No. 860,208. PATENTED JULY 16, 1907.

A. H. GIBSON.

ELECTROPNEUMATIC TRACK CHANNELER.

APPLICATION FILED JAN. 11, 1907.

4 SHEETS—SHEET 1.

Fig. 1.

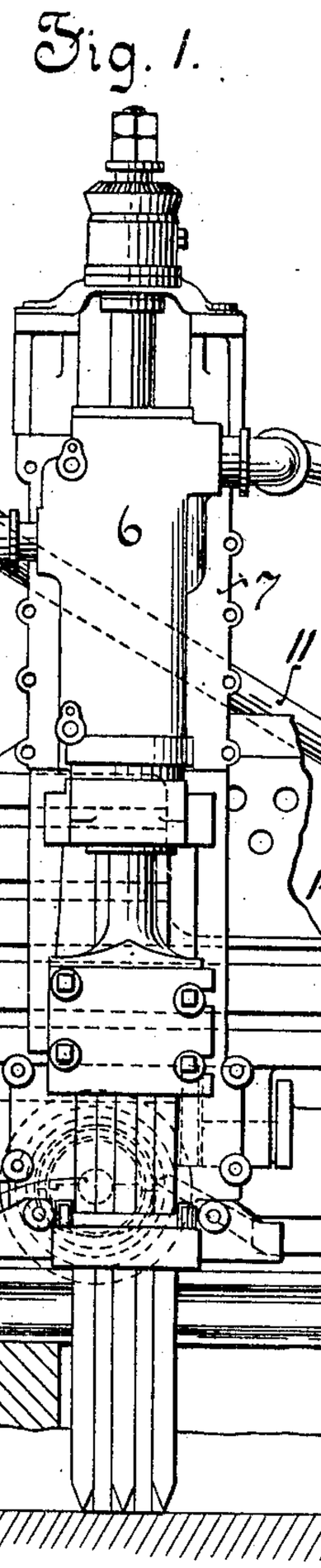
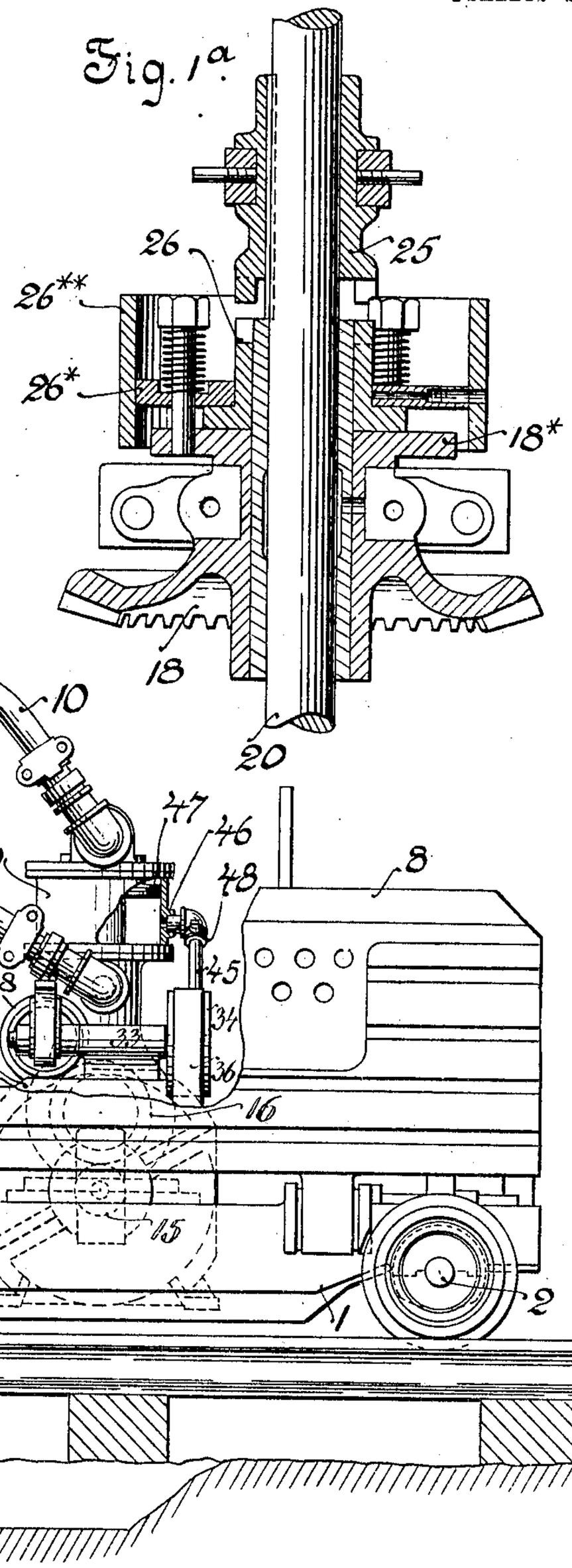


Fig. 1ª.



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4 SHEETS—SHEET 2.

Fig. 2.

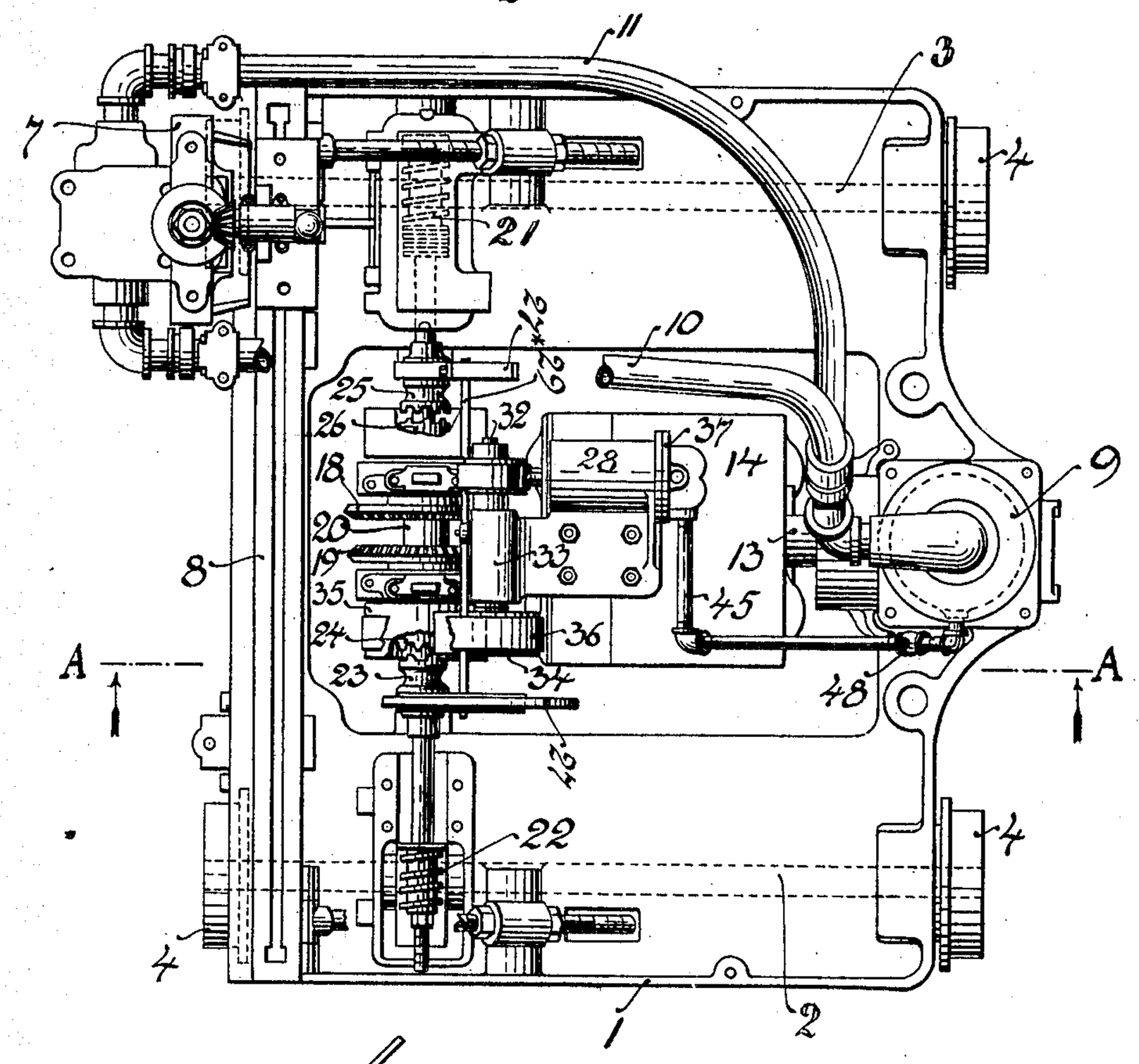


Fig. 2a.

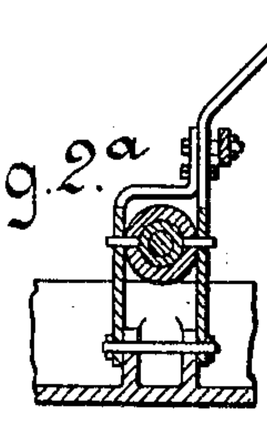


Fig. 2c.

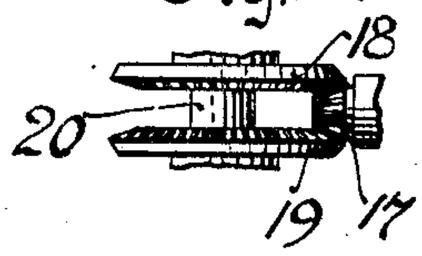
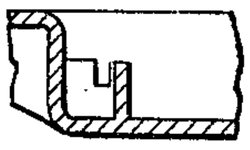


Fig. 2b.



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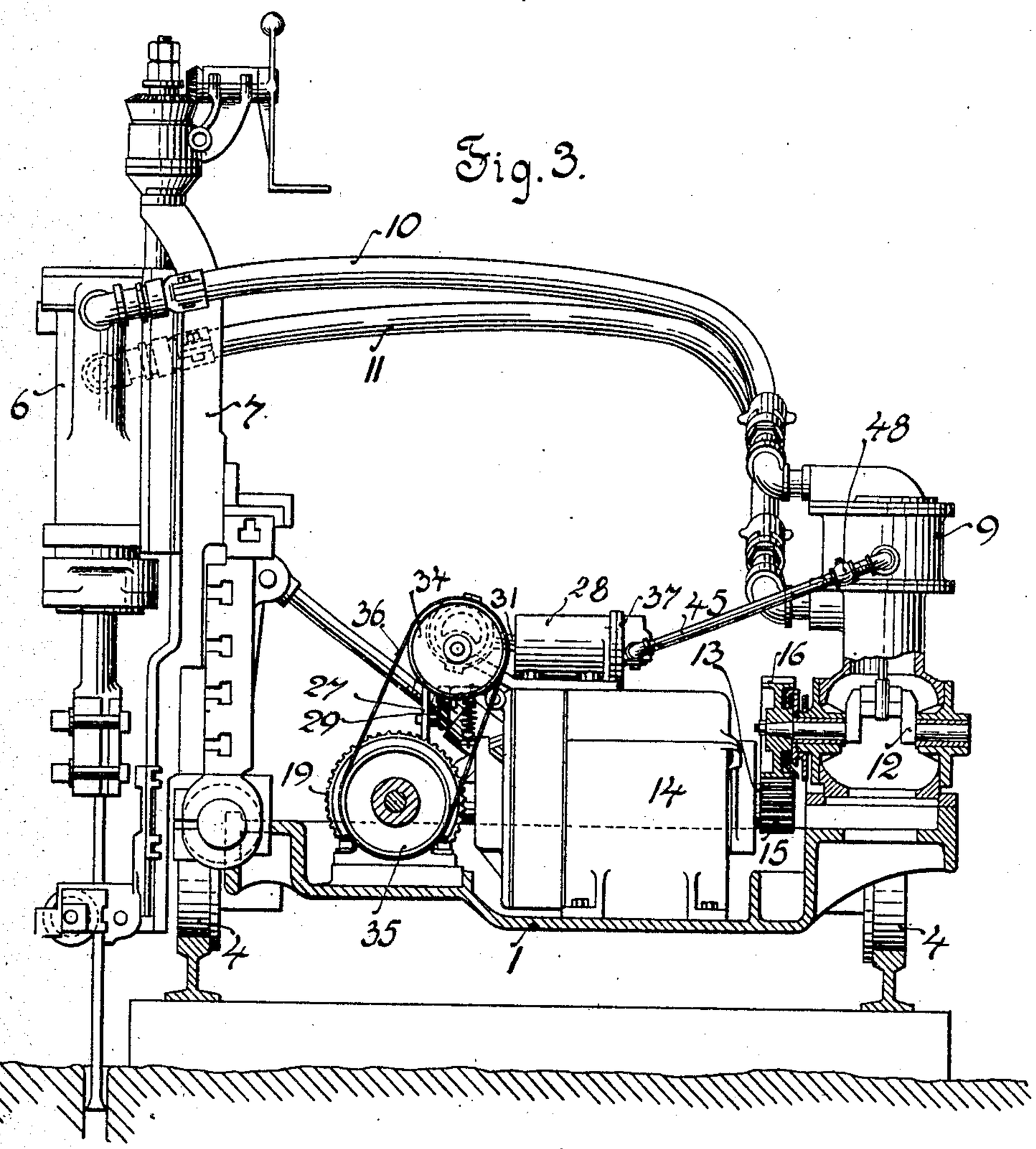
4 SHEETS—SHEET 3.

Fig. 3.



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4 SHEETS—SHEET 4.

Fig. 4.

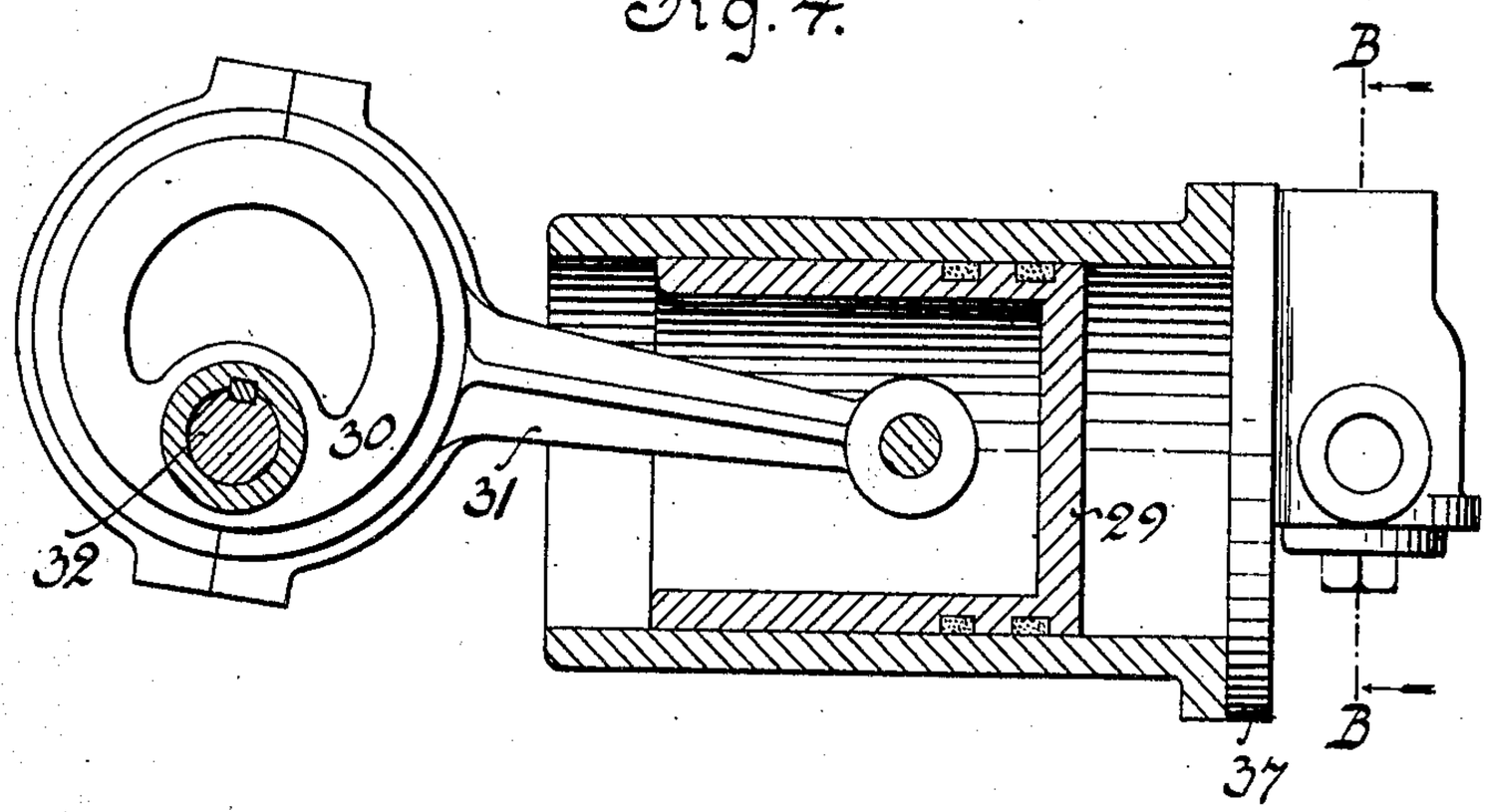


Fig. 5.

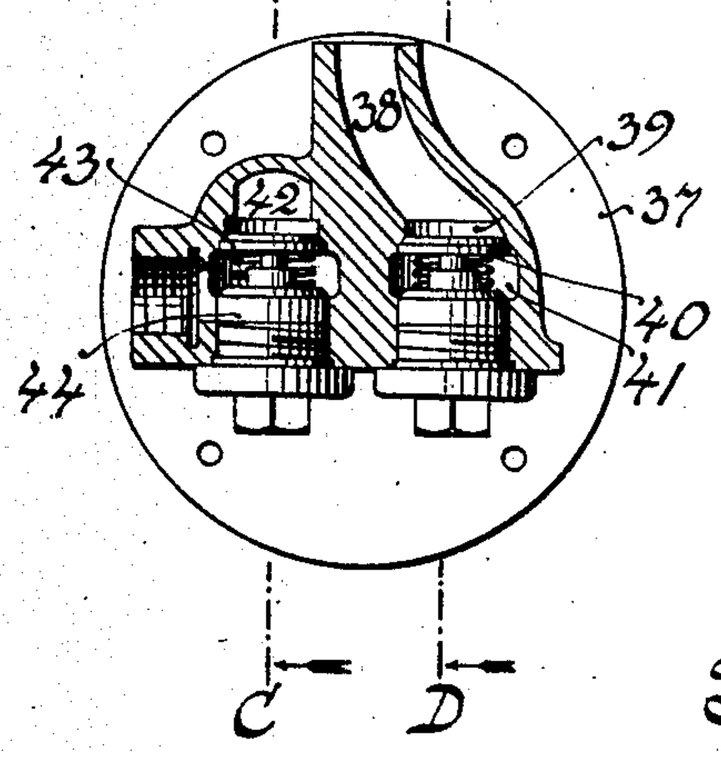


Fig. 6.

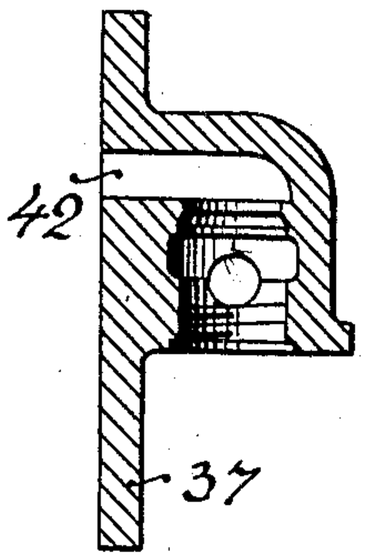


Fig. 7.

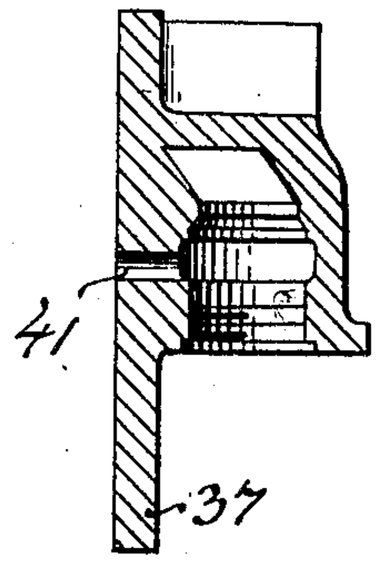
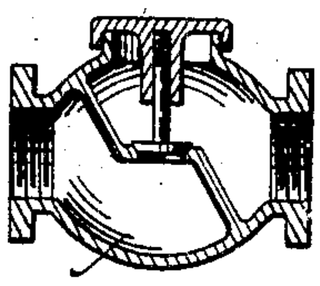


Fig. 8.



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UNITED STATES PATENT OFFICE.

ARTHUR H. GIBSON, OF EASTON, PENNSYLVANIA, ASSIGNOR TO INGERSOLL-RAND COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

ELECTROPNEUMATIC TRACK-CHANNELER.

No. 860,208. Specification of Letters Patent. Patented July 16, 1907.

Application filed January 11, 1907. Serial No. 351,792.

To all whom it may concern:

Be it known that I, ARTHUR H. GIBSON, a subject of the King of Great Britain, and a resident of Easton, in the county of Northampton and State of Pennsylvania, have invented a new and useful Improvement in Electropneumatic Track-Channelers, of which the following is a specification.

This present invention relates to that class of machinery in which an air pressor is utilized for reciprocating columns of air to operate a percussive tool and has for its object to provide means independent of the pressor for raising the air pressure in the system so that the effectiveness of the pressor is increased and thereby causes the percussive tool to strike a harder blow than where atmospheric pressure only is utilized in the system.

A further object is to provide a device of the above character in which the pressor and an air pump independent of the pressor, are driven by a common motor.

A still further object is to provide a device of the above character in which the truck which forms a support for the several parts, the air pressor and the air pump are all three driven by a common motor.

A practical embodiment of my invention is represented in the accompanying drawings in which

Figure 1 represents the channeler in front elevation, a portion of the swinging truck frame being broken away to more clearly show the parts back of the same, Fig. 1ª is an enlarged detail section showing one of the clutches and its adjacent parts, Fig. 2 is a top plan view of the channeler, certain of the parts being broken away to more clearly show the parts beneath the same, Figs. 2ª and 2ᵇ are detail sections showing the manner of mounting the clutch operating levers, Fig. 2ᶜ is a detail view showing the geared connection between the motor gear and the truck gears, Fig. 3 is a vertical section through the channeler in the plane of the line A—A of Fig. 2, looking in the direction of the arrows, Fig. 4 is an enlarged detail view of the independent air pump and its operating means, Fig. 5 is a section taken through the housing for the inlet and discharge valves of the pump, in the plane of the line B—B of Fig. 4, looking in the direction of the arrows, Fig. 6 is a section taken in the plane of the line C—C of Fig. 5, looking in the direction of the arrows, the discharge valve being removed, Fig. 7 is a section taken in the plane of the line D—D of Fig. 5, looking in the direction of the arrows, the inlet valve being removed, and Fig. 8 is a detail section of the check valve.

I have shown my invention in connection with an electro-pneumatic track channeler. The truck which carries the parts is denoted by 1 and it is provided with two axles 2 and 3, each axle being provided with a pair of traction wheels 4. The truck is fitted to reciprocate on a track 5 laid in position to bring the channeler in proper relation to its work. The percussive tool cylinder, in the present instance the channeler cylinder, is denoted by 6 and it is mounted on a shell 7 which is adjustable on a swinging back frame 8 hinged to the truck 1. The air pressor is mounted on the truck and its cylinder is denoted by 9. The pressor is connected to the percussive tool cylinder 6 by two flexible tubes 10, 11, whereby the pressor may be caused to operate the tool by reciprocating columns of air. The crank shaft 12 of the pressor is driven from the shaft 13 of a motor such, for instance, as an electric motor 14, by means of gears 15, 16. The motor 14 is also used to reciprocate the truck by the following means. The shaft 13 of the motor is provided with a pinion 17 which is arranged to drive two bevel gears 18, 19, in opposite directions, which bevel gears are loosely mounted on a horizontal drive shaft 20 having geared connections 21, 22 with the truck axles 2, 3. The bevel gears 18, 19, form part of two friction clutches the sliding members 23, 25 being keyed to rotate with the shaft 20 and arranged to be interlocked with the friction members 24, 26 of the said gears. Each of these friction members is arranged as shown in Fig. 1ª which illustrates the clutch 25, 26 in which the member 26 normally rotates with its gear 18 by being frictionally clamped between a flange 18* of the gear 18 and a spring pressed ring 26* secured to the interior of a cylindrical casing 26**. These two movable clutch members have operating levers 27, 27*, connected by a rod 29 so that they are moved simultaneously. When the lever 27 is in its intermediate position, both of the clutches are disengaged and the truck will remain at rest even though the motor be running. When the lever 27 is moved into position to throw the clutch member 23 into engagement with its corresponding clutch member, the truck will be driven by the motor in one direction and when the lever 27* is thrown into position to bring the clutch member 25 into engagement with its corresponding clutch member the clutch will be driven in the opposite direction.

Means independent of the pressor are provided for raising the pressure of air therein, which means in the present instance comprises an air pump 28 which is driven from the motor 14 as follows. This pump 28 is carried by the truck 1, in the present instance by being mounted upon the motor 14. The pump piston is denoted by 29 and it is reciprocated by an eccentric 30 and pitman 31 from a shaft 32 mounted in suitable bearings in the supporting bracket 33. This shaft 32 is driven from the motor 14 in the present instance by providing the shaft with a pulley 34 and the movable clutch member 24 with a pulley 35, around which

pulleys a driving belt 36 passes. It will thus be seen that the shaft 32 is rotated through the motor pinion 17 and gear 19. This pump 28 is provided with a valve chest 37 having an inlet 38 from atmosphere which leads to a port 39 closed by an inlet valve 40. A port 41 leads from the top of the inlet valve into the pump cylinder. A port 42 leads from the pump cylinder to the bottom of the discharge valve 43 and the discharge valve port 44 leads from the top of the valve 43 to a pipe 45 which leads to a port 46 which opens into the interior of the pressor cylinder 9 at a point where the said port 46 is alternately opened to the opposite sides of the pressor piston 47 as the pressor piston is reciprocated. A check valve 48 is located in the pipe 45 at a predetermined distance from the pressor cylinder 9 to produce the desired results.

It has been found that the system works to better effect where the pressure of air in the system is kept above atmospheric pressure. This raising of the pressure is accomplished by the air pump herein described.

It will be seen that if there is too much pressure on the side of the pressor piston which produces the up stroke of the tool, the check valve may be moved close to the pressor cylinder and if the reverse be true, the check valve may be moved a greater distance from the pressor cylinder. This may be accomplished by changing the lengths of the two sections of the pipe 45 which connect the check valve to the pump and pressor cylinder, respectively. It is also evident that the port 46 in the pressor cylinder may be located at the desired position to insure the proper application of the additional air pressure to produce the best results for overcoming the loss of pressure in the system due to leakage. It is also obvious that the relative proportions of the belt pulleys which operate the air pump may be varied to obtain the feeding of the additional air pressure at the desired intervals.

It is evident that various changes might be resorted to in the construction, form and arrangement of the several parts; hence I do not wish to limit myself strictly to the construction herein set forth, but

What I claim is:

1. In combination, a percussive tool, an air pressor for operating it by reciprocating columns of air, an air pump independent of the pressor for raising the pressure therein, and a common motor for driving the pressor and pump.

2. In combination, a truck, a percussive tool, an air pressor for operating it by reciprocating columns of air, means independent of the pressor for raising the pressure therein and a common motor for driving the pressor and truck.

3. In combination, a truck, a percussive tool, an air pressor for operating it by reciprocating columns of air, an air pump independent of the pressor for raising the pressure therein, and a common motor for driving the pressor and pump.

4. In combination, a truck, a percussive tool, an air pressor for operating it by reciprocating columns of air, an air pump independent of the pressor for raising the pressure therein and a common motor for driving the pressor, the pump and the truck.

5. In combination, a truck, its drive shaft, a percussive tool, an air pressor for operating it by reciprocating columns of air, means independent of the pressor for raising the pressure therein, a common motor for driving the pressor and truck, clutches on the truck drive shaft and means for causing one or the other of the clutches to connect the motor shaft to the drive shaft for driving the truck in either direction at pleasure.

6. In combination, a truck, its drive shaft, a percussive tool, an air pressor for operating it by reciprocating columns of air, an air pump independent of the pressor for raising the pressure therein, a common motor for driving the pressor, the pump and the truck, clutches on the truck drive shaft and means for causing one or the other of the clutches to connect the motor shaft to the drive shaft for driving the truck in either direction at pleasure.

7. In combination, a truck, its axles, a drive shaft having worm gear connections with the axles, a percussive tool, an air pressor for operating it by reciprocating columns of air, means independent of the pressor for raising the pressure therein, a common motor for the pressor and truck, clutches on the truck drive shaft and means for causing one or the other of the clutches to connect the motor shaft to the drive shaft for driving the truck in either direction at pleasure.

8. In combination, a truck, its axles, a drive shaft having worm gear connections with the axles, a percussive tool, an air pressor for operating it by reciprocating columns of air, an air pump independent of the pressor for raising the pressure therein, a common motor for driving the pressor, the pump and the truck, clutches on the drive shaft and means for causing one or the other of the clutches to connect the motor shaft to the drive shaft for driving the truck in either direction at pleasure.

9. In combination, a percussive tool, an air pressor for operating it by reciprocating columns of air, an air pump independent of the pressor for raising the pressure therein, said pump having a pipe leading to the pressor, a check valve located in said pipe at the desired distance from the pressor and a common motor for driving the pressor and pump.

10. In combination, a truck, a percussive tool, an air pressor for operating it by reciprocating columns of air, an air pump independent of the pressor for raising the pressure therein, said pump having a pipe leading to the pressor, a check valve located in said pipe at the desired distance from the pressor and a common motor for driving the pressor, the pump and the truck.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this 9th day of January 1907.

ARTHUR H. GIBSON.

Witnesses:
HENRY THIEME,
F. GEORGE BARRY.