

No. 697,686.

Patented Apr. 15, 1902.

G. F. SPEER.  
PORTABLE CRANE.

(Application filed June 22, 1901.)

(No Model.)

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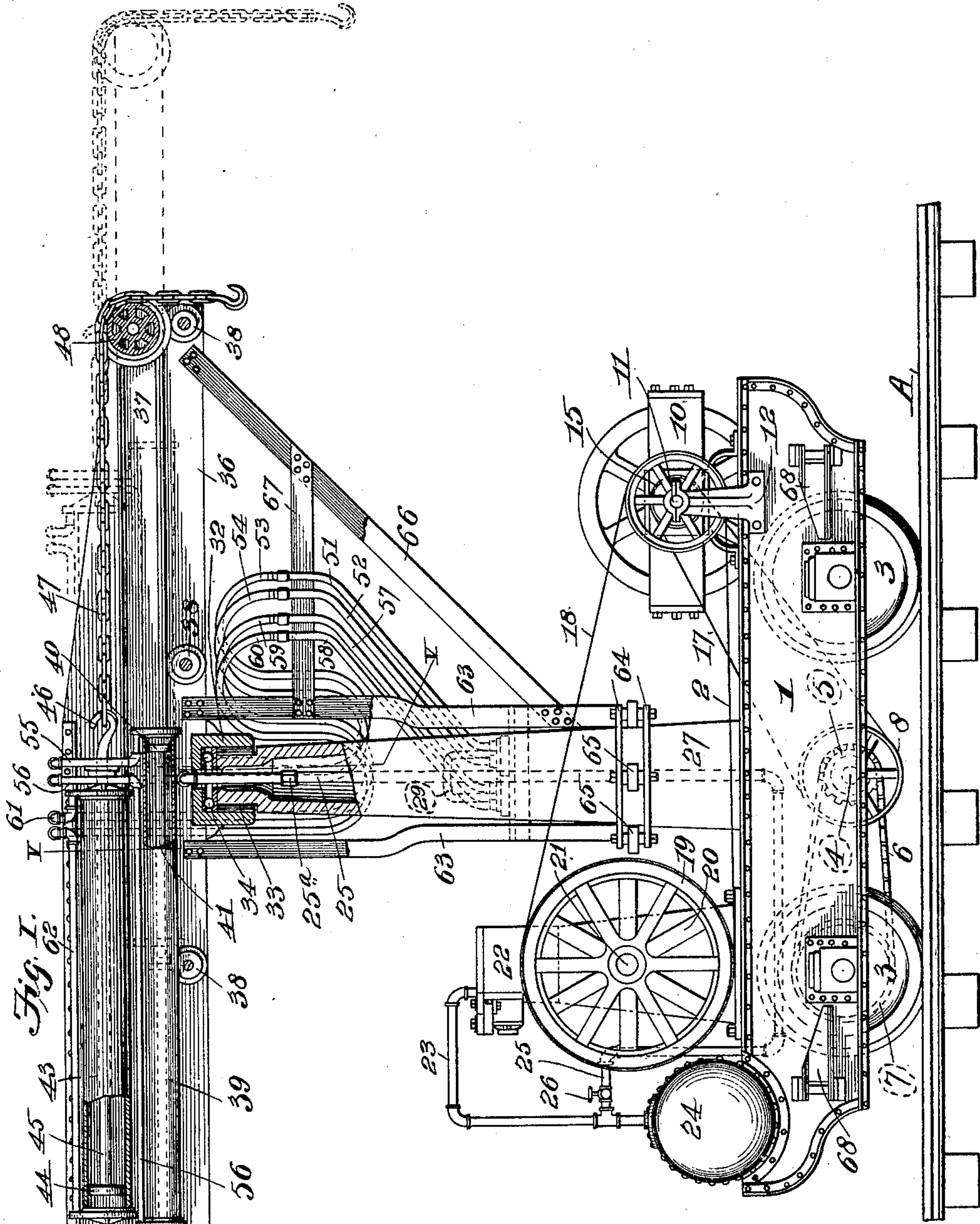


Fig. 1.

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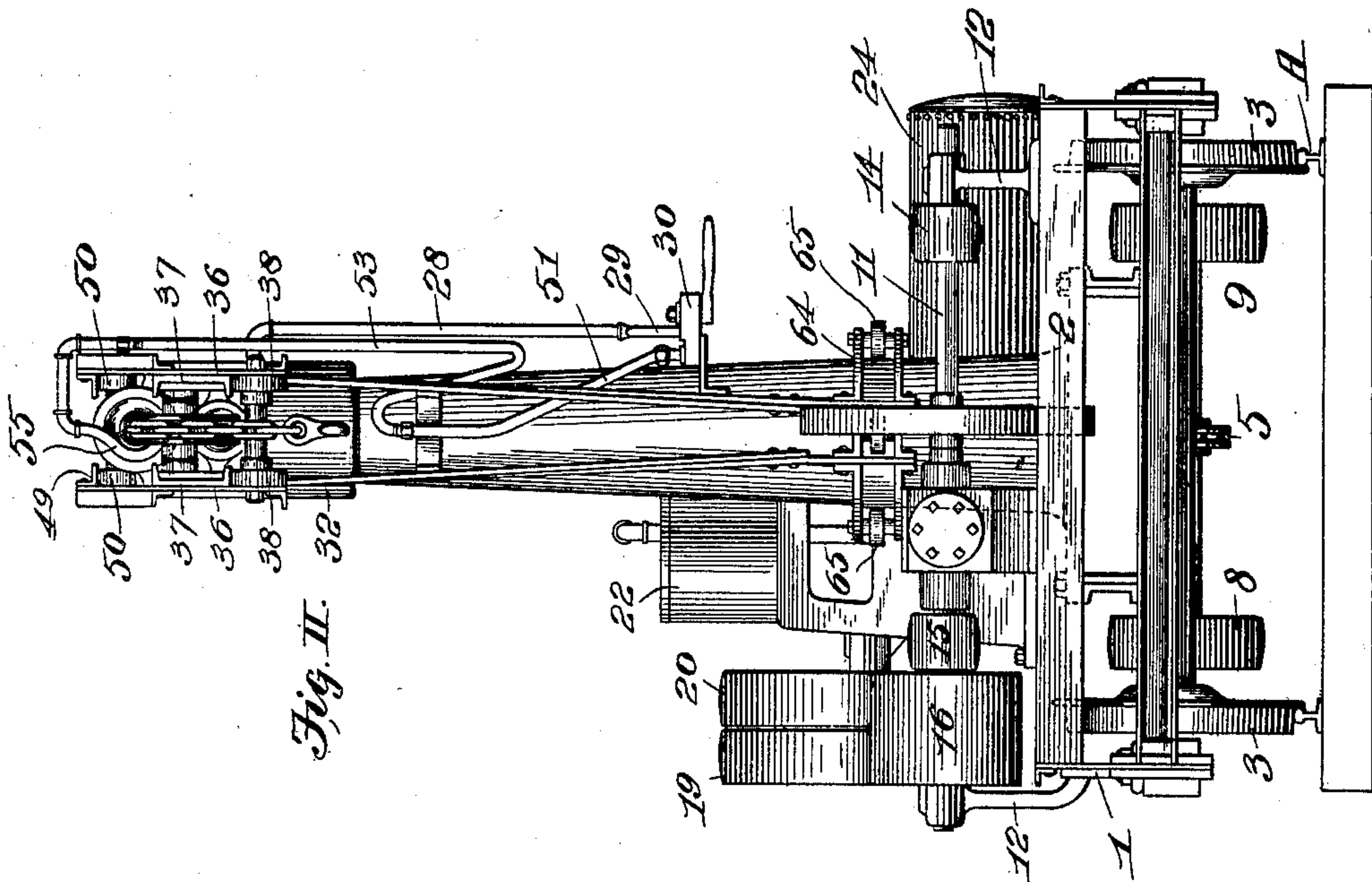
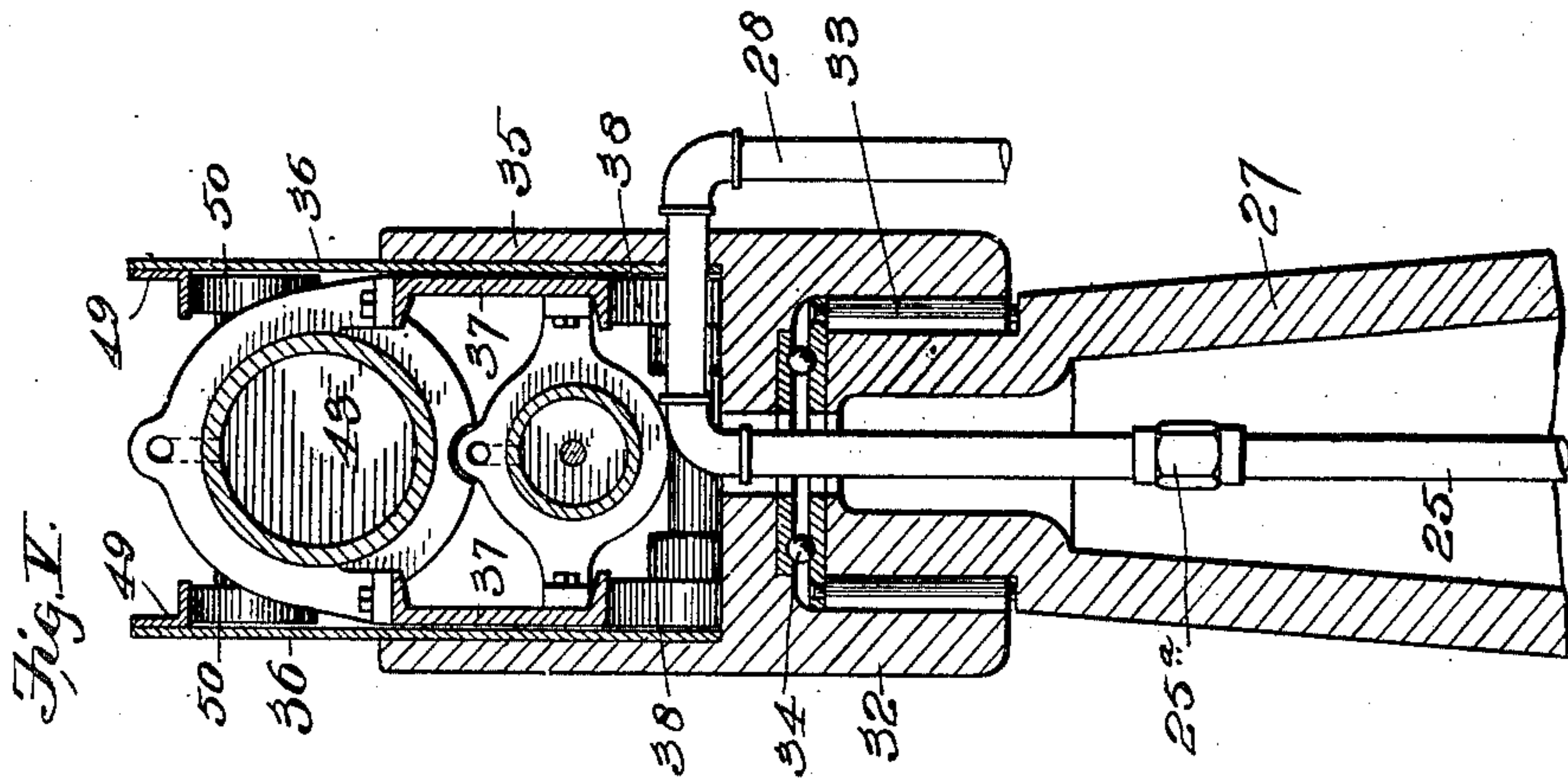
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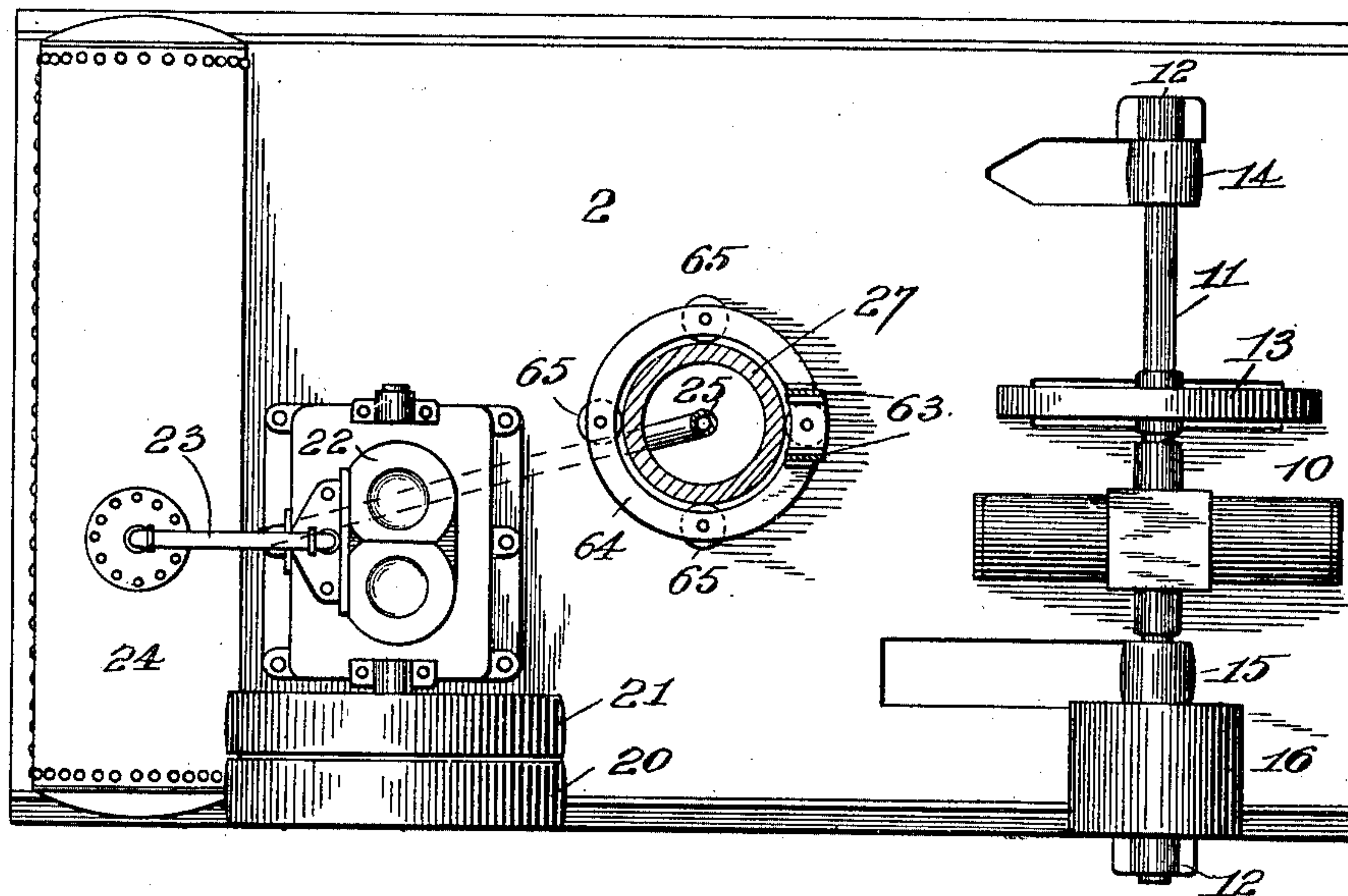
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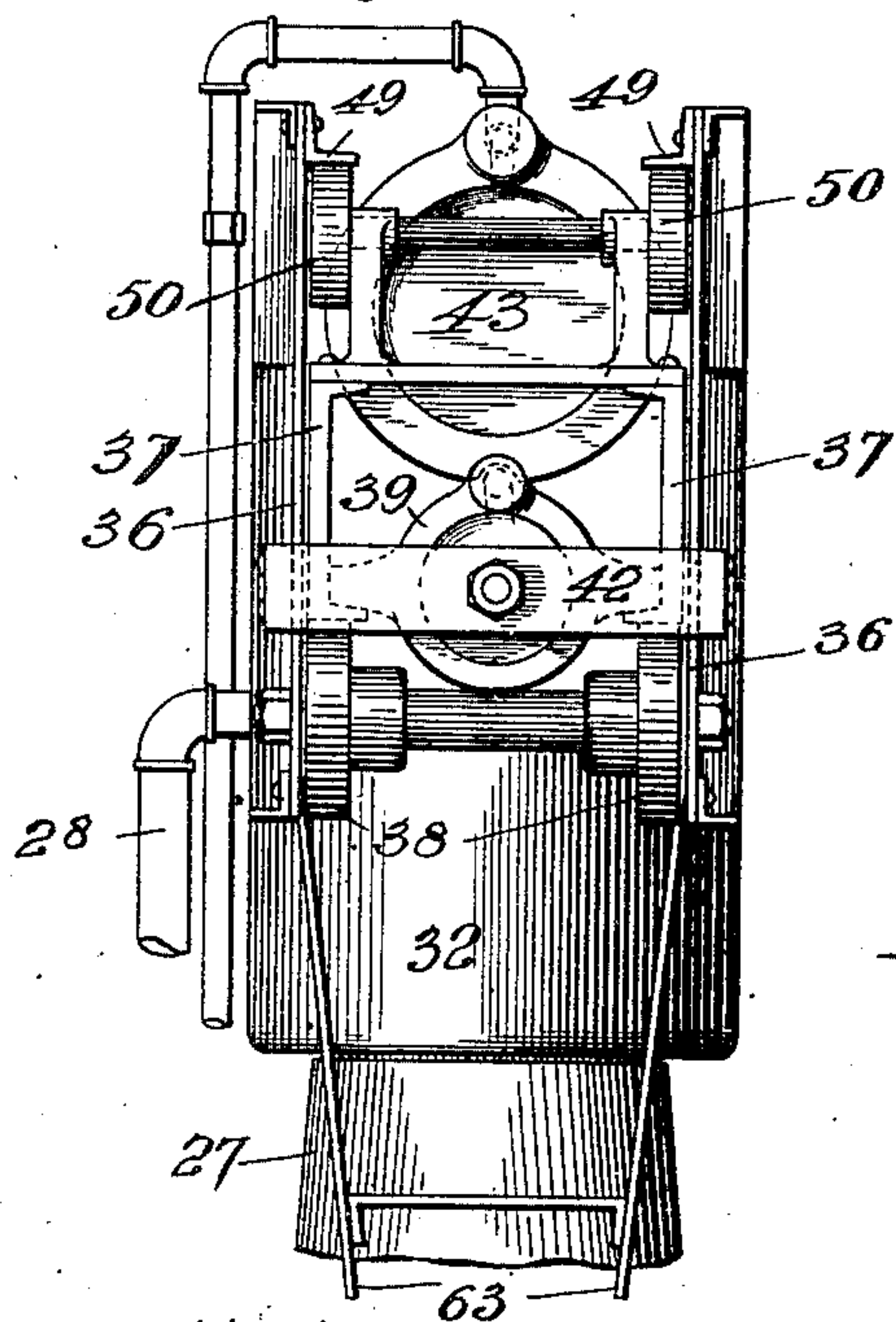
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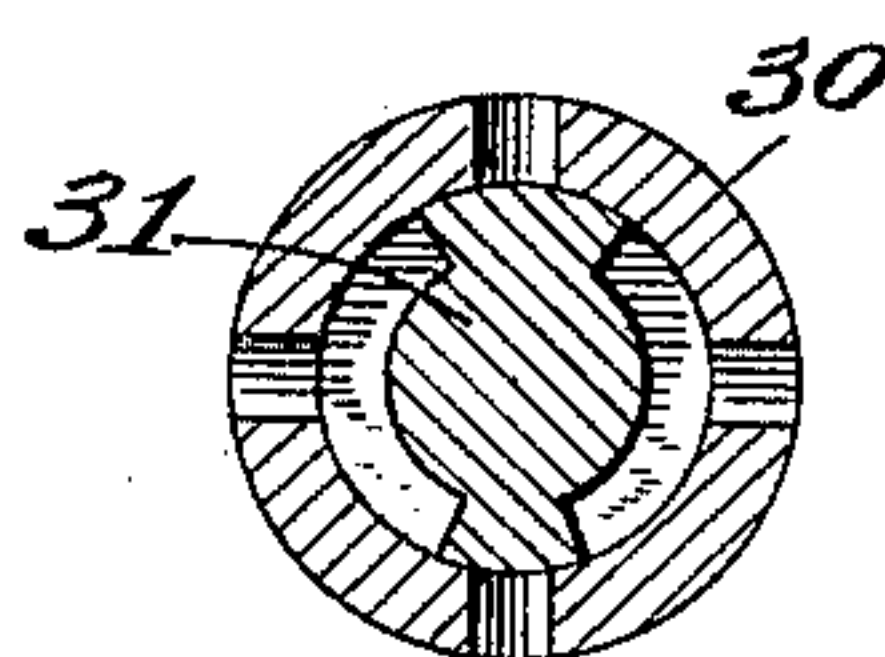
*Fig. III.*



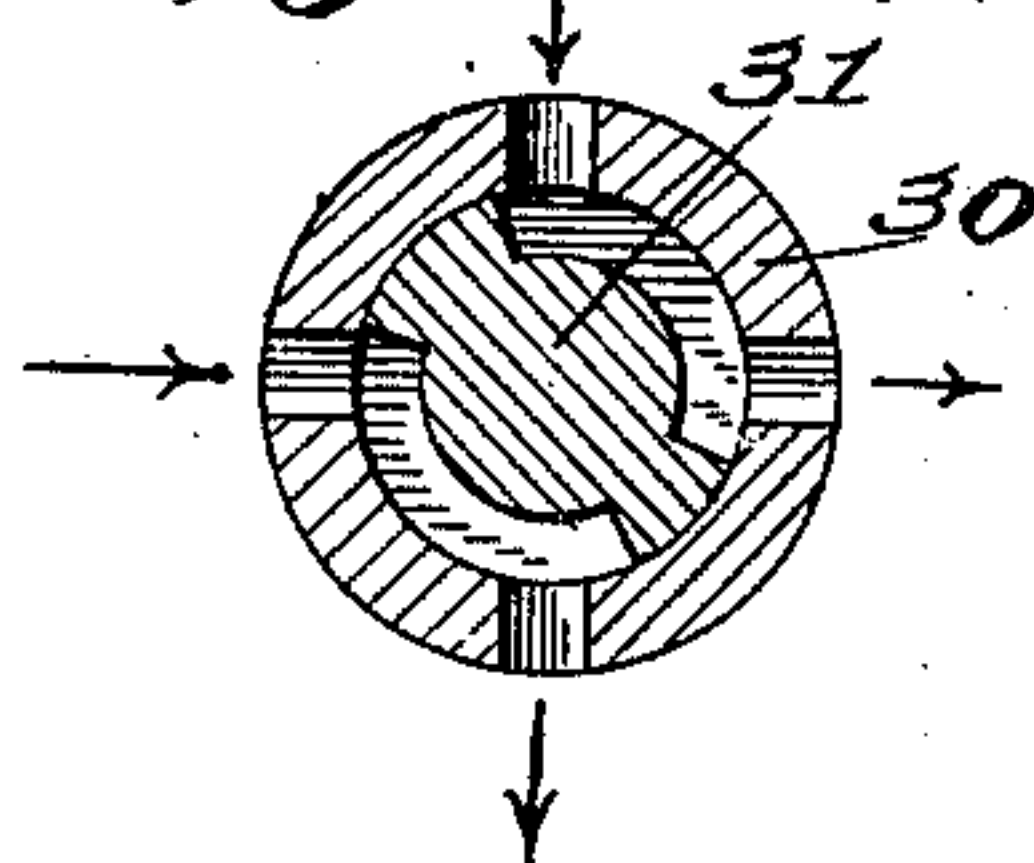
*Fig. IV.*



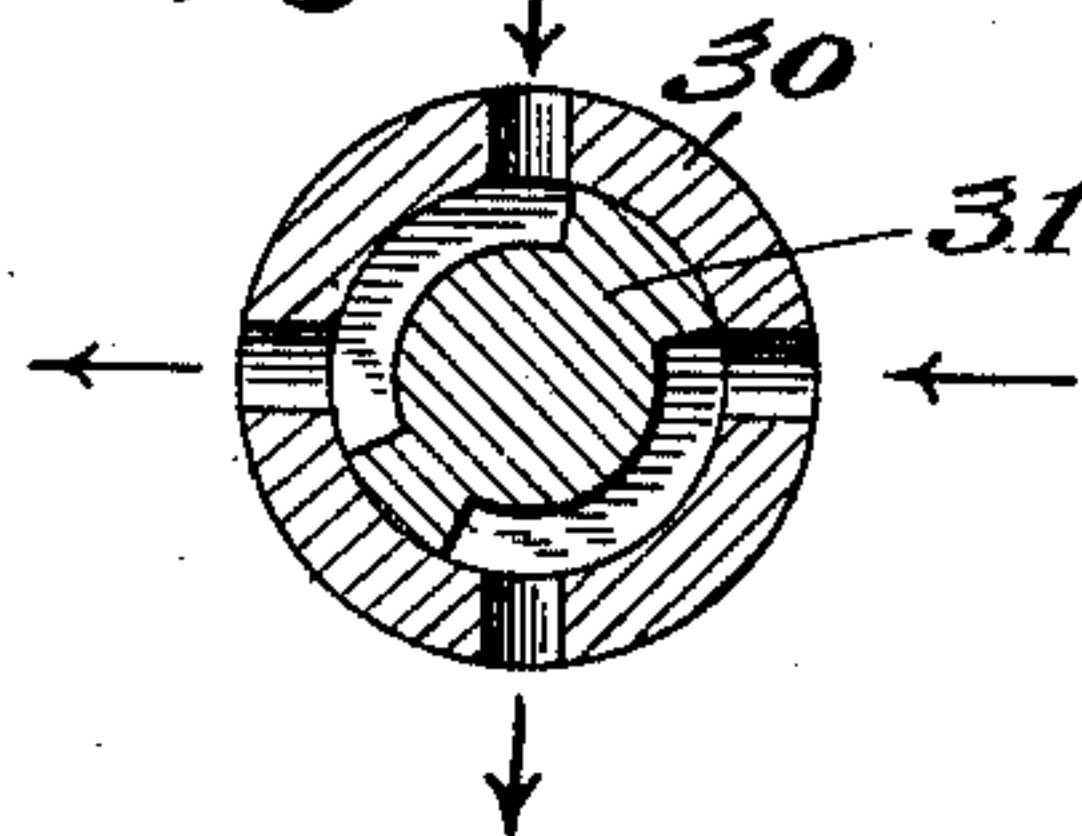
*Fig. VI.*



*Fig. VII.*



*Fig. VIII.*



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# UNITED STATES PATENT OFFICE.

GEORGE F. SPEER, OF ST. LOUIS, MISSOURI.

## PORTABLE CRANE.

SPECIFICATION forming part of Letters Patent No. 697,686, dated April 15, 1902.

Application filed June 22, 1901. Serial No. 65,613. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE F. SPEER, a citizen of the United States, residing in the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Portable Cranes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a portable crane designed for use upon railways, and more particularly intended for service in loading railway-cars, the construction being such that the hoisting apparatus is capable of telescoping outwardly and inwardly within a frame, so that the objects hoisted by the crane may be delivered through the door of a freight-car to place them in the car.

My invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is a view in side elevation and partly in vertical section of the crane. Fig. II is a front elevation. Fig. III is a view, partly in plan, of the truck of the frame and the parts mounted thereon, the crane-post being shown in horizontal section. Fig. IV is an enlarged end elevation looking at the rear of the crane at the top thereof. Fig. V is an enlarged vertical sectional view taken on line V V, Fig. I. Figs. VI, VII, and VIII are cross-sectional views of one of the valves that control the passage of air into the pipes by which it is conducted to the crane-cylinders.

1 designates a truck-frame having a platform 2 and mounted on wheels 3, adapted to travel on the railway-rails A. On a shaft 4, mounted in the truck-frame 1, is a toothed wheel 5, that is geared by a chain 6 to a toothed wheel 7 on the axle of one of the truck-wheels 3. Fixed to the shaft 4 are pulleys 8 and 9.

10 designates an engine of any suitable class, preferably gasoline, the driven shaft 11 of which is mounted in bearing-standards 12, supported by the truck. The shaft 11 is equipped with a fly-wheel 13 and pulleys 14, 15, and 16, from which power is communicated to drive the parts, as hereinafter specified. A straight belt 17 is applied to the pulley 15 and passes around the pulley 8 on the

shaft 4 to drive said shaft, and a crossed belt (not shown) is applied to the pulley 14 and passes around the pulley 9 on the shaft 4. By use of the straight and crossed belts referred to power is communicated from the engine-shaft 11 to the shaft 4 to impart rotation to said shaft 4 in either direction, so that the chain 6 may be caused to travel in either direction and rotate the axle to which the toothed wheel 7 is applied and cause the truck to be moved in a forward or backward direction on the track-rails, as desired.

The pulley 16 on the shaft 11 receives a belt 18, that leads to tight and loose pulleys 19 and 20 on the shaft 21 of an air-compressor 22, mounted on the truck-platform 2, the belt 18 being designed to furnish power to operate said air-compressor. The air compressed in the air-compressor 22 passes therefrom through a pipe 23 to a reservoir 24, in which the compressed air is stored.

25 is a compressed-air-conducting pipe connected to the pipe 23 and provided with a valve 26.

27 is a tubular post mounted on the truck-platform 2 and through which the air-conducting pipe 25 extends in an upwardly direction. The pipe 25 is constructed in sections and is united within the post 27 by a swivel union 25<sup>a</sup>, (see Figs. I and V,) so that the uppermost portion of said pipe is capable of rotation respecting the lowermost portion thereof. The air-conducting pipe 25 extends to the upper end of the post 27 and passes from the interior of the post to the exterior thereof and has connected to it a downwardly-extending pipe-leg 28, that leads to two branch pipes 29, which enter valve-housings 30, containing valves 31, said valves and housing being shown in detail in Figs. VI to VIII, inclusive. The valve-housings 30 have connected to them air-conveying pipes that will be hereinafter described.

32 designates a bearing-cap that fits over the upper end of the post 27 and contains vertically-arranged antifriction-rollers 33, that bear against the vertical face of said post at its upper end, and also antifriction-balls 34, on which the bearing-cap 32 rests and revolves. The bearing-cap 32 carries a pair of uprights 35. (See Figs. IV and V.)

36 designates beams fixed to the uprights



35, against the interior faces thereof. Slid-  
ably located within the uprights 35 is a pair  
of channel beams or carriers 37, that are slid-  
ably positioned on supporting-rollers 38, hav-  
ing their shafts journaled in the beams 36.

39 designates a pusher-cylinder fixed to the  
beams or carriers 37 and adapted to impart  
longitudinal movement to said carriers, as will  
hereinafter appear. The pusher-cylinder 39  
contains a piston 40, (see Fig. I,) that is car-  
ried by a piston-rod 41, which extends through  
a stuffing-box in the rear end of said cylinder  
and is connected to a cross-bar 42, attached  
to the beams 36, the parts being so disposed  
that the pusher-cylinder is capable of longi-  
tudinal movement with respect to the piston  
40 and its rod, which are held in a fixed po-  
sition, the pressure medium for the actuation  
of said pusher-cylinder being admitted there-  
to in the manner hereinafter set forth.

43 designates a hoist-cylinder fixed to the  
beams or carriers 37, as illustrated in Fig. V,  
and adapted to move with said carriers. With-  
in the hoist-cylinder 43 is a piston 44, carried  
by a piston-rod 45, that extends through the  
forward end of said cylinder and is provided  
with a hook 46, that receives a hoisting-chain  
47, which passes over a sheave 48, mounted in  
the carriers 37 and by which the load to be  
moved in the operation of the crane is lifted  
and carried. Fixed to the beams 36 is a pair  
of angle guides or retainers 49, that receive  
guide-rollers 50, carried by the carriers 37 and  
serve to prevent the upward movement of the  
rear end of said carriers and the cylinders  
carried thereby that would otherwise occur  
in the lifting of a load carried by the hoist-  
ing-chain 47.

51 and 52 designate pipes connected to one  
of the pair of valve-housings 30 and extend  
upwardly therefrom, and connected to these  
pipes are hose-sections 53 and 54. The hose-  
section 53 leads to a pipe 55, that is connected  
to the forward end of the pusher-cylinder  
39 and through which compressed air passes  
from said valve-housing to the forward end  
of said pusher-cylinder to admit the pressure  
medium in front of the piston 40 and cause  
said pusher-cylinder to be moved outwardly  
and move therewith the carriers 37, so that  
said carriers are shifted on their supporting-  
rollers 38, and the hoisting-chain-receiving  
sheave 48 is carried outwardly, as indicated  
in dotted lines, Fig. I, thereby increasing the  
length of the crane and permitting the de-  
posit of the article lifted at a greater distance  
from the axis of the crane than that at which  
it was picked up. The hose-section 54 is con-  
nected to a pipe 56, that leads to the rear end  
of the pusher-cylinder 39 and provides for  
the introduction of pressure medium at said  
end of the cylinder to exert power between the  
rear of the piston 40 and the rear end of said  
cylinder for the purpose of closing the rear-  
ward movement of said pusher-cylinder to ef-  
fect the return of the carriers 37 after they  
have been moved outwardly.

57 and 58 are pipes connected to the second  
valve-housing 30 to receive the compressed  
air entering said housing from the pipe-leg 28,  
and joined to the pipe 57 is a hose-section 59,  
that leads to a pipe 61, which enters the  
forward end of the hoist-cylinder 43 and de-  
livers pressure medium into said cylinder in  
front of the piston 44 therein to operate said  
piston in a rearward direction and to exert a  
pull on the hoisting-chain 47 to lift the load  
to be moved by the crane. The pipe 58 has  
joined to it a hose-section 60, that is connected  
to a pipe 62, which leads to the rear end of the  
hoist-cylinder 43 and provides for the intro-  
duction of pressure medium at said end of the  
cylinder, so that said pressure medium may  
exert power against the rear of the piston 44  
to move said piston forwardly in its cylinder.

It will be seen from the foregoing that the  
cylinders 39 and 43 being both connected to  
the carriers 37 they both travel with said car-  
riers when they are moved with the pusher-cyl-  
inder 39 and that the relative positions of said  
cylinders always remains the same. There-  
fore when a load is picked up by the hoisting-  
chain 47 it is maintained at a uniform eleva-  
tion when the carriers 37 are moved out-  
wardly.

To provide for the steadying of the revolv-  
ing crane members on the post 27, I utilize a  
frame composed of upright bars 63, that are  
joined to a pair of rings 64, which encircle  
the post at the lower end thereof and have  
journaled in them rollers 65, which travel on  
the post.

66 and 67 are bars that connect the upright  
bars 63 to the forward ends of the vertical  
plates 36.

68 designates swinging arms mounted on  
the truck-frame 1 and adapted to be swung  
outwardly therefrom to receive jacks placed  
thereunder by which the crane may be ele-  
vated from the track-rails A, if desired.

I claim as my invention—

1. In a crane, the combination of a hori-  
zontally-mounted support, a carrier telescop-  
ingly positioned within said support, hoist-  
ing means mounted on said carrier, and means  
for moving said carrier telescopingly within  
said support, substantially as and for the  
purpose set forth.

2. In a crane, the combination of a hori-  
zontally-mounted support, a carrier telescop-  
ingly positioned within said support, hoist-  
ing means mounted on said carrier, means for  
moving said carrier telescopingly within said  
support, and means mounted on said support  
adapted to prevent the tilting of said carrier  
when its forward end is projected beyond the  
forward end of the support, substantially as  
and for the purpose set forth.

3. In a crane, the combination of a recip-  
rocating carrier, means for supporting said  
carrier, a hoist-cylinder mounted on said car-  
rier, a lift piston and rod arranged to operate  
in said cylinder, a reciprocating pusher-cyl-  
inder fixed to said carrier and adapted to im-



part movement to the carrier, and a fixed piston and piston-rod on which said pusher-cylinder travels, substantially as described.

4. In a crane, the combination of a reciprocating carrier, means for supporting said carrier, a hoist-cylinder mounted on said carrier, a lift piston and rod arranged to operate in said hoist-cylinder, a reciprocating pusher-cylinder fixed to said carrier and adapted to travel therewith, a piston in said pusher-cylinder, and a piston-rod by which said last-named piston is connected to said carrier-support, substantially as described.

5. In a crane, the combination of a pair of rotatably-mounted beams, a pair of carriers reciprocally mounted between said beams, a pusher-cylinder fixed to said carriers and adapted to move therewith, a piston in said pusher-cylinder, a piston-rod having a fixed connection to said beams and to which said piston is connected, a hoisting-cylinder fixed to said carriers and arranged to move therewith, a piston in said hoist-cylinder, and a lifting piston-rod carried by said last-named piston, substantially as described.

6. In a crane, the combination of a reciprocating carrier, a support for said carrier, supporting-rollers on which said carrier is mounted, means for reciprocating said carrier, hoisting means mounted on said carrier, a guide-roller on said carrier and guides mounted on said carrier, supporting means adapted to receive said guide-roller, substantially as described.

7. In a crane, the combination with means for providing pressure medium, of valve-housings adapted to receive pressure medium, valves in said housings, pipes leading from said valve-housing, a carrier-support, a reciprocating carrier mounted on said support, a pusher-cylinder attached to said carrier and to which a portion of said pipes lead, and a hoist-cylinder to which the remainder of said pipes lead, substantially as described.

In testimony whereof I have hereunto set my hand this 19th day of June, 1901.

GEO. F. SPEER.

In presence of—

E. S. KNIGHT,  
M. P. SMITH.