F. N. LIVINGSTON.

PUMP.

APPLICATION FILED MAR. 12, 1914.

1,133,980. Patented Mar. 30, 1915.

FIG. 1.

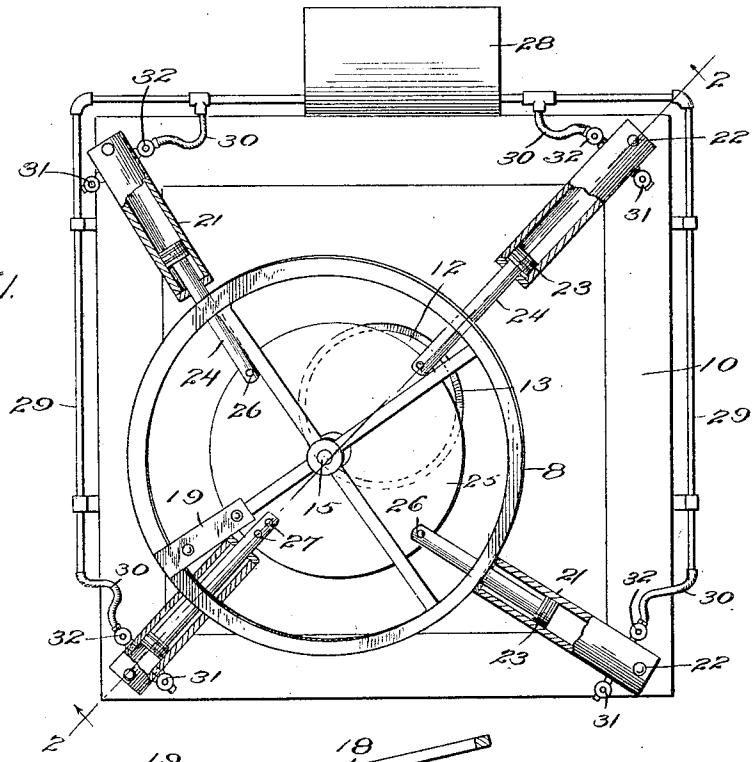
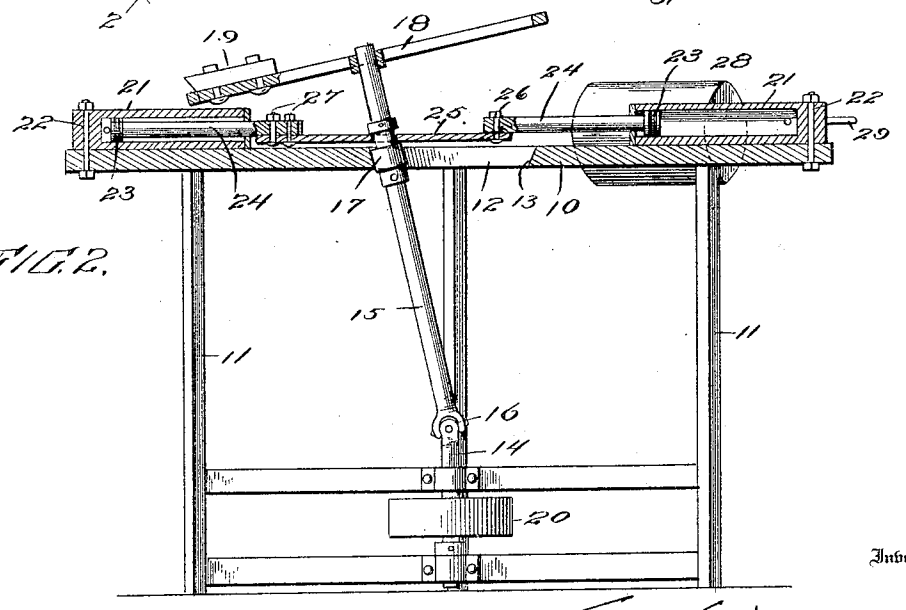


FIG. 2.



Witnesses

R. S. Hogner.

L. B. Morrill

Inventor

Fred N. Livingston,

By Mason Fenwick & Lawrence,

Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRED N. LIVINGSTON, OF SEATTLE, WASHINGTON.

PUMP.

1,133,980. Specification of Letters Patent. Patented Mar. 30, 1915.

Application filed March 12, 1914. Serial No. 824,235.

To all whom it may concern:

Be it known that I, FRED N. LIVINGSTON, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to pumps and has for an object to employ centrifugal force for operating cylinder and piston pumps.

A further object of the invention is to provide a non-rotatable disk which is given a gyratory movement by a rotating overbalanced wheel or member.

With these and other objects in view the invention comprises certain novel constructions, combinations and arrangement of parts as will be hereinafter more fully described and claimed.

In the drawings: Figure 1 is a view of the pumping apparatus in top plan, parts being broken away to show the internal construction. Fig. 2 is a view of the device in section as indicated by line 2—2 of Fig. 1.

Like characters of reference designate corresponding parts throughout the several views.

The improved pumping apparatus which forms the subject matter of this application comprises a table 10 supported in any approved manner as upon the legs 11, it being understood that the supporting apparatus forms no part of the present invention.

Centrally through the table 10 an opening 12 is produced preferably having inclined edges as indicated at 13. Also centrally beneath the table a shaft 14 is journaled with a shaft 15 connected therewith by a universal joint shown conventionally at 16. The shaft 15 is also provided with a roller 17 which rolls upon the inclined edge of the opening 12.

Upon the upper end of the shaft 15 which extends above the table 10 a wheel 18 is mounted having at one side a weight 19 which causes the shaft 15 to tilt to one side into engagement with the edge of the opening 12.

It will be obvious that when the shaft 14 is rotated in any approved manner as by power applied to the pulley 20 the weight 19 will by centrifugal action tend to move the wheel 18 and the shaft 15 in the direction of the weight itself.

Mounted upon the table 10 are a plurality of cylinders 21 shown in the drawing as four in number but it is to be understood that the number of such cylinders is wholly immaterial to the present invention. The cylinders are pivoted upon the table as indicated at 22 so that they are free to oscillate in a horizontal plane. Within the cylinders 21 pistons 23 are mounted to reciprocate controlled by piston rods 24. The piston rods 24 are connected with a disk 25 freely embracing the shaft 15 and movable thereby in a gyratory circuit under the impulse of the weight 19. All but one of the piston rods 24 are pivoted to the disk as indicated at 26 but one is rigidly secured as indicated at 27 so that the disk is held against rotation thereby.

It is obvious, therefore, that as the shaft 14 is rotated through the medium of the centrifugal apparatus as described the disk 25 will be given a gyratory movement which will cause the reciprocation of the pistons 23 within the cylinders 21, the cylinders themselves responding by oscillating to such gyratory movement.

The reciprocation of the pistons within the cylinders may be employed for any usual ordinary or desired purpose. As shown in the drawing a receptacle 28 is in communication with such cylinders by means of pipe 29 which communicates with the several cylinders by means of flexible couplings 30. The flexible couplings are provided to permit oscillation of the cylinders. As shown at Fig. 1 the device would probably be employed as an air compressor and check valves 31 for inlet and 32 for outlet are provided. It will be obvious that when the pistons reciprocate within their cylinders as above described air will be drawn inwardly successively through the several check valves 31 upon the outstroke of the piston and will be compressed within the cylinders and forced through the check valves 32, flexible couplings 30 and pipe 29 into the receptacle 28 upon the instroke of the piston.

The greatest object of constructing the device is for economy of power which is especially noticeable in the matter of starting. When power is first applied to the pulley 20 it is obvious that the wheel 18 will rotate without any gyratory movement until

the speed of the drive becomes such that the weight exerts a sufficient centrifugal force to overcome the resistance of the cylinders and pistons whereupon the gyratory movement of the parts begins and continues as long as the drive keeps the speed up to the required momentum.

I claim:

1. In a pumping apparatus, a table; a plurality of cylinder and piston pumps mounted upon the table; a shaft extending through the table; a weight carried at one side of the shaft tending to tilt the shaft against the table; a disk carried by the shaft and pump pistons connected with the disk adapted to permit gyratory movement of the disk.

2. In a pumping apparatus, a table having an opening therethrough; a plurality of cylinders and piston pumps surrounding the opening; a shaft extending upwardly through the opening in the table; a weight carried by the shaft tending to tilt the shaft into engagement with the opening; a disk embracing the shaft and adapted to receive gyratory movement therefrom; and connection between the disk and the pump pistons.

3. In a pumping apparatus, a journaled shaft; a shaft connected with the journaled shaft by a universal joint; a table surrounding the last mentioned shaft; a weight carried at one side of the last mentioned shaft adapted to tilt the same into engagement with the table; a disk mounted to gyrate above the table and embracing the tiltable shaft; and pump members connected with the disk.

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

FRED N. LIVINGSTON.

Witnesses:
G. WARD KEMP,
ED M. BAYLISS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."