No. 709,832. Patented Sept. 23, 1902.

W. J. STEVENS.

AIR COMPRESSOR.

Application filed Jan. 3, 1902.

(No Model.) 2 Sheets—Sheet 1.

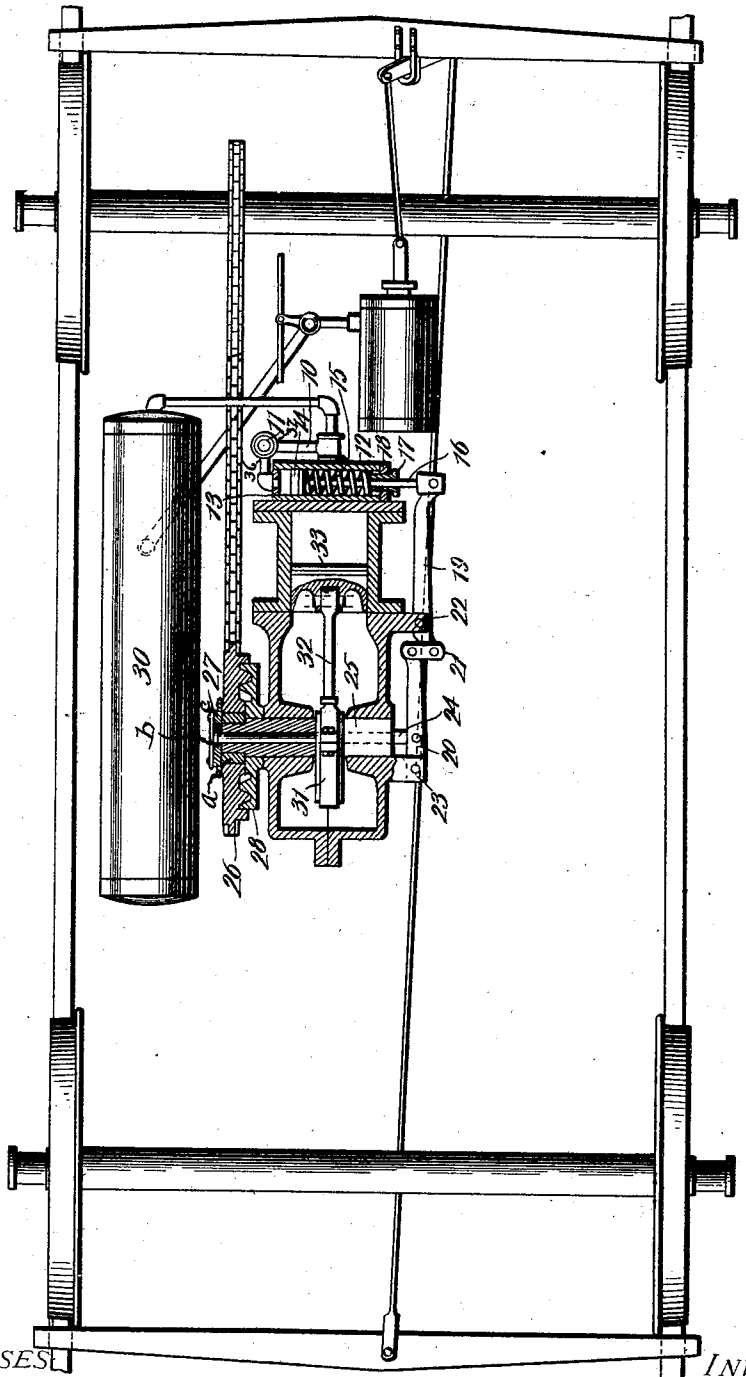


Fig. 1.

WITNESSES:

W. W. Wilkes,

Frank E. Rapp

INVENTOR

Willie J. Stevens

BY Francis. appleman

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 709,832. Patented Sept. 23, 1902.

W. J. STEVENS.

AIR COMPRESSOR.

(Application filed Jan. 3, 1902.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

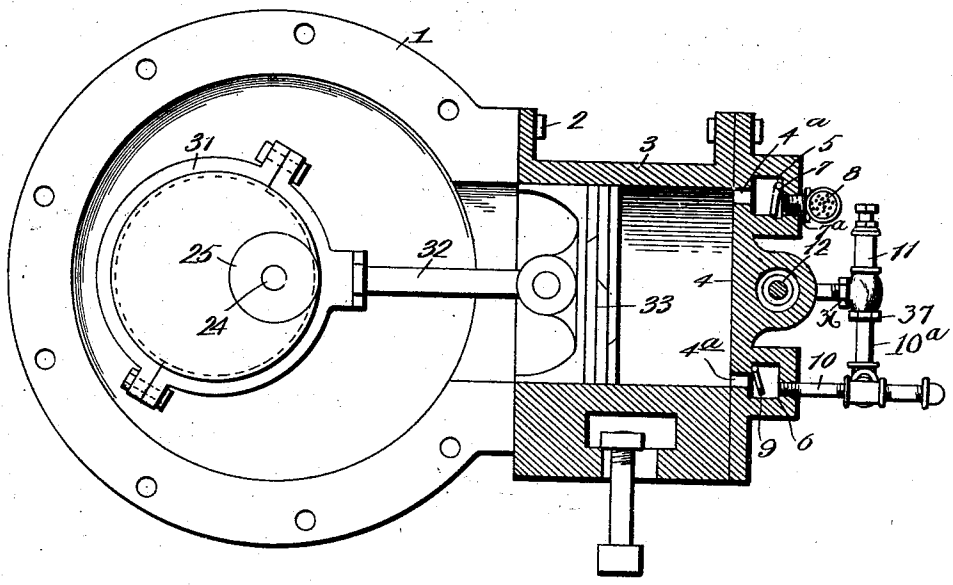
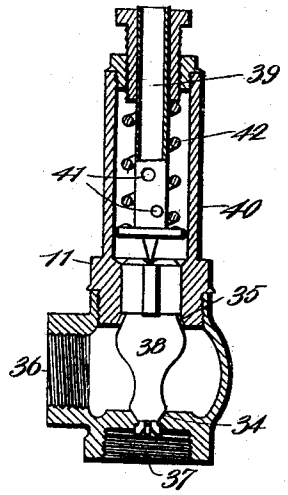


Fig. 3.



WITNESSES:

C. H. Walker

Frank E. Rapp

INVENTOR

Willis J. Stevens

BY Frank A. Appleman

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIE J. STEVENS, OF SKOWHEGAN, MAINE, ASSIGNOR TO THE STEVENS AIR BRAKE COMPANY, OF SKOWHEGAN, MAINE, A CORPORATION.

AIR-COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 709,832, dated September 23, 1902.

Application filed January 3, 1902. Serial No. 38,307. (No model.)

To all whom it may concern:

Be it known that I, WILLIE J. STEVENS, a citizen of the United States of America, residing at Skowhegan, in the county of Somerset and State of Maine, have invented certain new and useful Improvements in Air-Compressors, of which the following is a specification.

This invention relates to air-compressors, and more particularly to that class for use in connection with air-brakes.

The objects of the invention are, first, to produce a compressor which is operated from the axle of a car and in which clutch mechanism is automatically actuated in a novel manner; second, to produce a compressor-cylinder and mechanism acting in combination therewith to compress air and novel means for controlling the pressure in a receiving-tank; third, to produce an apparatus in which the parts are compactly positioned and in which a minimum piping system is employed.

Finally, the object of the invention is to produce a compressor and its operating parts and connections which will possess advantages in points of efficiency and durability, proving at the same time comparatively inexpensive of manufacture.

With the foregoing and other objects in view the invention consists in the details of construction and in the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

In describing the invention in detail reference will be had to the accompanying drawings, forming part of this specification, wherein like characters denote corresponding parts in the several views, and in which—

Figure 1 is a horizontal sectional view of a compressor and the parts coöperating therewith with the connections in plan. Fig. 2 is a vertical sectional view of compressor and the attachment. Fig. 3 is an enlarged sectional view of the valve.

In the drawings, 1 indicates a casing or frame to which is secured by the bolts 2 a compressor-cylinder 3. The head 4 of the cylinder has ports 4^a, guarded by chambers 5 and 6, the former incasing a suction-valve 7, which controls an air-inlet 7^a, said inlet being in communication with the strainer 8. The chamber 6 incases the discharge-valve 9 for the port 4, and pipes 10 10^a lead from the chamber 6 to the valve 11, the detail construction of which will be hereinafter explained. One branch of the valve is in communication with the cylinder 12 through its head 13. A piston 14 is held normally toward the head 13 by the spring 15 encircling the piston-rod 16. The tension of the spring may be varied by the nut 17 threaded in the head 18. A lever 19 is pivoted to the outer end of the piston-rod and has its opposite end connected to a lever 20 through the medium of a link 21. The lever 19 is pivoted intermediately its length to a stud 22 from the frame 1, and the rear end of lever 20 is pivoted to a lug 23 of said frame, while intermediately the lever 20 is pivoted to a pin 24, which is slidable in a hollow shaft 25, said shaft being mounted in bearings of the frame. A bushing *a* is mounted on a reduced portion of the shaft, and a sprocket-wheel 26 runs loose thereon. A ring 27 is secured to the sprocket-wheel and has a central hole for the reception of the pin 24 and a shoulder *b*, engaging the head of the pin. The retaining-plate *c* is secured to the ring 27 to engage the head of the pin in order that the outward thrust of said pin may be communicated to the sprocket-wheel. The sprocket-wheel 26 forms one member of a clutch coacting with another member 28, which is fast on the hollow shaft 25. Hence when the clutch members are in engagement motion of the member 26 is communicated to the hollow shaft. The sprocket-wheel is driven by sprocket-chain in communication with a car-axle, which arrangement being of ordinary construction need not be described in detail. One end of the pin bears against a plate *c*, which is secured to the ring 27, so that as the pin is reciprocated in the hollow shaft the outer clutch member is moved with relation to the other clutch member and throws the parts into action or disconnects them according to the direction of movement.

From the foregoing description it will be observed that the air compressed in the cylinder is conveyed to the reservoir 30^a until the pressure in said reservoir reaches the pressure required to open the valve 11. As soon

as said valve is open communication with the fluid is established to the cylinder 12, which results in forcing the end of lever 19 outward and the lever 20 inward, thereby moving the pin 24 inwardly and carrying the clutch member 26 away from the member 28 and stopping the rotation of shaft 25. An eccentric 30 is carried by the shaft 25, and eccentric-straps therearound are connected to the piston-rod 32 of the piston 33. As soon as the pressure in the reservoir decreases to the tension of the safety-valve the pressure to the cylinder 12 is removed by the seating of the valve, and the spring 15 forces the piston toward the head 13 and swings the levers 19 and 20 on their pivots, causing the pin to carry the clutch member into engagement and the operating mechanism of the compressor is caused to act. The air from the reservoir may be used in any desired manner and with any suitable break system.

The valve comprises in its construction a casing having valve-seats 34 and 35, said casing having branches 36 and 37, connected with the regulating-cylinder and air-supply, respectively, a double valve 38, acting alternatingly with the valve-seats 34 and 35, and a tube 39, slidable in a branch 40 of the casing, said tube having ports 41, leading from the branch 40 to the atmosphere. The lower end of the tube bears against the upper end of the valve, and when the pressure on the valve does not overcome the tension of the spring 42 it remains seated at 34; but when the pressure overcomes the tension of the spring 42 the valve is lifted to the seat 35 and the air is permitted to enter the cylinder 12, as heretofore described. The valve 38 is lifted when the pressure in the reservoir overcomes the tension of the spring 42. When the valve 38 descends, which occurs when the pressure is less than the tension of the spring, passage of air is permitted between the valve and the valve-seat 35, and the air forced from the cylinder 12 by the return of its piston escapes through the valve 38 and by way of the ports 41 and tube 39 to the atmosphere.

Having fully described the invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a compressor, the combination of cylinder, a piston therein, a hollow shaft suitably mounted, a clutch member on the hollow shaft, a pin slidable in the hollow shaft, a second clutch member moved by the pin into engagement with the clutch member on the hollow shaft, an eccentric on the hollow shaft, a piston-rod and eccentric-strap, a controlling-cylinder on the cylinder-head of the first-named cylinder, a piston therein, a spring engaging the piston, a reservoir, a valve between the reservoir and controlling-cylinder, a piston-rod extending through one head of the controlling-cylinder, and levers connecting the piston-rod and pin, as and for the purpose described.

2. In a compressor, a cylinder, a piston therein, a hollow shaft suitably supported, an eccentric on the shaft, a connection between the eccentric and piston, a clutch member on the shaft, a pin in the shaft, a clutch member carried by the pin, means for turning the last-named clutch member, a lever pivoted to a stud of a frame and to the pin, a second lever pivoted to a stud, a link connecting the levers, a controlling-cylinder, a piston and piston-rod therein, the last-named lever being pivoted to the piston-rod, a spring in the controlling-cylinder holding the piston back, a reservoir and connections whereby excess pressure in the reservoir moves the piston against the spring in the controlling-cylinder as and for the purpose described.

In testimony whereof I affix my signature, in the presence of two witnesses, this 23d day of December, 1901.

WILLIE J. STEVENS.

Witnesses:
ERNEST C. BUTLER,
A. K. BUTLER.