

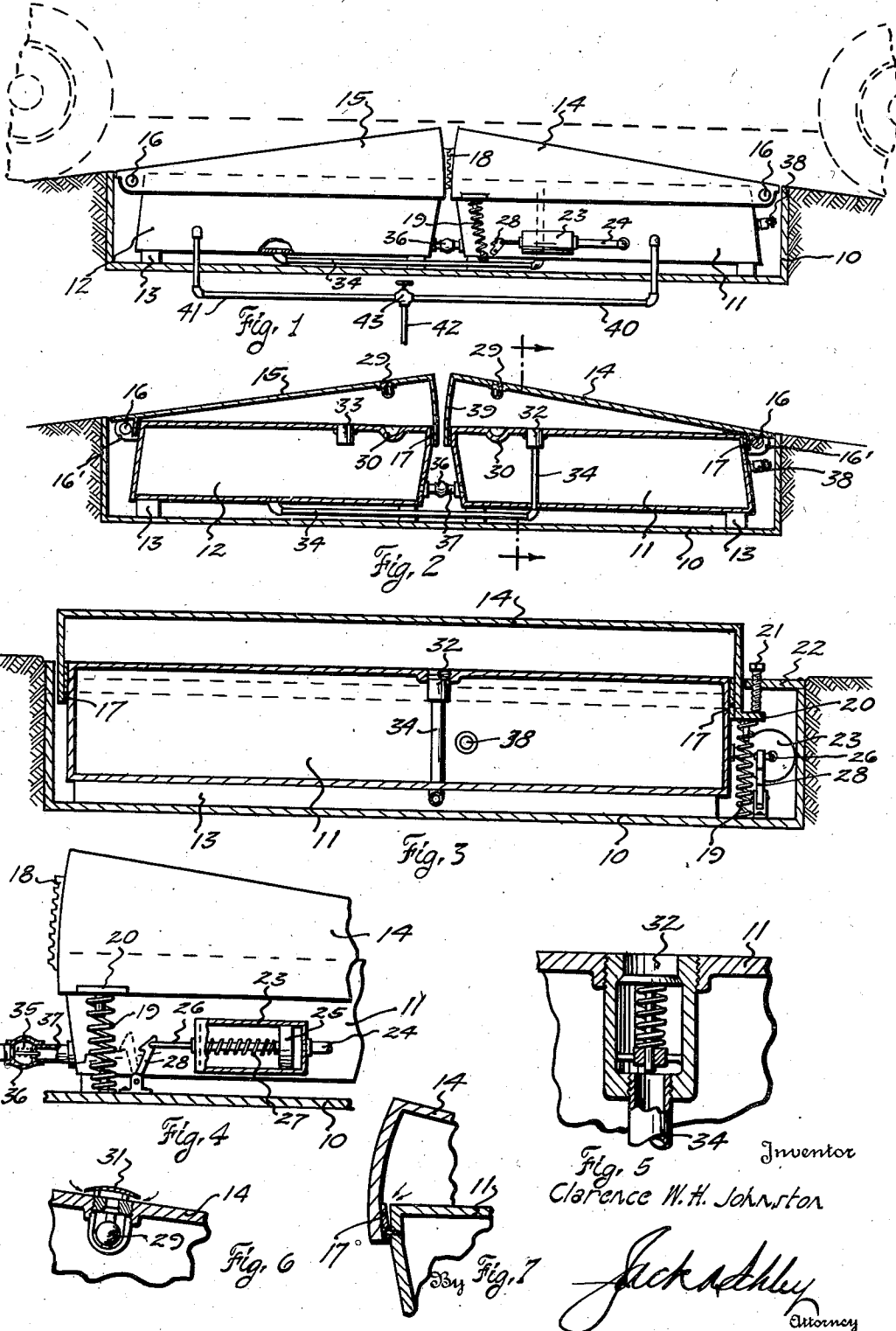
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AIR COMPRESSOR

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AIR COMPRESSOR

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6 Claims. (Cl. 230—216)

This invention relates to new and useful improvements in air compressors.

One object of the invention is to provide an improved air compressor which is arranged to be operated by the passage of vehicles thereover.

Another object of the invention is to provide an improved air compressor which is located in the path of vehicles, whereby said vehicles will operate the compressor to compress and store air.

A particular object of the invention is to provide an air compressor including a pivoted treadle on its upper surface coacting with a stationary member to compress air therebetween upon depression of said treadle.

A further object of the invention is to provide means for automatically locking the compressor against operation when the air in the storage tank reaches a predetermined pressure.

Another object of the invention is to provide an air compressor having a pair of tanks embedded in the ground and pivoted treadles arranged thereabove to coact with the tanks to compress air therebetween; the tanks thereby being out of the way and the treadles projecting slightly above the ground in order that the vehicles passing thereover will depress said treadles and compress the air between said treadles and the tanks.

A still further object of the invention is to provide an air compressor having two tanks each of which is provided with a pivoted treadle coacting therewith to compress air, the tanks being arranged so that the air compressed by both treadles will first be introduced into one of the tanks and when the pressure in this tank reaches a predetermined point, then air is permitted to enter the second tank.

A construction designed to carry out the invention will be hereinafter described, together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawing, in which an example of the invention is shown, and wherein:

Figure 1 is an end view partly in elevation and partly in section of an air compressor constructed in accordance with the invention,

Figure 2 is a transverse vertical sectional view of the air compressor,

Figure 3 is a longitudinal vertical sectional view taken on the line 3—3 of Figure 2,

Figure 4 is a detail of the latching means, partly in elevation and partly in section,

Figure 5 is an enlarged sectional view of one of the tank valves,

Figure 6 is an enlarged sectional view of one of the treadle valves, and,

Figure 7 is an enlarged sectional view of the front portion of one of the compressors showing the air seal between the treadle and the tank.

In the drawing the numeral 10 designates a rectangular shallow casing which is embedded in the drive-way of a service station or any other place along which vehicles travel where it may be desired to use the device. The top of the casing is open and is flush with the drive. The drive may be inclined so as to provide an approach for the device and also to prevent water flowing into the casing. The casing may be provided with a suitable drain trap (not shown). A pair of compressors consisting of rectangular storage tanks 11 and 12 are disposed transversely in the casing. These tanks are set on blocks or cross members 13 in the casing and are suitably secured therein.

Each tank is provided with an air compressing member or treadle 14 and 15, each of which is pivoted on a longitudinal shaft 16. These shafts are journaled in ears 16' which are mounted on the rear of the tanks. It is noted in Figures 2 and 3, that the treadles are provided with depending marginal flanges or aprons 39 which surround the upper portion of the tanks when the treadles are in an elevated position. The treadles are also provided with oppositely inclined treads which cover the top of the tanks. A suitable packing ring 17 is mounted along the upper edge of the tank. This ring is fastened at its lower edge to the tank in such a manner that its upper edge is free to be displaced against the depending apron of the treadle. Attention is called to Figure 7, wherein it is seen that the air will exert its pressure behind the ring at its top and force the same against the apron to effectively form an air-tight seal.

Gear racks 18 are disposed on the adjacent aprons of the treadles so that they mesh with each other, whereby the two treadles move as a unit. The treadle 14 is provided with a suitable coiled spring 19 to hold said treadle in an elevated position. The upper end of the spring engages under a lug 20 which extends outwardly at one side from the bottom of the apron 39 of the treadle 14. The upward movement of the treadles is limited by the lug engaging the lower end of a bolt 21 which is threaded through a plate extending inwardly from the top of the casing.

A cylinder 23 is disposed along one side of the

tank 11 near its bottom, and is connected at one end to the tank by a pipe 24. A piston 25 is mounted to reciprocate in the cylinder and has its rod 26 extending through the front end of said cylinder. A coiled spring 27 surrounds the rod and is confined between the front end of the cylinder and the piston. The forward end of the rod 26 is connected to a pivoted latch 28, whereby reciprocation of the piston will swing said latch.

The tops of the treadles are provided with air inlet check valves 29 preferably of the ball type but any valve suitable for the purpose may be used. A sump 30 is provided in the top of the tank for receiving the valve when the treadle is in its lowered position. In Figure 6, I have shown a cap 31 which may be mounted above the valves if so desired. The caps prevent dirt and other extraneous matter entering the treadles and interfering with the operation thereof.

The tanks are provided with suitable air inlet check valves 32 and 33 mounted in their tops. The valves shown are of the plunger type but any valve suitable for the purpose may be used.

Attention is called to Figure 2 wherein it is noted that the valve 33 opens directly into the tank 12. The valve 32 is also connected by a pipe 34 to the tank 12. Thus it is seen that all the air trapped and compressed between the treadle members 14 and 15 and the top of the tanks, will be delivered to the tank 12. When this tank is filled and the air is compressed to a predetermined pressure, the tension of the spring 35 of a check valve 36 is overcome and the compressed air is allowed to pass through a pipe 37 connecting the two tanks, into the tank 11.

Now upon each successive operation of the treadles, the air will enter the tank 12 and after reaching a certain pressure, will then pass into the tank 11; after the air in the tank 11 reaches a predetermined pressure the tension of the spring 27 in the cylinder is overcome. This forces the piston 25 to the forward end of the cylinder 23 and the latch 28 is swung into the path of the lug 20. Upon the next down stroke of the treadles the latch will engage the lug and prevent upward movement of the treadles. In case too high a pressure is built up in the tank 11, a safety valve 38 is provided in its rear side.

Outlet pipes 40 and 41 lead from the tanks 11 and 12 respectively and connect to a main air supply line 42. A two way valve 43 of the usual type is connected at the intersection of the pipes 40 and 41 and the line 42, whereby the passage of air from either pipe to said line is controlled.

When the pressure in the tank 11 has been lowered sufficiently, the spring 27 will return the piston 25 to the rear end of the cylinder 23 and the latch will be disengaged from the lug 20, whereby the treadles will again rise to their elevated position and be ready for operation. It is to be understood that the invention is not limited to two compressors or two tanks, as the device may be used very satisfactorily with one tank, either extending the width of the two tanks or being very much smaller. Neither do the tanks have to be located directly under the treadles as said treadles could co-act with any stationary members, the valves in said members having connection with the tanks, which may be at any desired point.

The operation of the device is as follows. When the treadles are in their elevated position

as shown in Figure 1, and the front wheels of a vehicle pass thereover, the weight of the said vehicle will depress the treadles. This depression will force air that is trapped between the treadles and the top of the tanks through valves 32 and 33. The air that passes through the valve 33 is admitted directly into the tank 12, while the air that passes through the valve 32 is led by a pipe 34 into the same tank 12. The idea is that the tank 12 will be filled first and the air compressed therein until a sufficient predetermined pressure is reached. This depression also compresses a coil spring 19 and when the front wheels have passed over and off the treadles the same is forced upwardly due to the action of the said spring. The tread of the treadles are provided with air inlet valves 29 in order that air will be admitted beneath the treadle into the treadles on the upstroke. The coil spring 19 returns the treadles to their elevated positions rather quickly. When the back wheels of the vehicle pass onto the treadles the same action is repeated as has been described for the front wheels.

After sufficient operation, the pre-determined pressure is reached in the tank 12. This pressure will then operate the valve 36 and air is then admitted to the tank 11. The tank 11 will then be filled upon a continued operation of the treadles and when a predetermined pressure is reached, this air pressure will force the piston 25 forwardly under tension of the spring whereby the latch 28 is swung into the path of the lug 20 on the treadle 14. Upon the next downward movement of the treadles the latch will engage said lug and prevent the rise of said treadles.

The valve 43 controls the air entering the main supply line 42 from either of the pipes 40 and 41. It is obvious that the valve may if desired be entirely closed off. The device is simple in construction and depends only on the vehicles passing thereover for operation. It is again pointed out that the invention is not to be limited to two tanks, as efficient operation may be had with a single tank.

The description which has been given recites more or less detail of a particular embodiment of the invention, which is set forth as new and useful; however, I desire it understood that the invention is not limited to such exact details of construction, because it is manifest that changes and modifications may be made, within the scope of the appended claims, without departing from the spirit of the invention.

What I claim and desire to secure by Letters Patent, is:

1. An air compressor comprising, a tank, a treadle arranged to be operated by vehicles passing thereover and coacting with said tank to compress air therebetween, means for admitting air between said treadle and tank, the tank constituting a storage chamber for the compressed air, and means for conducting the compressed air from between said treadle and tank to the tank.

2. An air compressor comprising, a tank, a treadle arranged to be operated by vehicles passing thereover and coacting with said tank to compress air therebetween, means for admitting air between said treadle and tank, the tank constituting a storage chamber for the compressed air, and means for conducting the compressed air from between said treadle and tank to the tank.

to the tank, and means for locking said treadle in an inoperative position.

5 3. An air compressor comprising, a tank, a treadle arranged to be operated by vehicles passing thereover and coacting with said tank to compress air therebetween, check valves in the treadle for admitting air between said treadle and tank, the tank comprising a storage chamber for the compressed air, and valves in the tank
10 arranged to be operated by compressed air admitting the compressed air from between said treadle and tanks to the tank.

15 4. An air compressor comprising, a pair of storage tanks, a treadle coacting with each tank to compress air therebetween and arranged to be operated by vehicles passing thereover, check valves for admitting air between between each treadle and tank, means for conducting the air compressed by both treadles to one of the tanks, and a closed connection between the tanks arranged to be opened when the air in the first tank reaches a predetermined pressure, whereby air
20 is then conducted to the second tank.

5. An air compressor comprising, a stationary member, a treadle pivoted to the member and arranged to swing thereover and having an air admitting opening therein, the treadle being arranged to be depressed by vehicles passing thereover, the space between the treadle and member forming an air compressing chamber wherein the air within said chamber is compressed when the treadle is depressed, and a storage chamber for the compressed air. 5

10 6. An air compressor comprising, a stationary member, a treadle pivoted to the member and arranged to swing thereover and having an air admitting opening therein, the treadle being arranged to be depressed by vehicles passing there- 15 over, the space between the treadle and member forming an air compressing chamber wherein the air within said chamber is compressed when the treadle is depressed, a storage chamber for the compressed air, and means for locking said
20 treadle in an inoperative position.

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