Oct. 30, 1923.

F. D. HOFFMAN ET AL

1,472,362

KINETIC POWER JACK

Filed March 11, 1922

3 Sheets-Sheet 1

Fig. 1.

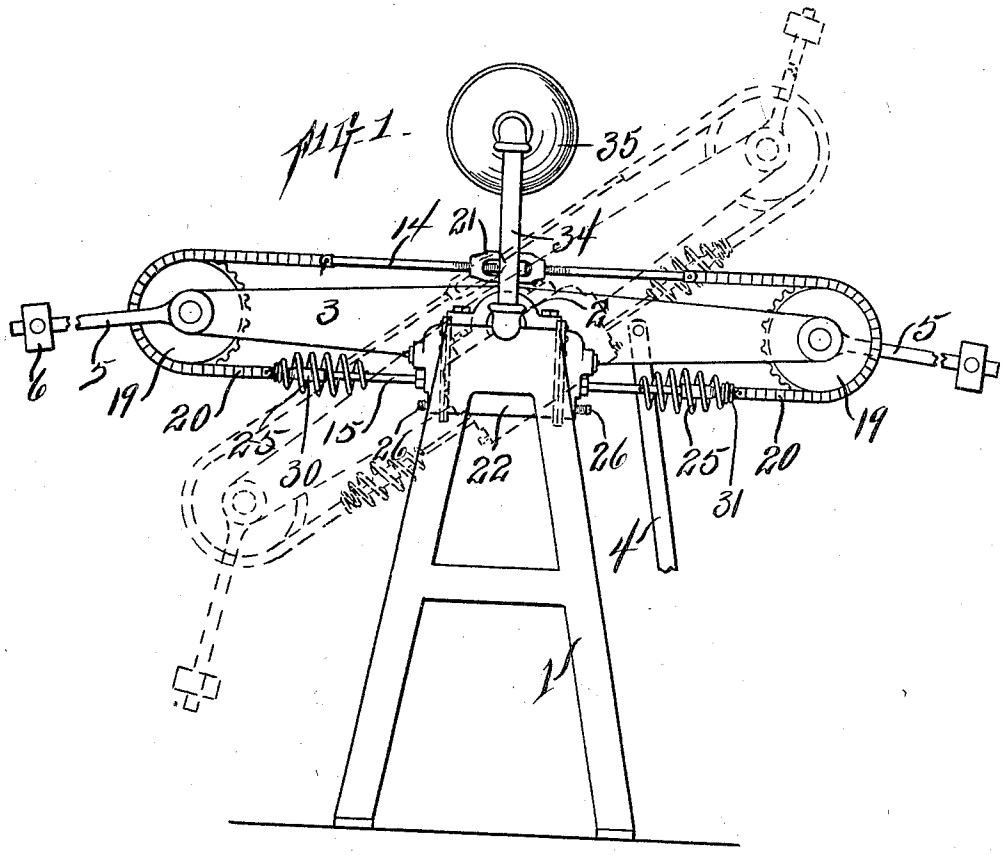

Fig. 2.

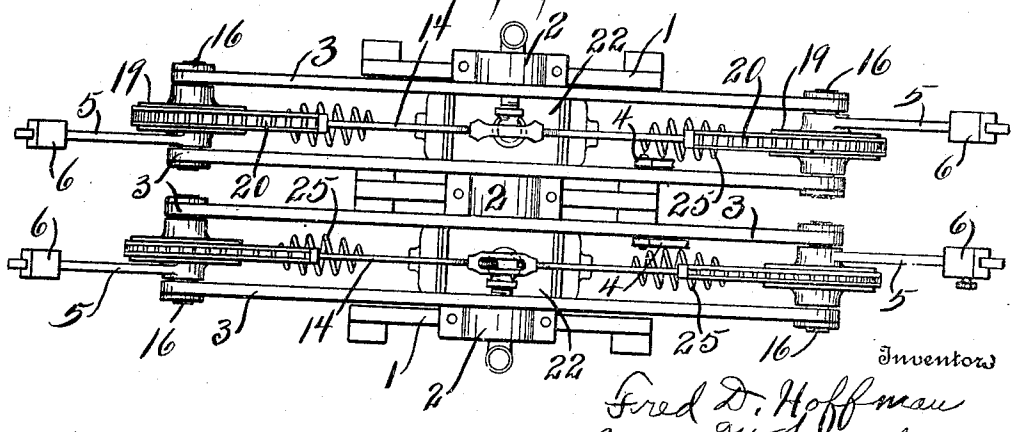

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Fig. 7

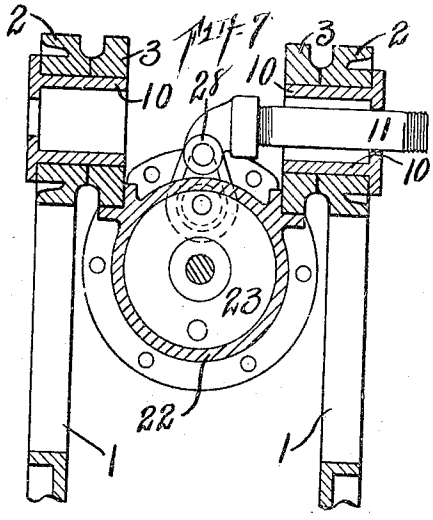


Fig. 8

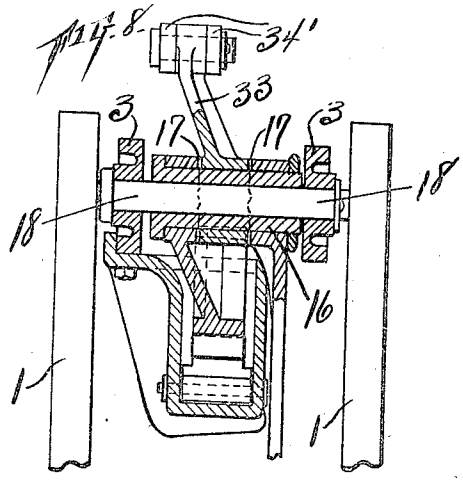


Fig. 5

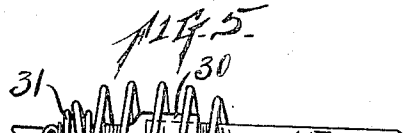


Fig. 3

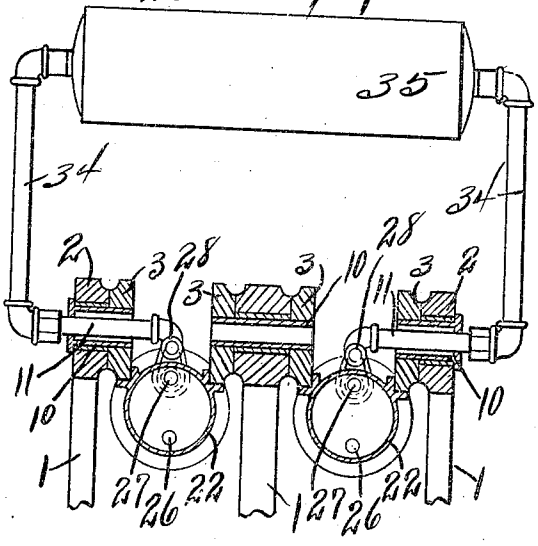
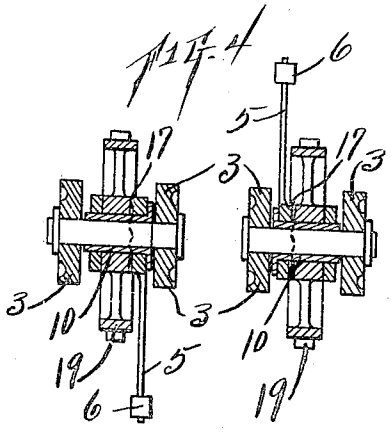


Fig. 4



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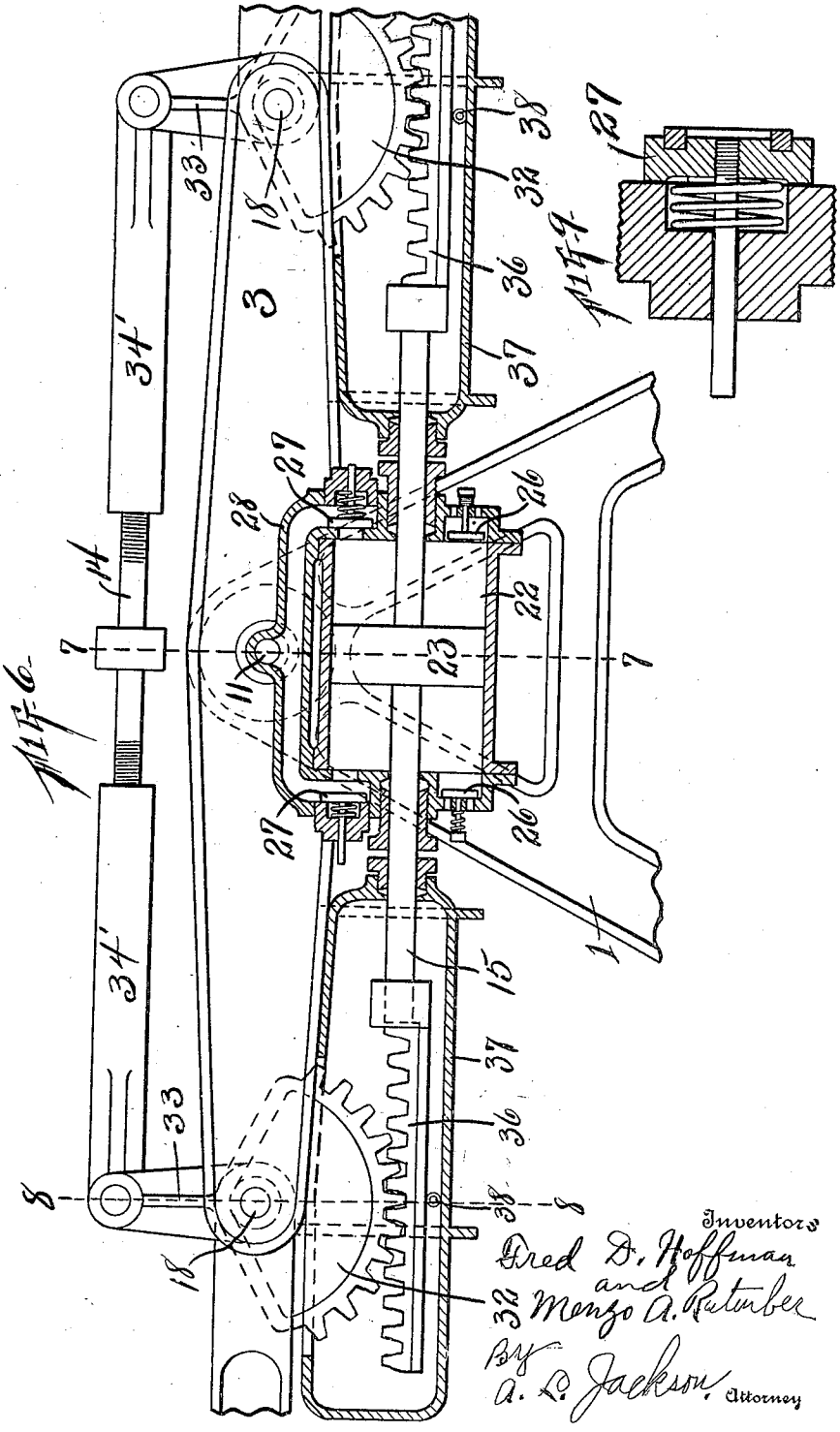

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UNITED STATES PATENT OFFICE.

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KINETIC POWER JACK.

Application filed March 11, 1922. Serial No. 543,097.

To all whom it may concern:

Be it known that we, FRED. D. HOFFMAN and MENZO A. RUTENBER, citizens of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Kinetic Power Jacks, of which the following is a specification.

Our invention relates to improvements in kinetic power jacks; and one object is to provide a walking beam structure having combined therewith oscillating weighted pendulums and an air compressor cooperating with said walking beam and pendulums, the momentum of which is utilized to operate more efficiently reciprocating mechanism such as pumps, well drilling machines, and the like, somewhat in the same manner as the efficiency of any drive mechanism is increased by the use of a fly-wheel.

A further object is to utilize weighted pendulums by connecting their movements directly with the reciprocating mechanism whereby a considerable saving in the operating power is attained.

This invention further relates particularly to power jacks, such as shown in Fred. D. Hoffman's Patent No. 1,414,876, May 2, 1922, by making the mechanism shown and described therein more effective in performing functions under different conditions instead of building a new apparatus for each condition.

Other objects and advantages will be fully explained in the following description and the invention will be more particularly pointed out in the claims.

Fig. 1 is a side elevation of the power jack, showing in dotted outline the walking beam in an extreme position of oscillation. Fig. 2 is a plan view of the same. Fig. 3 is a vertical cross-section of the same except the air-storage tank. Fig. 4 is a vertical section of the walking beams and their bearings, also showing the relative positions of the pendulums in extreme oscillation of the walking beams. Fig. 5 is a detail view of the connection of the piston rod. Fig. 6 is a broken vertical section, showing a variation in the power transmitting connections. Fig. 7 is a vertical section, taken on the line 7—7 of Fig. 6. Fig. 8 is a vertical section, taken on the line 8—8 of Fig. 6. Fig. 9 is an enlarged sectional view of one of the adjustable spring outlet valves.

Similar characters of reference are used to indicate the same parts throughout the several views.

The kinetic power machine is provided with frames, each consisting of a pair upright angular members 1 and bearings 2 are provided at the upper ends of the frame members 1. Inner sleeve bearings 10 are mounted in the bearings 2 for fulcrums for walking beams 3. There may be any suitable number of walking beams 3. Each walking beam 3 may be provided with a pitman rod 4 which may be driven by any suitable power. The pitman rod 4 is pivotally connected to the walking beam and to a suitable mechanism which will move or vibrate the walking beam at a predetermined number of times per minute.

Pendulums 5 are pivotally connected to the ends of the walking beams 3 and each pendulum is provided with a weight 6 which is adjustable thereon. The pendulums 5 are operatively connected to power transmitting connecting rods 14 and 15 by means of hollow bolts 16 and corrugated bearing faces 17. The pendulums 5 have bearings which engage the hollow shafts 16 and the shafts 16 oscillate on journals or pins 18. Disks or sprocket wheels 19 also engage the hollow bolts or shafts 16 by means of bearing hubs. The faces of the bearings or the hubs of wheels 19 are corrugated and the faces of the bearings of the pendulums 5 are corrugated and mesh with the hubs of wheels 19. By such construction and arrangement the pendulums and the wheels 19 must move simultaneously or synchronously. Sprocket chains 20 connect with the rods 14 and 15 and run on the wheels 19. The rods 14 are intercepted and the parts are connected by turn-buckles 21 for adjusting purposes. The rods 15 serve also as a piston rod for a pump cylinder 22 which is provided with a piston 23. The rods 15 may be connected to the chains 20 by means of sockets 30 which receive the ends of the rods 15 loosely. The other ends of the sockets 30 are reduced and threaded and collars 31 are screwed on the threaded shanks of the sockets. The shanks of the socket are then connected to the sprocket chains. Springs 25 are coiled about the sockets 30 and engage the collars 31 and are attached to the ends of the rods 15. The object of this construction and arrangement of parts is to contract the reaction from the swinging pendulums 5.

A variation in the connection of the pendulums 5 with the rods 14 and 15 is shown in Figs. 6, 7, and 8. Segmental cog wheels 32 are journaled on the shafts or pins 18. Cranks 33 project from the cog wheels 32 and the cranks 33 are pivotally connected to sockets 34 which are threaded at their inner ends to receive the threaded ends of the rods 14 which are right and left threaded Each rod 14 is provided with a wrench connection 7 so that the rod can be turned for adjusting purposes.

In either form of connection of the pendulums 5 and the rods 14, the pendulums 5 may be set at whatever angle to the rods that may be required by reason of the adjustments set forth by the corrugated faces of the hubs and the bearings of the pendulums.

The cylinders 22 have automatic air inlet valves 26 and adjustable outlet valves 27 and the valves 27 lead into a common air pipe 28, which turns upwardly into the hollow fulcrum shaft 11. Pipes 34 are connected to the shafts 11 and are provided with the necessary check valves and then connected to a pressure tank 35 or as many tanks as may be necessary for commercial use.

When the walking beams 3 are oscillated by the application of power thereto by the reciprocating rods 4, the piston 23 will remain stationary until the pendulums 5 begin to swing and their relative movements are transmitted through the adjustable connecting rods 14 and 15 to the piston 23 in cylinder 22 whereby air or liquids may be pumped into the pipe 28 for transmission to the tank or tanks 35 for commercial use. Every reversal of the walking beams 3 impels the two pendulums 5 to alternately high and low positions with the result that the reciprocating motion or movements will be imparted to the piston 23, and by co-ordinating the adjustment of pressure in the springs 25 with the adjustable lengths of the connecting rods 14 and the springs of the adjustable outlet valves 27, the kinetic value of the oscillating pendulums is transferred into the reciprocating motion of the pump piston 23 with a hitherto unknown efficiency. It is clear that by the proper adjustment of the springs of the air outlet valves 27, the necessary air cushion may be selected to control the excessive swinging of the pendulums. The connection of the segmental cog wheels 32 with the connecting rods 15 is effected by racks 36. The racks 36 are inclosed in a housing 37 and anti-friction rollers or idlers support the racks in operative position with the cog wheels 32.

What we claim is,—

1. A kinetic power jack comprising a walking beam and means for oscillating the same, pendulums pivotally hung from the ends of said walking beam, and connecting rods and gearing operatively connecting said connecting rods to said pendulums to be actuated by said pendulums, one of said connecting rods serving as a piston rod.

2. A kinetic power jack comprising pendulums, means for actuating said pendulums, and connecting rods and gearing operatively connecting said rods to said pendulums, one of said rods serving as a piston rod.

3. A kinetic power jack comprising a walking beam, pendulums pivotally connected and actuated by said walking beams, gear wheels connected laterally with said pendulums, and adjustable connecting rods operatively connected to said gear wheels, one of said rods serving as a piston rod.

In testimony whereof, we set our hands, this first day of March, 1922.

FRED. D. HOFFMAN.
MENZO A. RUTENBER.