also escapes through a hole in its bottom into a funnel which is attached to a tube 48 that is secured to the connecting rod, and that leads oil into the crank pin box. The eccentric is oiled through one of the main bearings, the oil reaching the eccentric strap by a groove 48[a] in the eccentric and thence through one or more openings 48[b] diverging from the main shaft. A shield 49 incloses the eccentric, but notwithstanding oil would be spattered under high speeds, especially with horizontal engines, by coming in contact with the eccentric rod, which tends to lead it away from the eccentric. To prevent this a scraper 50 is attached to the eccentric strap in position to nearly touch the eccentric, and to remove any oil from the external periphery of the eccentric. There is also attached at the base of the rod a small shield 51 that intercepts any oil that may remain on the eccentric rod. The openings at the sides of the frame between the guides and the crank shaft bearings are closed by panels 52, each panel having handles 53 that turn clamps 54 on the inside of the panel, the clamps fitting against the legs of the frame. These panels each have ribs 55 and 56, which prevent the oil from dropping down the center, and conduct it toward the outer edges, where it may drop into the reservoir. Without the said ribs, oil thrown from the cross-head, would follow down the inner surface of the panel and escape to the outside of the engine over the main bearing caps. Each panel is also provided with substantially vertical ribs 57 to prevent the oil from passing out through the joint which the panel makes with the frame.

In the operation of my oiling system, the reservoir is supplied with a proper quantity of oil, and the engine being set in motion, the oil will be seen at the sight feed after a few revolutions of the engine. The oil will be supplied under pressure to the distributing head, and pass through the several pipes to the various wearing surfaces. The pressure prevents the oil from becoming clogged, insuring the continuous flow of the oil. It will be observed that every part of the oiling system is accessible, and that the system is simple. The pump is very conveniently driven from the eccentric rod, avoiding complication.

While I have illustrated my system as applied to a vertical engine, it is to be understood that it is applicable to many other forms of engines, and I desire that my claims shall not be limited beyond the requirements of the prior art, and the necessary intendment of the claims.

Claims

1. In an oiling system for engines, the combination of an engine cylinder and piston, a steam chest, a valve in said steam chest, a valve stem for reciprocating said valve, a wrist pin carried by said valve stem, an eccentric rod journaled on said wrist pin, an eccentric and a shaft upon which said eccentric is mounted, an oil pump cylinder parallel to the valve stem, a piston in said oil pump cylinder, and means for connecting said oil piston to said wrist pin.

2. In an oiling system for engines, the combination of a vertically moving eccentric rod a head on such rod, a valve stem, a wrist pin carried by said stem, and upon which the head of said eccentric rod is journaled, an oil pump cylinder above and in line with said eccentric rod, a piston for said cylinder, said piston being sufficiently smaller than said cylinder to permit the escape of oil between such parts, a bracket connecting said piston to said wrist pin, said eccentric rod head having a hole, said hole being located beneath said piston, whereby the oil traveling down said piston may drop into said hole.

3. In an oiling system for engines, the combination of a vertically moving eccentric rod a head on such rod, a valve stem, a wrist pin carried by said stem, and upon which the head of said eccentric rod is journaled, an oil pump cylinder above and in line with said eccentric rod, a piston for said cylinder, said piston being sufficiently smaller than said cylinder to permit the escape of oil between such parts, a bracket connecting said piston to said wrist pin, said eccentric rod head having a hole, said hole being located beneath said piston, whereby the oil traveling down said piston may drop into said hole, said bracket carrying a dish-shaped upper surface to catch the oil running down said piston, and said piston having an internal passage to conduct the oil to the lower end of the piston.

4. In an oiling system for engines, the combination of a cylinder secured to the engine, a piston in said cylinder secured to a moving part of the engine, an oil receptacle, said cylinder and piston forming a pump a valve box for the pump, said box having a suction valve chamber that is connected with said receptacle, said chamber having an entrance at the bottom, a ball adapted to be seated over said entrance, a nut mounted above the ball and having a depending lip or flange that is adapted to surround the ball and hold the ball in place, said lip or flange having a passage formed therethrough, said passage extending into the pump chamber.

5. In an oiling system for engines, the combination of a cylinder secured to the engine, a piston in said cylinder secured to a moving part of the engine, an oil receptacle, said cylinder and piston forming a pump a valve box for the pump, said box having a suction valve chamber that is connected with said receptacle, said chamber having an entrance at the bottom, a ball adapted to be seated over said entrance, a nut mounted above the ball and having a depending lip or flange that is adapted to surround the ball and hold the ball in place, said lip or flange having a passage formed therethrough, said passage extending into the pump chamber, and a discharge valve consisting of a chamber having an entrance connected with the said cylinder, a ball seated over said entrance, a nut above said ball and having a depending lip or flange, said last-mentioned lip or flange and the valve chamber having an exit formed therethrough.

6. In an oiling system for engines, the combination of an engine cylinder, a piston, a piston rod, and a stuffing-box through which said rod passes, a crank shaft, bearings therefor, and valve mechanism a source of supply of oil under pressure, a distributing head surrounding the stuffing box of the cylinder, and pipes leading from said head to the parts to be oiled.

7. In an oiling system for vertical engines, the combination of an engine cylinder, a piston, a piston rod, and a stuffing-box through which said rod passes, a crank shaft, bearings therefor, and valve mechanism an oil pump, a substantially arc-shaped distributing head surrounding the stuffing box, and pipes leading from said head to the parts to be oiled.

8. In an oiling system for vertical engines, the combination of an engine cylinder, a piston, a piston rod, and a stuffing-box through which said rod passes, a crank shaft, bearings therefor, and valve mechanism an oil pump, a distributing head consisting of a substantially arc-shaped tube surrounding the stuffing box of the engine, a connection between said pump and said head and pipes connecting said distributing head with the parts to be oiled.

9. In an oiling system for vertical engines, the combination of an engine cylinder, a piston, a piston rod, and a stuffing-box through which said rod passes, a crank shaft, bearings therefor, and valve mechanism an oil pump, a distributing head consisting of a substantially arc-shaped tube surrounding the stuffing box, a connection between the pump and said head, a sight feed interposed in said connection, and pipes extending from said distributing head to the parts to be oiled.

10. In an oiling system for vertical engines, the combination of a vertically moving valve stem, a wrist pin carried by said valve stem, an eccentric rod whose head is journaled on said wrist pin, an oil pump cylinder above and in line with said rod, a piston occupying said cylinder and connected with said wrist pin, said piston being smaller than the cylinder to permit oil to escape along said piston, said wrist pin having an internal oil passage, said parts being provided with passages for conducting the escaping oil to said internal passage, and a groove for conducting oil from said internal passage to the valve stem, whereby the bearings of said stem may be lubricated.

11. In an oiling system for vertical engines, the combination of an **A**-shaped frame, cylinder and cross-head guides at the upper portion of said frame, said frame having the crank shaft bearings below, removable panels adapted to close the lower openings of said frame, means for oiling the cross-head guides, and ribs on said panels adapted to catch the oil and prevent its running down on the crank shaft bearings.

12. In an oiling system for vertical engines, the combination of an **A**-shaped frame, cylinder and cross-head guides at the upper portion of said frame, said frame having the crank shaft bearings below, removable panels adapted to close the lower openings of said frame, means for oiling the cross-head guides, ribs on said panels adapted to catch the oil and prevent its running down on the crank shaft bearings, said ribs consisting of ledges inclined downward from a point above said bearings to a point beyond them in a lateral direction.

13. In an oiling system for vertical engines, the combination of an **A**-shaped frame, a cylinder and cross-head guides at the upper portion of said frame, said frame having the crank shaft bearings below, removable panels adapted to close the lower openings of said frame, means for oiling the cross-head guides, ribs on said panels adapted to catch the oil and prevent its running down on the crank shaft bearings, said ribs consisting of ledges inclined downward from a point above said bearings to a point beyond them in a lateral direction, and ribs or edges adapted to catch the oil from said first-mentioned ribs and cause it to drop at the side of the bearings.

14. In an oiling system for vertical engines, the combination of an **A**-shaped frame, cylinder and cross-head guides at the upper portion of said frame, said frame having the crank shaft bearings below, removable panels adapted to close the lower openings of said frame, means for oiling the cross-head guides, ribs on said panels adapted to catch the oil and prevent its running down on the crank shaft bearings, and substantially vertical ribs on said panels to cover the joints between said panels and the legs of the **A**-frame.

15. In an oiling system for engines, the combination of means for oiling the eccentric, and a finger carried by the eccentric strap,

and standing near enough to the flange of the eccentric to detach oil that may drop thereon.

16. In an oiling system for engines, the combination of means for oiling the eccentric, and a shield carried by the eccentric rod at the base of the eccentric strap to prevent oil from traveling along the eccentric rod.

In testimony that I claim the foregoing I have hereunto set my hand.

MERRITT W. SMITH.

Witnesses:
J. W. STONE,
C. H. GERNEST.