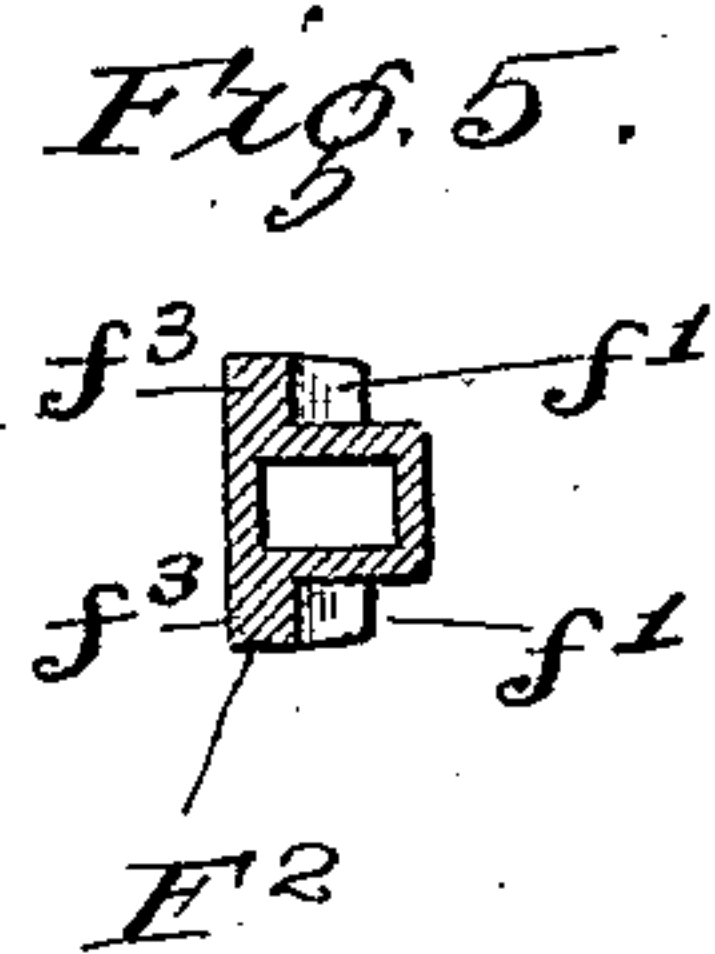
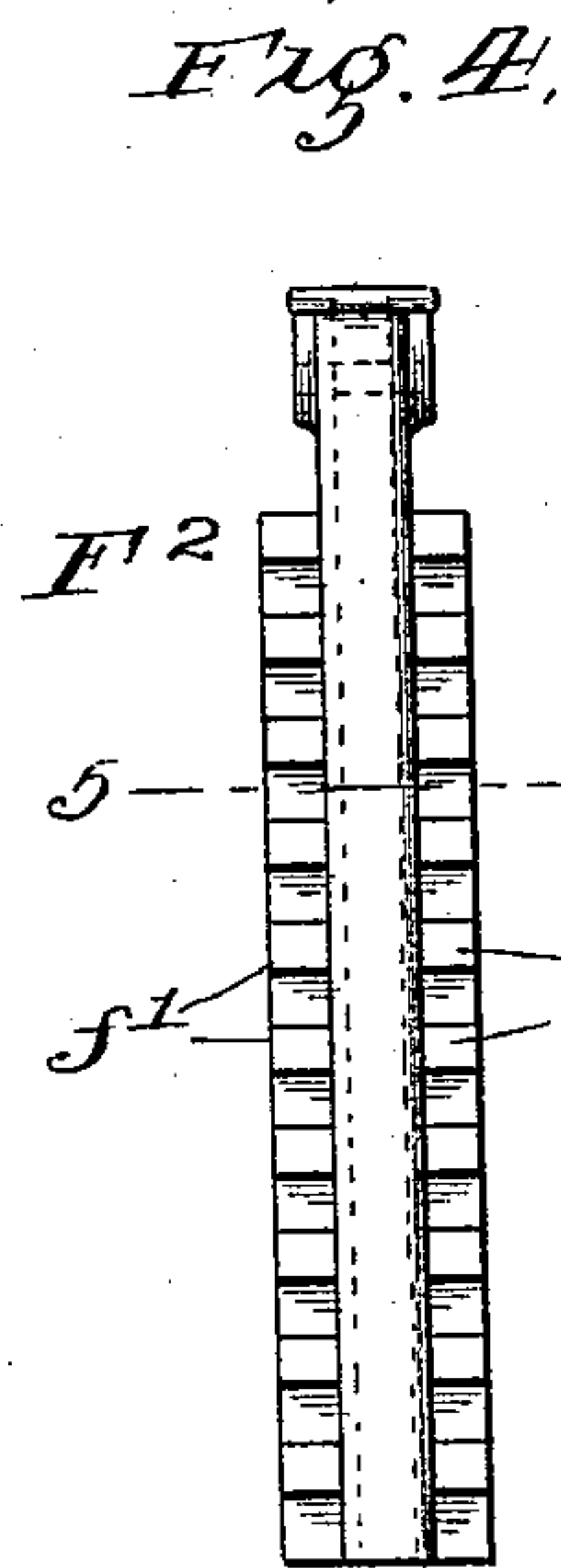
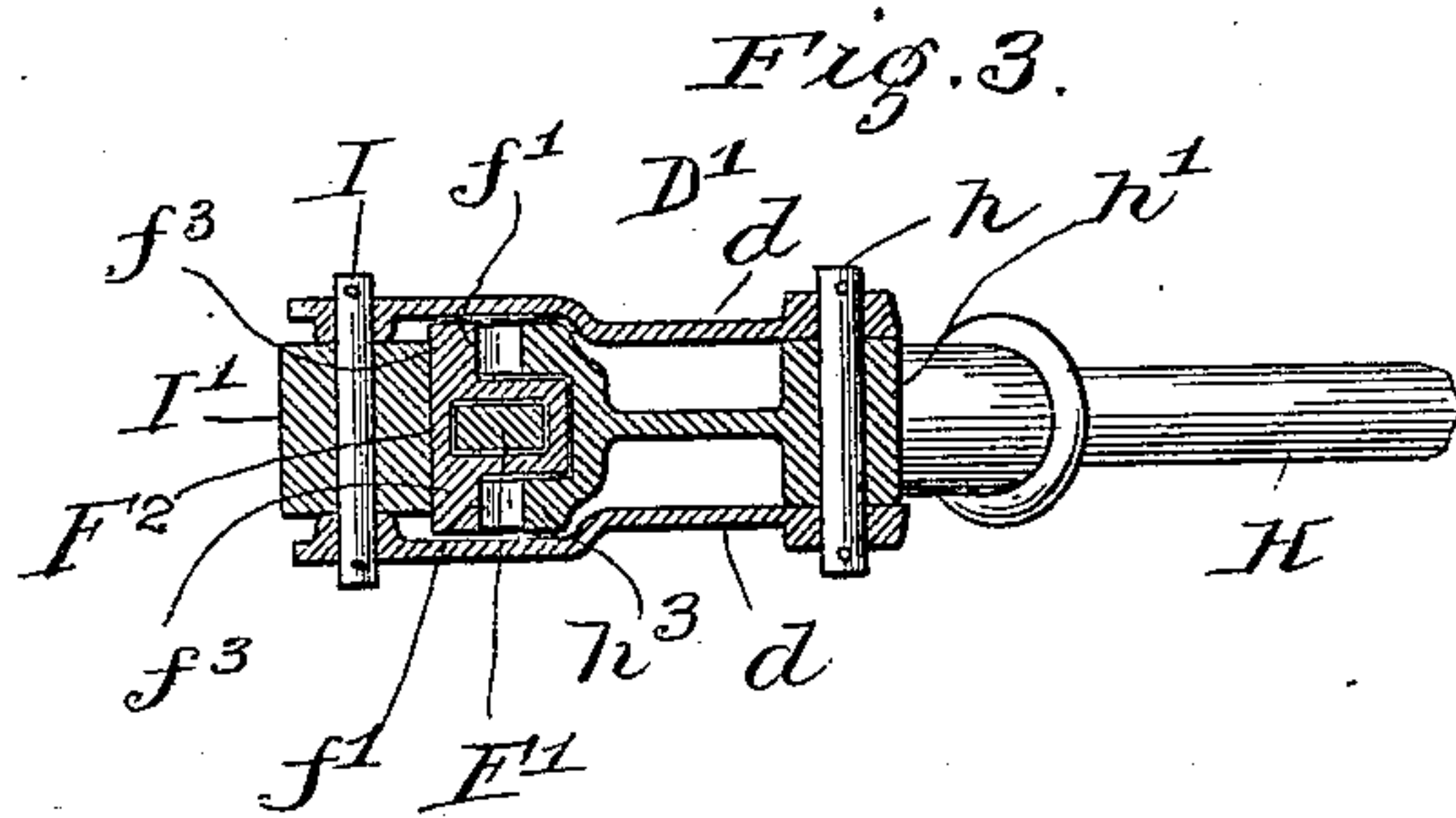
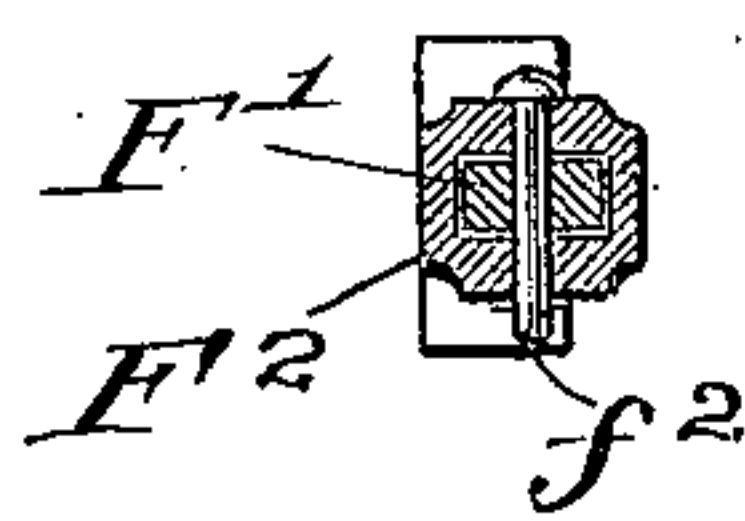
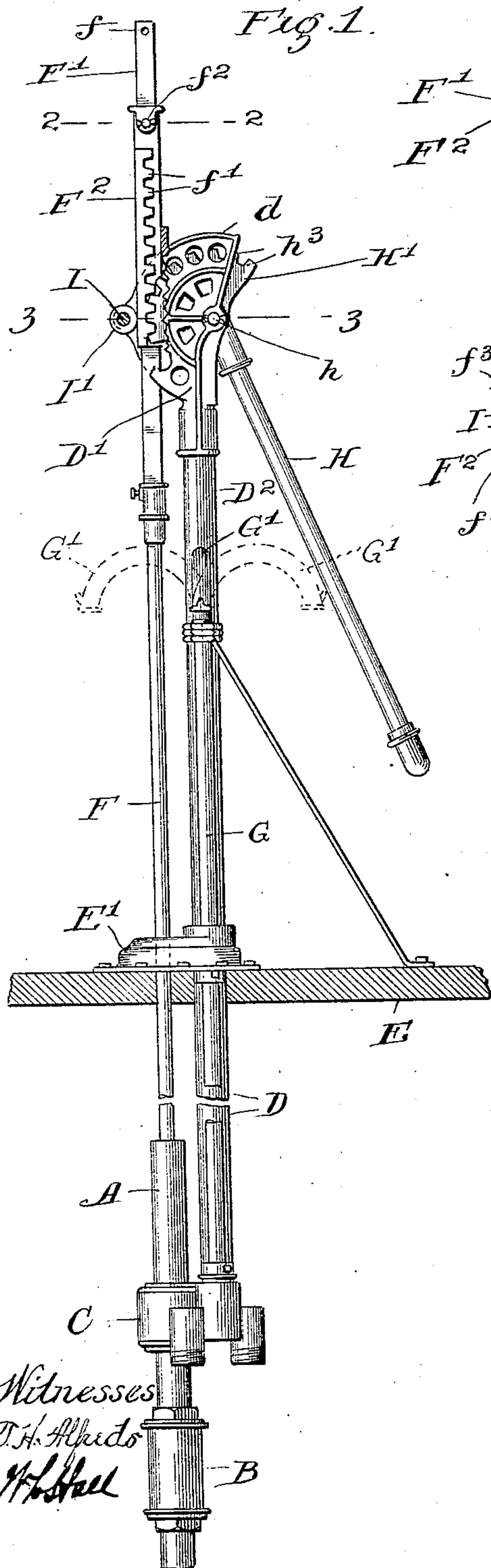


No. 855,783.

PATENTED JUNE 4, 1907.

W. F. JACOBS.
PUMP.

APPLICATION FILED JUNE 12, 1906.



Witnesses
T. H. Alford
H. Hall

Inventor:
William F. Jacobs
by Cole Brown
Attys

UNITED STATES PATENT OFFICE.

WILLIAM F. JACOBS, OF OTTAWA, ILLINOIS.

PUMP.

No. 855,783.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM F. JACOBS, a citizen of the United States, of Ottawa, in the county of Lasalle and State of Illinois, have invented certain new and useful Improvements in Pumps; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in pumps of that kind wherein the handle is provided with a toothed segment which engages a rack carried by and secured on the pump-rod, and the invention consists in the matters hereinafter set forth and more particularly pointed out in the appended claims.

Among the objects of the invention is to provide a construction in pump operating mechanisms of this character whereby the lifting action of the pump-handle or lever is exerted, through said gear segment and rack, in line with the center of the pump-rod, thereby avoiding side thrust on the pump-rod and its guide bearings.

A further object of the invention is to provide an improved rack and gear connection between the pump-lever and rod, wherein the rack is adapted to be fixed to the rod but is capable of being detached from and sliding thereon to permit connection thereto of the operating rod of a windmill to reciprocate the pump-rod without disengaging said gear connections.

In the drawings:—Figure 1 is a side elevation of a pump embodying the several features of my invention. Fig. 2 is a cross-section taken on line 2—2 of Fig. 1. Fig. 3 is a cross-section taken on line 3—3 of Fig. 1. Fig. 4 is a front elevation of the hollow rack-bar which is mounted on the pump-rod. Fig. 5 is a cross-section taken on line 5—5 of Fig. 4.

As shown in the drawings,—A and B designate, respectively, upper and lower alined cylinders of a single acting, differential cylinder force pump, and C a distributing casting communicating with the cylinders A and B.

D designates a tubular support which extends downwardly through the platform E of the well and carries at its lower end the distributing casting in a manner to sustain the same and the cylinders from said platform.

F designates a reciprocating pump-rod connected in any suitable manner with the plungers of the cylinders.

G designates the discharge pipe of the pump which communicates at its lower end with the distributing casting chamber and extends through the platform and provided at its upper end with a laterally turned spout G¹.

The tubular support D is connected in any suitable manner with a base casting E¹ on the platform E in a manner to suspend said support from the platform, the casting being suitably apertured for the passage therethrough of the discharge pipe G and the pump-rod F (Fig. 4).

H designates the manual operating handle which is pivoted between the arms *d d* of a bracket D¹ that is fitted to the upper end of an integral extension D² of the tubular support D. The hinge or pivot for the handle consists of a pin *h* extending transversely through alined apertures in said bracket arms and through a hub or sleeve *h*¹ of said handle (Figs. 1 and 3).

The upper end of the pump-rod F has the form, as herein shown, of a flat bar F¹ having at its upper end an aperture *f* by which it may be connected in any suitable manner with the connecting or operating rod of a windmill or other motor adapted to actuate the same.

In accordance with my present construction, the pivot for the pump-handle is stationary or immovable, and power to reciprocate the pump-rod from the handle is transmitted through a rack and gear mechanism. The parts are so arranged that the handle may be operatively disconnected from the pump-rod without disturbing the pivot of the handle. The handle is formed to provide at its upper end a sector-shaped casting or head H¹ provided with curved gear teeth or cogs *h*² designed to mesh with the teeth *f*¹ of a straight rack F² carried by the upper end F¹ of the pump-rod. The said rack F² is detachably connected with the upper end of the pump-rod in such manner as to move with and form part of the rod when the pump is to be operated by hand power, but is adapted to be detached therefrom so that the rod will move relatively to or independently of the rack when the pump is to be operated by motor power, thereby disestablishing operative connection between the handle and pump-rod at a time when the pump is to be operated by motor power. As herein shown, said rack-bar is made longitudinally hollow and the pump-rod extends therethrough, as clearly shown in Fig. 2. The bar is adapted

for detachable connection with the pump-rod by means of a pin f^2 (Figs. 1 and 2) that extends transversely through the hollow bar and pump-rod. Said bar is provided with two
 5 sets of rack teeth f^1 , located one at each side thereof and formed on longitudinal flanges or ribs f^3 at the sides of the bar, and the gear segment of the handle is formed to provide
 10 laterally separated members h^3 , on each of which is formed a series of the gear teeth h^2 . The arms or members d of the bracket D^1 are extended in rear of the rack-bar at each side thereof to provide bearings for a pin I which carries a roller I^1 that bears against the rear
 15 face of the rack-bar in a manner to maintain the rack teeth in mesh with the teeth or cogs of the gear segment.

The teeth of the gear segment H^1 of the handle is so disposed with respect to the
 20 teeth of the rack-bar F^2 and the path of reciprocation of the pump-rod that the pitch line of the meshing teeth of the rack and gear is in the same vertical plane with the center line of the pump-rod. This arrange-
 25 ment insures that the lifting force exerted through the handle shall be in the direct line of the pump-rod, thus avoiding lateral thrust, such as would tend to unduly wear the bearing of the handle or to force the
 30 pump-rod out of its true lifting line of movement and thereby retard the action of the pump. A desirable form and arrangement of the rack-bar and gear segment to bring the pitch line of the meshing gear teeth in the
 35 plane of the center line of the pump-rod is embraced in the divided or notched segment member H^1 which partially embraces the bar F^2 carrying the rack teeth. It will be observed that said ribs extend laterally from
 40 the rack-bar a distance to provide rack teeth f^1 of the required lateral length and that the front or toothed faces of said ribs terminate short of the front face of the bar proper, thus bringing the pitch line of the rack teeth in the
 45 plane of the center line of the pump-rod. The arrangement of the rack teeth on both sides of the rack-bar, combined with the double row of gear segment teeth, has the further advantage of giving lateral balance
 50 to the pump-rod and avoiding lateral thrust which would be occasioned by the employment of but a single row of teeth.

In the use of the construction described, the gear segment of the handle remains permanently pivoted on the bracket D^1 . When
 55 the pump is to be operated by hand the rack-bar F^2 is locked to the pump-rod by the pin f^2 , thereby constituting, when so locked, the part of the pump-rod through which power is communicated to the rod to operate the
 60 pump. When the pump is to be operated by motor power the rack-bar F^2 is released from the pump-rod by removal of the pin f^2 , whereupon the upper part of the pump-rod is free to slide through the rack-bar, which
 65 latter is held stationary by reason of its engagement with the gear segment of the pump-handle.

I claim as my invention:—

1. In a pump, the combination with the
 70 pump rod adapted for connection at its upper end with a motor and a swinging pump handle, of a hollow rack-bar surrounding and having sliding engagement with the pump rod and provided with means for detachably
 75 fixing it to the pump rod, the rack teeth of said bar being located at the side of the bar and a gear segment carried by the handle and meshing with said rack, the pitch line of the rack and gear being located in the plane of
 80 the longitudinal axis of the pump rod.

2. In a pump, the combination with the
 pump rod adapted for connection at its upper end with a motor, and swinging pump
 handle, of a hollow rack-bar surrounding and
 85 adapted for sliding engagement with the pump-rod and provided also with means for detachably fixing it to the pump rod, said rack-bar being provided with two rows of gear teeth, one on each side of the bar, and a
 90 gear segment carried by the handle provided with two laterally separated curved series of gear teeth adapted for meshing engagement with the teeth of said rack, the pitch lines of the meshing gear and rack being in the plane
 95 of the longitudinal axis of the pump rod.

In testimony, that I claim the foregoing as my invention I affix my signature in presence of two witnesses, this 4th day of June A. D. 1906.

WILLIAM F. JACOBS.

Witnesses:

W. C. GLOVER,
 GLENN SHULER.