April 29, 1941. C. H. LOUREE 2,239,853

STEEL RECIPROCATING PUMP

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Fig. 1.

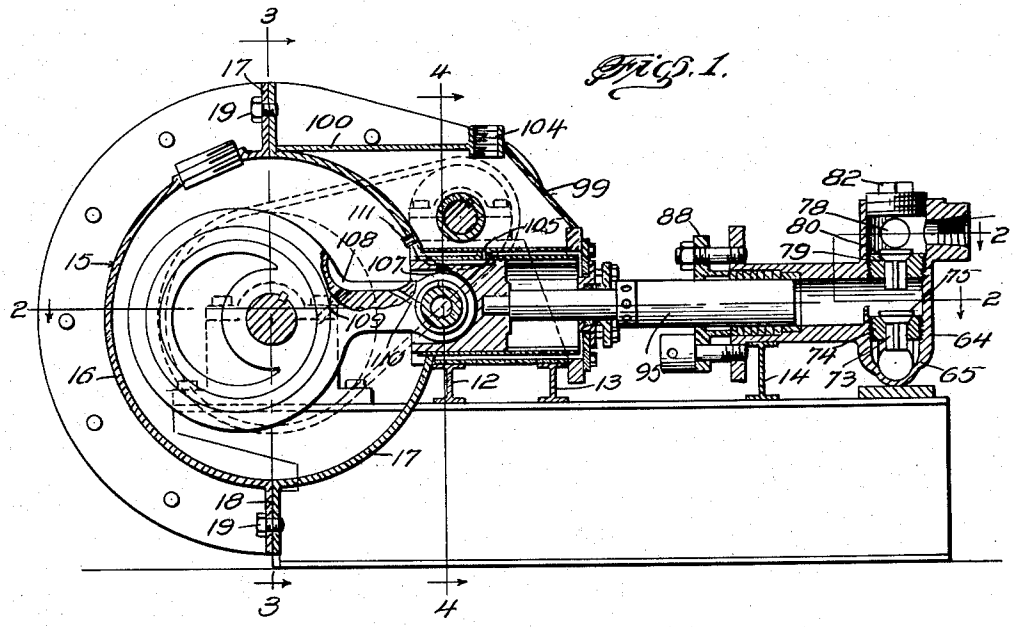
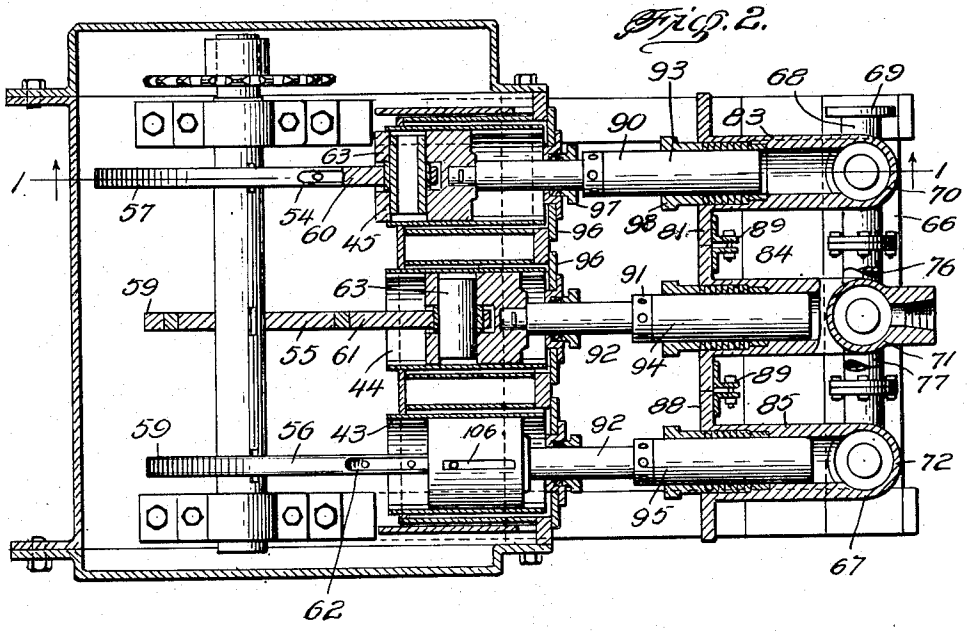



Fig. 2.




Charles H. Louree. INVENTOR

BY Victor J. Evans & Co.

ATTORNEYS

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Fig. 3.

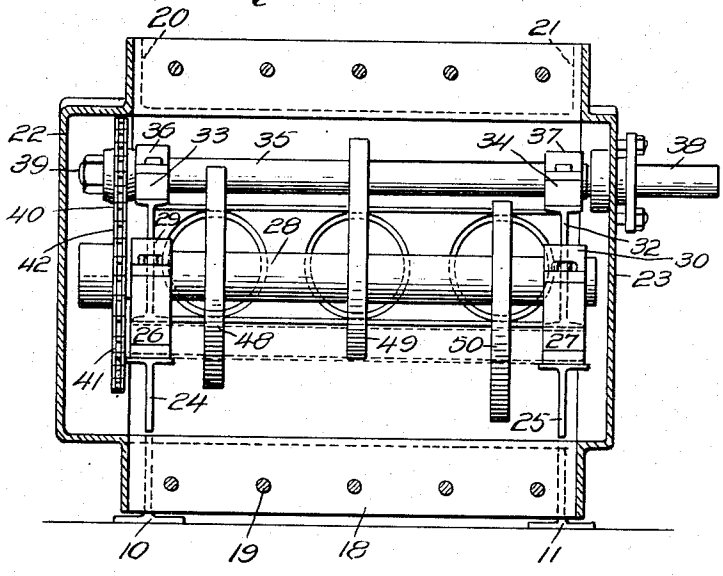
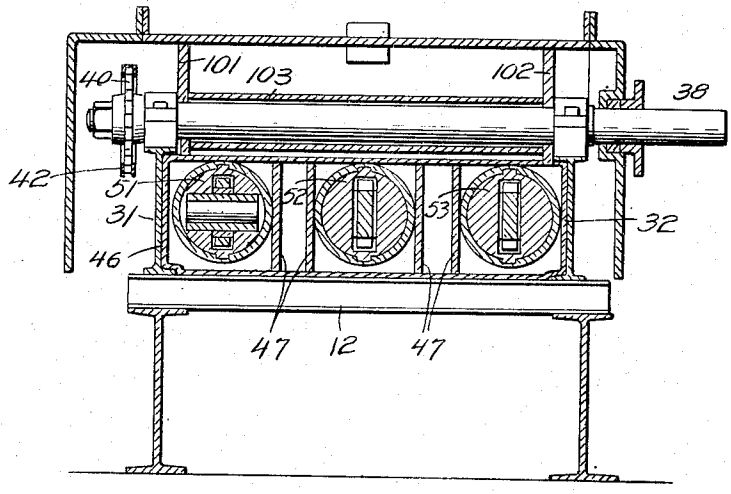



Fig. 4.

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Patented Apr. 29, 1941

2,239,853

# UNITED STATES PATENT OFFICE

2,239,853

## STEEL RECIPROCATING PUMP

Charles Harold Louree, Tulsa, Okla.

Application June 14, 1939, Serial No. 279,185

1 Claim. (Cl. 103—202)

My invention relates to fluid pumps.

An important object of my invention is to provide a fluid pump that is light in construction and of sufficient durability to permit the same to efficiently and efficaciously perform its duties.

Another object of my invention is the provision of a fluid pump that is compact in its construction to afford an efficient operating pressure.

Still another object of my invention is to provide a fluid pump that is adapted to maintain a substantially constant pumping pressure at all times.

Yet another object of my invention is to provide a fluid pump that may be fabricated entirely of metal tubes and plates thereby eliminating the usual heavy castings and obtaining a fluid pump that is light in weight but that has in no way sacrificed strength or durability in its construction.

Other objects and advantages of my invention will be apparent during the course of the following description.

In the drawings, forming a part of this specification, and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a longitudinal sectional view of a device embodying my invention,

Figure 2 is a transverse sectional view, taken on the line 2—2 of Figure 1,

Figure 3 is a vertical sectional view, taken on the line 3—3 of Figure 1, and

Figure 4 is a vertical sectional view, taken on the line 4—4 of Figure 1.

In the accompanying drawings, wherein for the purpose of illustration, is shown a preferred embodiment of my invention, the numerals 10 and 11 designate longitudinally disposed parallel supporting members, here illustrated as I-beams, and being provided with spaced transversely positioned supporting I-beams 12, 13 and 14.

The numeral 15 designates a crankcase comprising arcuately formed plates 16 and 17 having the longitudinal edges thereof bent outwardly at right angles thereto to form the center flanges 17 and 18 which are maintained in appressed relation by the threaded bolts 19. The ends of the plates 16 and 17 are formed with radial flanges 20 and 21 which receive the cupular end plates 22 and 23.

The supporting I-beams 10 and 11 are formed with longitudinal extending rib portions 24 and 25 which project into the casing 15 and support the pillow blocks 26 and 27 respectively. The space between the crankcase 15 and the ribs 24 and 25 may be filled in with a welding material, or the like, in a manner whereby a fluid tight union will be formed therewith. The crankshaft 28 is mounted for rotation on the pillow blocks 26 and 27 and the heads 29 and 30 are bolted, or otherwise secured, to the pillow blocks to hold the said crankshaft against displacement. The I-beam supports 31 and 32 are spaced above the I-beams 10 and 11 and supported by the transverse I-beams 12 and 13 forwardly of the crankcase 15. The pillow blocks 33 and 34 rest upon the I-beams 31 and 32 and rotatably receive the countershaft 35 which is held thereon against displacement therefrom by the heads 36 and 37. The end 38 of the countershaft projects exteriorly of the cover 23 where it may be connected to any suitable source of power, and the inner end 39 of the said shaft carries the sprocket 40 which is connected to a sprocket 41 on the crankshaft 28 by an endless chain 42.

The plate 17 is formed at its middle with spaced laterally extending tubular cylinders 43, 44 and 45, a substantially rectangular casing 46 encompasses the cylinders, as illustrated in Figure 4, and the vertical supporting walls 47 are disposed in tangential relation to the cylinders to support the same and to impart a substantial rigidity to the entire structure. The cylinders, casing and walls are formed from conventional structural tubing and plates maintained in proper association by means of welding, or the like. The eccentrics 48, 49 and 50 are keyed for rotation to the crankshaft 28 and are positioned in aligning relation to the cylinders 43, 44 and 45. The cross heads 51, 52 and 53 are reciprocally mounted in the cylinders 45, 44 and 43 and are connected to the eccentrics 48, 49 and 50 by the connecting rods 54, 55, and 56. The connecting rods are formed with ring portions 57, 58 and 59 which encompass the eccentrics and with laterally extending arms 60, 61 and 62, the extremities of which are pivotally attached to the cross heads by the wrist pins 63.

The fluid pump 64 is constructed from a plurality of seamless tubes welded, or otherwise secured together in the manner hereinafter set forth. The transversely positioned inlet tube 65 is supported on the bar 66 which is welded or otherwise secured to the supporting I-beams 10 and 11. The end 67 of the tube 65 is closed and the end 68 thereof is provided with a radial flange 69 for connection to a pump line (not shown). The vertically disposed tubes 70, 71 and 72 are welded to the inlet tube 65 and communicate therewith through the passages 73 in the valve seats 74 which are threaded into the lower ends

of the pipes 70, 71 and 72 and support the valves 75. The seats 74 have been made removable so that they may be easily replaced when they become worn or pitted. The upper ends of the tubes 70, 71 and 72 are connected by transversely positioned tubular members 76 and 77 which communicate with the upper ends of the said tubes through the ports 78. The removable valve seats 79 are threadedly received by the vertical tubes 70, 71 and 72 subjacent to the ports 76, and the valves 80 are seated thereon to control the flow of the fluid into the discharge opening 81 in the upper portion of the middle tube 71. The upper extremities of the tubes 70, 71 and 72 above the ports 76 are closed by threaded plugs 82 which are removable to permit ready access to be had within the tubes. The laterally extending tubular cylinders 83, 84, and 85 are welded to the vertical tubes 70, 71 and 72 respectively, and communicative therewith intermediate of the valve seats 74 and 79 and the outer ends thereof receive supporting plates 86, 87 and 88 which are held in abutting relation by angle clips 89. The transverse tubular cylinders 83, 84 and 85 are supported in longitudinal alignment with the crankcase cylinders 43, 44 and 45 by the transverse I-beams 14.

The fluid pump, hereinabove described, may be fabricated from tubing welded together to form a light, compact structure.

The pistons 90, 91 and 92 are secured to and actuated by the crossheads 51, 52 and 53 and the free ends 93, 94 and 95 thereof are reciprocally received in the lateral pump cylinders 83, 84 and 85. The outer ends of the crankcase cylinders are enclosed by front plates 96 which carry packing glands 97 to prevent fluid within the cylinders from escaping therefrom, and the plates 86, 87 and 88, carried by the pump cylinders 83, 84 and 85, are provided with packing glands 98 which provide a fluid tight engagement between the pistons and the said cylinders.

The oil pan 99 is disposed above the crankcase cylinders 43, 44 and 45 and the top surface of the casing 46 constitutes the bottom of the oil pan; the plate 100 constitutes the top portion thereof, and the vertical side walls 101 and 102 receive the countershaft 35 innerjacent the pillow blocks 33 and 34. The plates 100, 101 and 102 are welded to the casing 46 to define a fluid tight receptacle. A tubular member 103 encloses the portion of the countershaft intermediate of the end walls 101 and 102 and has its either end thereof welded, or otherwise secured, to the inner face of the walls. The top portion 100 of the oil pan is provided with a filler tube 104 by which a suitable lubricating fluid may be introduced therein. The bottom of the oil pan is provided with discharge ports 105 which communicate with longitudinal grooves 106 in the crossheads 51, 52 and 53 to lubricate the same, and the inner ends of the grooves 106 communicating with the wrist pin connections through the lubricating ports 107. The arms 60, 61 and 62 of the connecting rods are provided with longitudinal grooves 108 either end of which terminates in oblique lubricating bores 109 and 110 which communicate with the peripheries of the eccentrics and the wrist pin connections respectively. The lubricating tubes 111 extend through the crankcase housing and into the oil pan and are positioned above the grooves 108 in the connecting rods so that the fluid within the oil pan may fall within the longitudinal groove 108 and flow into the lubricating bores 109 and 110.

The operation of my device is as follows:

When rotation is imparted to the countershaft 35 the crankshaft 28 will be rotated through the endless chain 42 and as the eccentrics 48, 49 and 50 revolve, the connecting rods 54, 55 and 56 will cause the crossheads 51, 52 and 53 to reciprocate within the cylinders 43, 44 and 45. The reciprocatory motion of the crossheads will in turn be transmitted to the pistons 90, 91 and 92 to create a suction within the transverse pump cylinders 83, 84 and 85, and to draw the fluid from the inlet tube 65 thereof into the pump chambers intermediate of the valve seats 73 and 79. As the pistons 90, 91 and 92 move forwardly in the pump cylinders, the fluid therein will be discharged through the outlet port 81. It will be noted that the eccentrics are arranged on the crankshaft so that constant pumping action will be maintained at all times, and it will be seen that the entire device is formed of metal plates and tubes bolted and welded together in a compact structure that is at once light in weight and durable in construction.

It is to be understood that the form of my invention, herewith shown and described, is to be taken as a preferred embodiment of the same, and that various changes in the size, shape and arrangement of parts may be resorted to without departing from the spirit of my invention, or the scope of the appended claim.

Having thus described my invention, I claim:

In a pump construction; a tubular crankcase; laterally extending, horizontally aligned tubular cylinders welded to and communicating with the crankcase, a rectangular sheet metal frame encompassing the said cylinders and with the rearward edge thereof contacting the crankcase, a plate extending laterally from the crankcase in superimposed relation to the cylinders, the forward margin of the plate curving downwardly to abuttingly engage the forward edge of the said frame and with the end margins thereof bent downwardly to engage the crankcase and frame to define a fluid tight enclosure, which enclosure communicates with each of the cylinders through spaced ports extending through the frame and cylinder walls and with the crankcase through ports extending through the crankcase wall, said plates and tubular members being fabricated from structural shapes welded together to define a light, compact and durable structure.

CHARLES HAROLD LOUREE.