

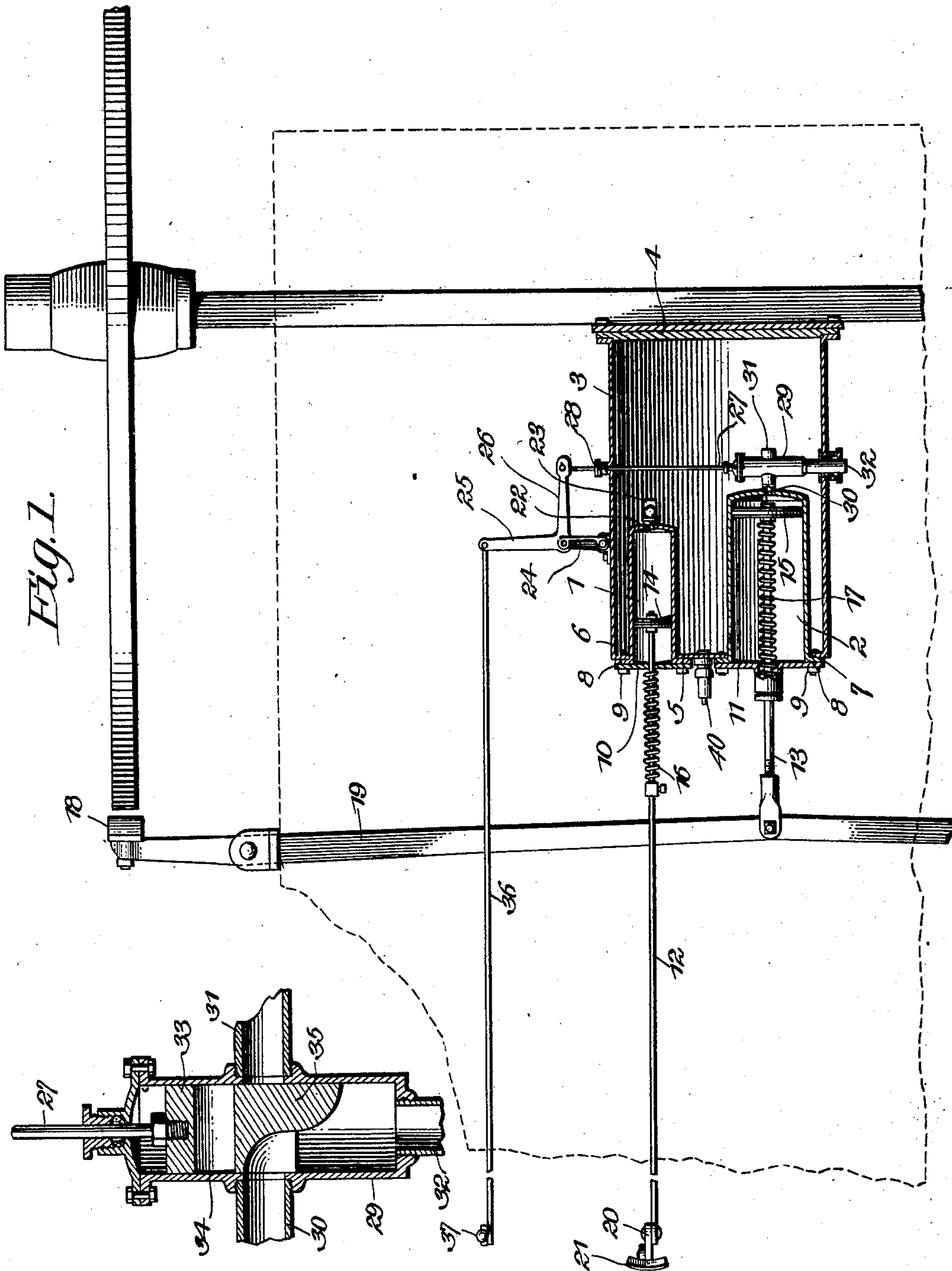
No. 732,789.

PATENTED JULY 7, 1903.

J. S. SMART.
AIR BRAKE FOR VEHICLES.
APPLICATION FILED MAR. 14, 1903.

NO MODEL.

2 SHEETS--SHEET 1.



Witnesses

Witnesses
E. H. Stewart
Wm. Bagger

Fig. 3.

Joseph S. Smart, Inventor:
by *Chas. Snow*
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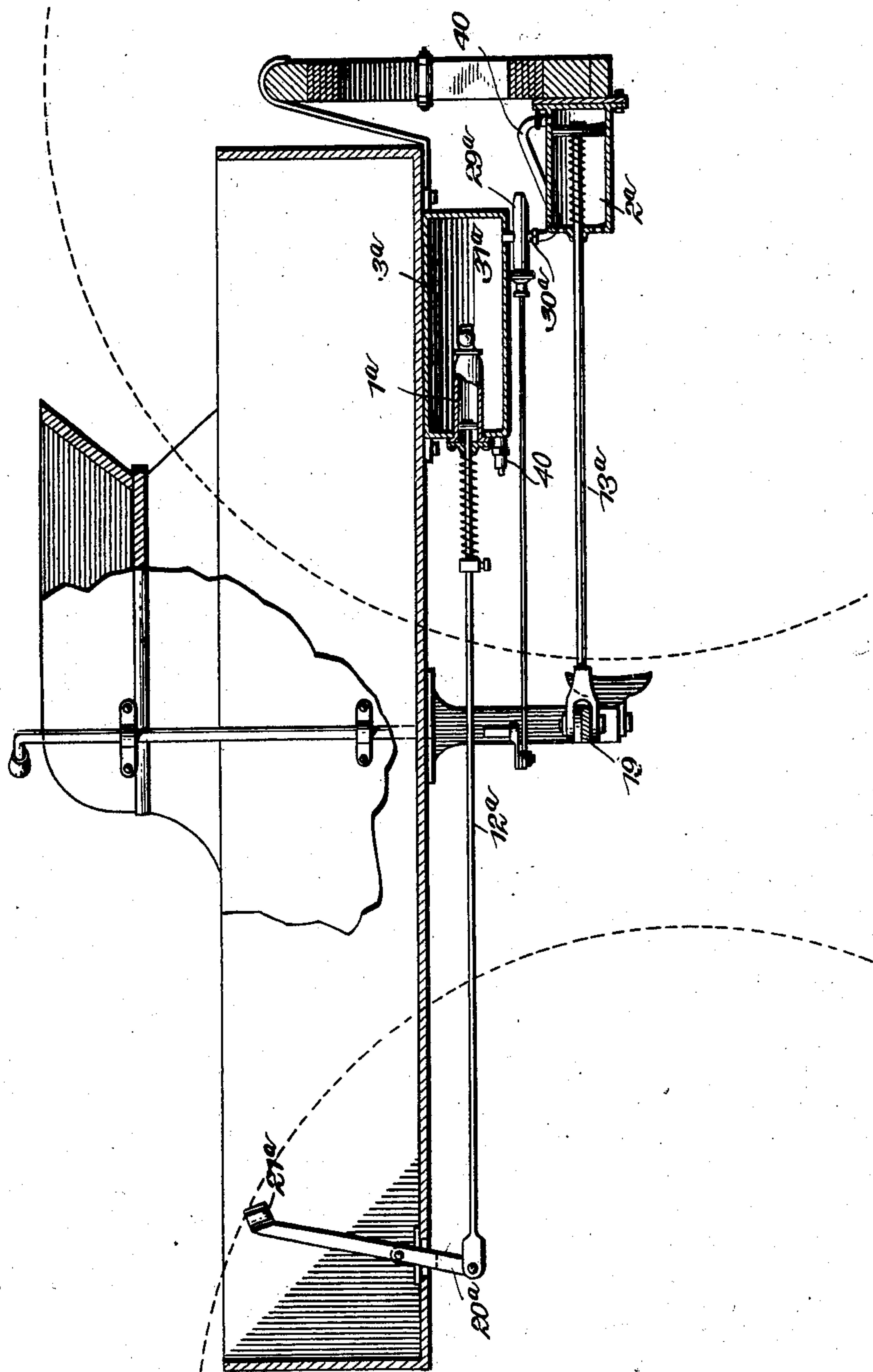
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Fig. 2.



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Attorneys

UNITED STATES PATENT OFFICE.

JOSEPH S. SMART, OF WAIT, MICHIGAN, ASSIGNOR OF ONE-HALF TO
JAMES PERKINS, OF WAIT, MICHIGAN.

AIR-BRAKE FOR VEHICLES.

SPECIFICATION forming part of Letters Patent No. 732,789, dated July 7, 1903.

Application filed March 14, 1903. Serial No. 147,822. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH S. SMART, a citizen of the United States, residing at Wait, in the county of Lapeer and State of Michigan, have invented a new and useful Air-Brake for Vehicles, of which the following is a specification.

This invention relates to air-brakes for vehicles; and it has for its object to provide a device of this class which shall be capable of being applied to vehicles of ordinary construction, whether the bodies of such vehicles be supported upon springs or otherwise, the principal purpose of my invention being to provide a pneumatic device comprising a storage-chamber, an air-pump, a brake-cylinder, and connections between the latter and the brake-rods whereby the latter by simply releasing a valve may be made instantly effective to operate the brake.

With these and other ends in view the invention consists in the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view, partly in section, showing my improved air-brake apparatus applied to the running-gear of an ordinary wagon. Fig. 2 is a sectional elevation showing my invention applied to a spring-vehicle. Fig. 3 is a detail sectional view of the valve mechanism of my improved air-brake apparatus.

Corresponding parts in the several figures are indicated by similar numerals of reference.

In the preferred form of my invention, and especially when the latter is used in connection with springless wagons, the parts of my invention constituting the air-pump and the brake-cylinder, which are designated, respectively, 1 and 2, are preferably disposed within the air reservoir or tank 3. The latter is preferably of cylindrical form and is provided at its rear end with a solid head 4 and at its front end with a head 5, having openings 6 and 7, in which are fitted the cylinders of the air-pump 1 and brake-cylinder 2, said cylinders

being flanged at their outer ends, as shown at 8, and secured to the head 5 by means of bolts, as will be readily understood, the same bolts 9 serving to secure in position the heads 10 and 11 of the pump and brake-cylinder. These heads are provided with central openings having packing-glands, through which extend the pump-rod 12 and the brake-rod 13, which are equipped with pistons 14 and 15. The compression-spring 16, coiled upon the pump-rod, serves to force the latter normally in an outward direction, while a similar spring 17, coiled upon the brake-rod within the brake-cylinder, serves to force the piston 15 normally in an inward direction in said cylinder, consequently releasing the brakes, which latter comprise shoes 18, mounted upon the levers 19, which have suitable pivotal connection with the brake-rod 13, said brake-levers being fulcrumed under the wagon-box or to the running-gear of the vehicle in any convenient manner.

The pump-rod 12 is carried forward under the wagon-box and is suitably connected with the lower end of a lever 20, having at its upper end a treadle 21, which is convenient to the driver, who by manipulating said lever may operate the pump to force air into the tank through an opening 22 at the rear end of the pump-cylinder, in which is seated a check-valve 23.

One side of the air-tank is provided with a link 24, to which is pivotally connected a crank-lever 25, having a laterally-extending arm 26, which has pivotal connection with the outer end of the valve-stem 27, which extends through a packing-box 28 in the side of the air-tank. 29 is a valve-chamber, which in this instance is secured to the inner end of the brake-cylinder, with which it communicates through a port 30. An oppositely-disposed port 31 communicates with the interior of the air-tank, and an additional port or exit 32 connects the valve-chamber with the outer atmosphere. The valve, which is designated 33, comprises a cylindrical body having a transverse perforation 34, adapted to connect the ports 30 and 31, and a longi-

tudinal extension 35, which when the valve is withdrawn serves to close the port 31, that communicates with the interior of the air-tank, while the port 30 from the interior of the
5 brake-cylinder will be opened to atmosphere. The valve 33 is mounted upon the rod 27, whereby it is operated.

The outer end of the lever 25 is pivotally connected with an operating-rod 36, which
10 extends forwardly and is properly connected with a lever 37, suitably disposed within reach of the driver, who by manipulating said lever may operate the valve at any time.

When my invention is applied to spring-
15 vehicles, as in Fig. 2 of the drawings, a change in construction is necessary. In this case the air-tank, here designated 3^a, is mounted upon the vehicle box or body, to the under side of which it is preferably secured,
20 and the air-pump, here designated 1^a, is disposed within said air-chamber, the pump-rod 12^a being properly extended and connected with a foot-lever 20^a, having a treadle 21^a. The brake-cylinder 2^a is in this instance con-
25 nected independently with the running-gear—for instance, with the rear axle—as shown in Fig. 2 of the drawings, the front end of the piston-rod 13^a having pivotal connection with the brake-levers. The valve-
30 chamber 29^a is in this instance connected with the air-chamber, with which it communicates through the port 31^a. The port 30^a commu-
35 nicates, by means of a rubber hose 40, with the rear end of the brake-cylinder. This hose 40 forms a flexible connection between the pump and air-tank, which must be con-
40 nected with the vehicle box or body in order to enable the pump to be operated, and the brake-cylinder, which must be connected
45 with the running-gear in order that the brake mechanism may be properly operated. The valve structure and the *modus operandi* are the same in either case.

The operation of my invention will be
45 readily understood from the foregoing description, taken in connection with the drawings hereto annexed. When the driver is seated, he will operate the foot-lever so as to actuate the pump and compress the air with-
50 in the chamber or reservoir 3 or 3^a, which in either case is provided with a safety-valve (indicated at 40) in order to avoid an excess of pressure. The pressure may be main-
55 tained by an occasional stroke of the pump, while the brake may be operated at any time by simply operating the valve so as to permit air to pass from the air-chamber to the rear end of the cylinder, where it will expand and force the piston in a forward direction,
60 thus setting the brakes with a degree of pressure which may be easily regulated by the extent to which the valve is operated. To release the brakes, the valve is reversed, thus permitting the air contained in the brake-
65 cylinder to escape to atmosphere.

By my improved braking device the brakes

may be set at any time when going uphill, so as to temporarily relieve the horses of the load, or it may be set when going downhill in order to check the progress of the vehicle. In the
75 event of a runaway a heavy pressure may be suddenly exerted by operating the brake to its full capacity, thereby serving to check the progress of the horses. Under the latter cir-
80 cumstances the driver will be relieved of any duty except that of merely throwing the
85 brake-lever, and he may thus devote his entire attention to the management of the animals.

I have in the foregoing described simple
80 and preferred forms of my invention; but I desire it to be understood that I do not limit myself to the precise structural details herein described, but reserve the right to any
85 changes, alterations, and modifications which may be resorted to within the spirit and scope of my invention and without sacrificing the utility of the same.

Having thus described my invention, I
90 claim—

1. In an air-brake for vehicles, an air-chamber, an air-pump disposed within and opening into said air-chamber, a pump-rod, a foot-lever having a treadle at its upper end connected at its lower end with said pump-rod,
95 and a spring normally forcing said pump-rod in an outward direction.

2. In an air-brake for vehicles, an air-tank, an air-pump and a brake-cylinder disposed within said air-tank and attached to the head
100 of the same, said air-pump having an opening connected with the tank and a check-valve seated in said opening, a valve-casing having ports connected with the brake-cylinder, with the interior of the air-tank and with
105 atmosphere, a valve seated in said chamber and adapted to connect the brake-cylinder with the interior of the air-tank and with atmosphere, and means for operating said valve.

3. In an air-brake for vehicles, the combination of an air-chamber, a pump disposed within said chamber and adapted to compress air therein, treadle means for operating said
110 pump, a brake-cylinder having a piston and a stem, brake-levers having pivotal connection with said stem, a valve-chamber having ports communicating with the air-chamber, with the rear end of the brake-cylinder and with atmosphere, a valve slidable in said
115 valve-chamber and having a transverse opening registrable with the ports to the air-tank and to the brake-cylinder and a longitudinal extension adapted to cut off the supply from the air-chamber and to open the brake-cylinder to atmosphere, and means for operating
120 said valve.

4. In a device of the class described, a cylindrical valve-chamber having oppositely-disposed ports to a compressed-air supply and to a brake-cylinder and an exit to atmosphere at one end, a cylindrical valve slidable
125 in said chamber and having a transverse per-

foration registrable with the oppositely-dis-
posed ports in the valve-chamber and a lon-
gitudinal extension adapted, when the valve
is withdrawn, to close the port of the com-
5 pressed-air supply and to establish commu-
nication between the brake-cylinder and at-
mosphere, and means for operating said valve.

In testimony that I claim the foregoing as
my own I have hereto affixed my signature in
the presence of two witnesses.

JOSEPH S. SMART.

Witnesses:

A. B. MARKHAM,
M. J. GARNSEY.