

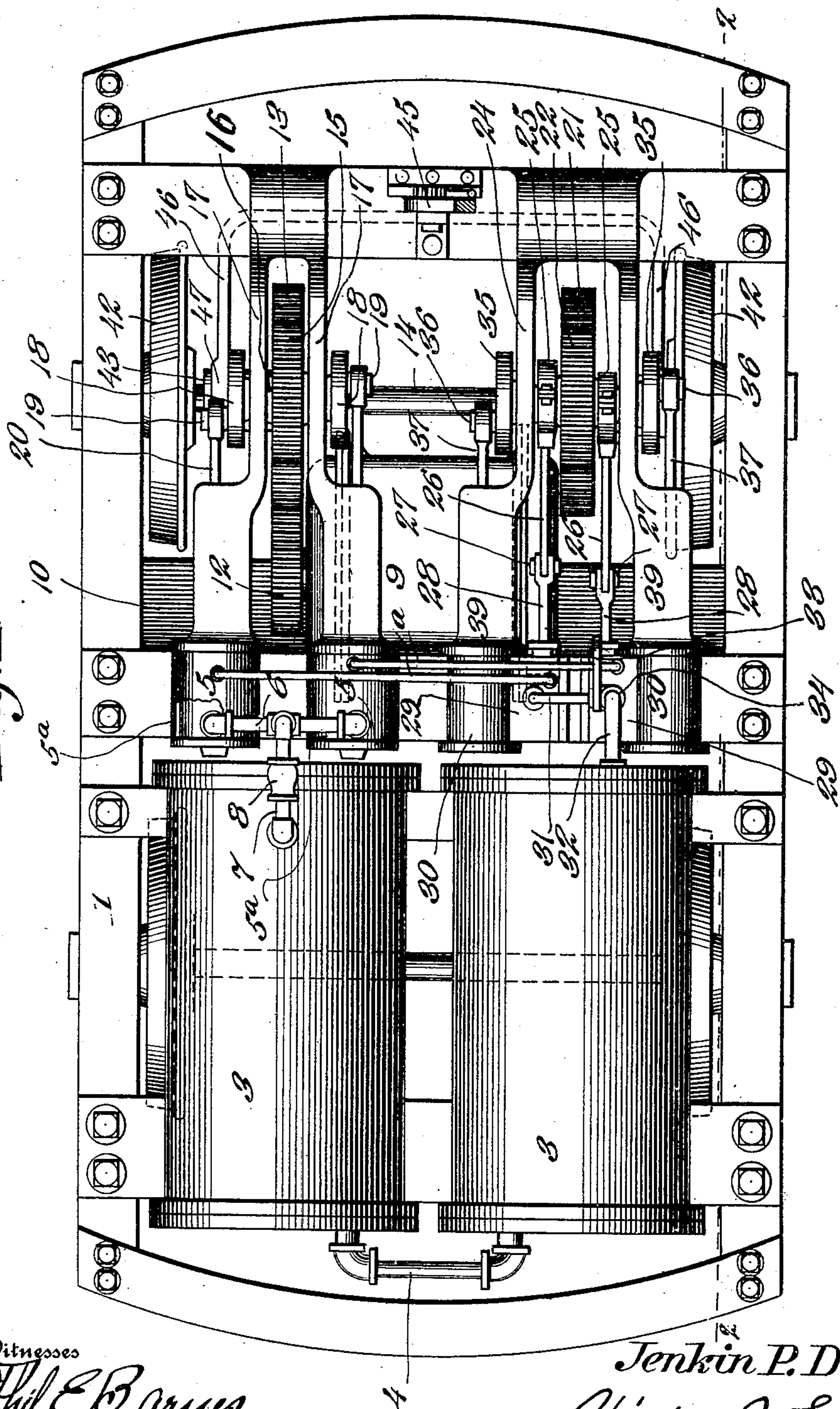
J. P. DAVIS.  
TRACTION ENGINE.  
APPLICATION FILED JULY 21, 1908.

935,589.

Patented Sept. 28, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



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Jenkin P. Davis

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Witnesses

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Fig 2.

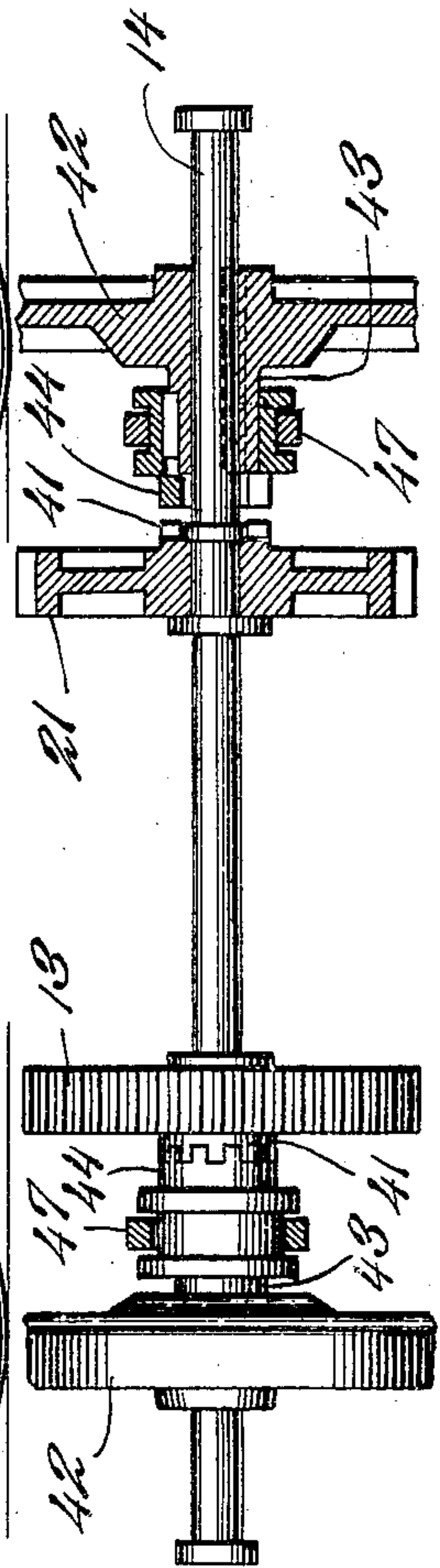
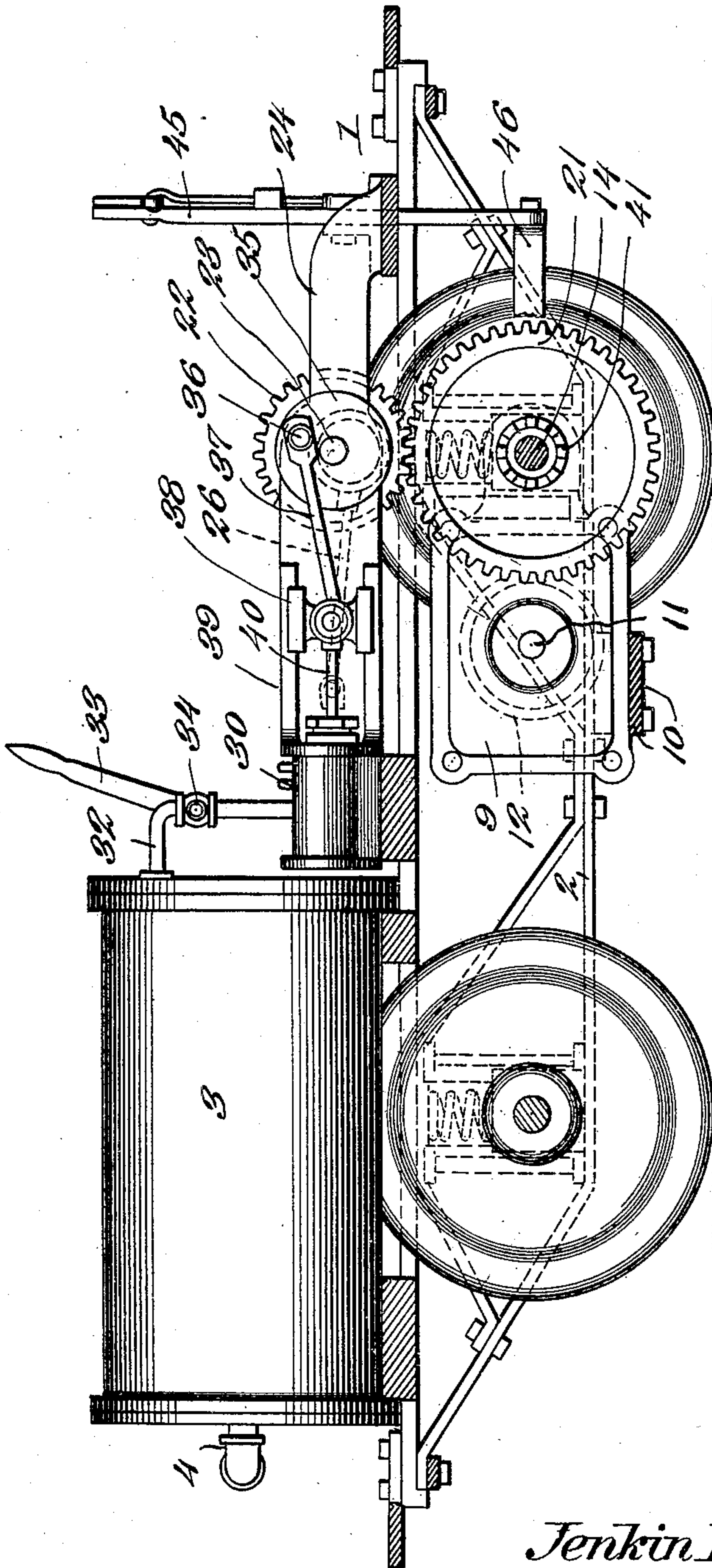


Fig. 3.

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# UNITED STATES PATENT OFFICE.

JENKIN P. DAVIS, OF OLMSTED, WEST VIRGINIA.

## TRACTION-ENGINE.

935,589.

Specification of Letters Patent.

Patented Sept. 28, 1909.

Application filed July 21, 1908. Serial No. 444,576.

*To all whom it may concern:*

Be it known that I, JENKIN P. DAVIS, a citizen of the United States of America, residing at Olmsted, in the county of McDowell and State of West Virginia, have invented new and useful Improvements in Traction-Engines, of which the following is a specification.

This invention relates to traction engines designed for the purpose of hauling cars in and around mines, and one of the principal objects of the invention is to provide a locomotive or traction engine which may be run by an electric motor when on the outside or in the open air and which may be readily converted into a compressed air locomotive for running around inside of the mines where explosive gases are liable to accumulate and where a sparking device connected to the motor might cause an explosion.

Another object of the invention is to provide a simple, strong, durable and compact locomotive for work in and about a mine which will operate as an electric engine to store compressed air and which may be readily converted from an electric engine to a compressed air engine to use the air compressed by the electric motor.

These and other objects may be attained by means of the construction illustrated in the accompanying drawings, in which,—

Figure 1 is a plan view of a traction engine made in accordance with my invention. Fig. 2 is a longitudinal sectional view of the same on the line 2—2 of Fig. 1. Fig. 3 is an elevation of the front axle, showing one of the traction wheels, a clutch and a gear wheel in section.

Referring to the drawings, the numeral 1 designates the framework of the engine, which is made of suitable shape for supporting the various parts, and 2 designates braces underneath the frame for supporting the bolsters and the running gear. Mounted upon the frame of the engine is a pair of compressed air reservoirs 3 which are connected by a communicating pipe 4. Connected to one of the cylinders 3 is a pair of compressed air pumps 5 which are connected together by means of a communicating pipe 6 from which extends a branch pipe 7. A check valve 8 is connected to the pipe 7, said check valve permitting the air to be forced into the tank 3 and to prevent its escape through said valve. An electric motor 9 is supported upon a cross bar 10 form-

ing part of the framework of the engine below the platform, and upon the main shaft 11 of the motor is a gear wheel 12 which meshes with a large gear wheel 13 on the front axle 14. The gear wheel 13 meshes with a pinion 15 mounted upon a stub shaft 16 journaled in frame bars 17. Crank disks 18 mounted on the shaft 16 are provided with crank pins 19 to which the piston rods 20 are attached.

Mounted on the shaft 14 is a large gear wheel 21 which meshes with a pinion 22 secured to a shaft 23 mounted in the frame bars 24. Eccentrics 25 are mounted on the shafts 23, and attached to these eccentrics are connecting rods 26, said connecting rods being pivoted at 27 to the piston rods 28 reciprocating in chests 29 at the sides of the cylinders 30. The chests 29 are connected by a pipe 31, and a pipe 32 leads into the compressed air tank 3. A lever 33 operates a valve 34 for controlling communication between the chests and the tank. On the outer ends of the shaft 23 crank disks 35 are fixed, and connected to the crank pins 36 are connecting rods 37 for operating the cross heads 38 mounted in guides 39. Connected to the cross heads 38 are the piston rods 40 which are operated by the pistons in the cylinder 30.

On the shaft 14 the gear wheels 15 and 21 are each provided with a clutch element 41. The traction wheels 42 are each provided with an inwardly extending sleeve 43, and sliding on this sleeve is a clutch member 44. A lever 45 disposed centrally to the frame is operable to throw one of the clutches into engagement and to disengage the other simultaneously, said lever being connected to a yoke 46 provided with forked ends 47 which engage the clutch elements 44 to move them into and out of engagement. By means of this construction the lever 45 may be operated to throw the electric motor out of operation and at the same time throw into operation the compressed air engine, or vice versa. The exhaust from the compressed air engine is carried through pipes *a* to the cooling chambers 5<sup>a</sup> surrounding the cylinders. It will be understood that an engine of this kind must be reversible in order to meet general requirements.

When the engine is running upon the outside the electric motor is utilized, and the excess of power is used for storing compressed air in the tanks 3. When the engine



is used on the inside, the lever 40 is operated to shift the clutches and to engage the clutch upon the compressed air side of the engine and to operate that side by cutting out the  
5 motor.

From the foregoing it will be obvious that a traction engine made in accordance with my invention can be used either as an electrically operated engine or a compressed air  
10 engine, and that for operation around mines an engine of this character is very desirable.

Having thus described the invention, what is claimed as new, is:—

A duplex traction engine comprising a  
15 frame mounted upon traction wheels, an

electric motor, a compressed air engine supported upon the frame, an air compressor comprising cylinders, jackets surrounding said cylinders and spaced therefrom to form cooling chambers, exhaust pipes leading  
20 from the compressed air engine to said cooling chambers, and means for operating the traction engine by the electric motor or by the compressed air engine.

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

JENKIN P. DAVIS.

Witnesses:

W. C. HALL,

J. F. BEAVERS.