

No. 893,868.

PATENTED JULY 21, 1908.

G. B. PICKOP.
VIBRATOR.

APPLICATION FILED FEB. 20, 1905.

Fig. 1.

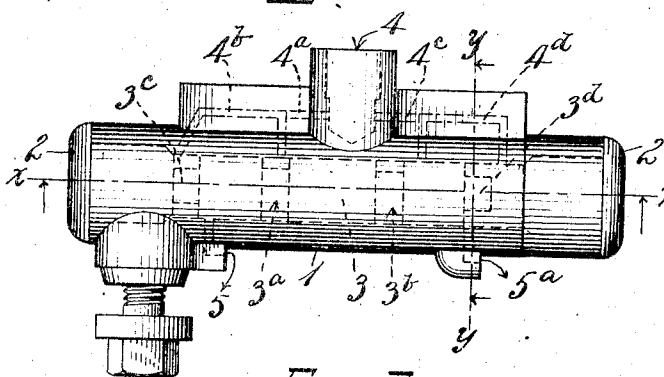


Fig. 4.

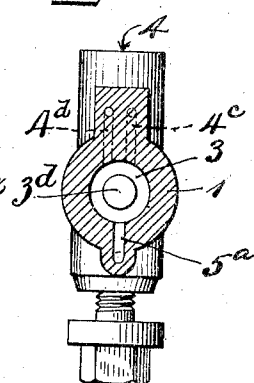


Fig. 2.

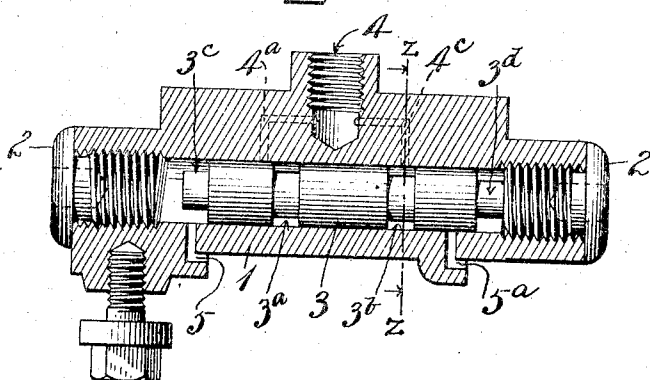


Fig. 5.

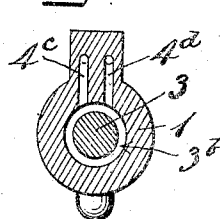
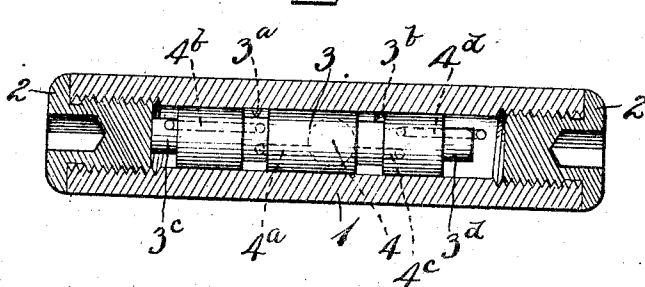


Fig. 3.



Witnesses
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VIBRATOR.

No. 893,868.

Specification of Letters Patent.

Patented July 21, 1908.

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To all whom it may concern:

Be it known that I, GEORGE B. PICKOP, a citizen of the United States, residing at New Britain, county of Hartford, and State of Connecticut, have invented certain new and useful Improvements in Vibrators, of which the following is a full, clear, and exact description.

My invention relates to improvements in vibrators, sometimes called vibrator engines, among the main objects being simplicity, economy of construction, durability, and reliability of action.

In the drawings Figure 1 is a side elevation. Fig. 2 is a longitudinal section. Fig. 3 is a section on the line X—X looking in the direction of the arrows. Fig. 4 is a section on the line Y—Y looking in the direction of the arrows. Fig. 5 is a section on the line Z—Z looking in the direction of the arrows.

In the drawings I have shown and will now proceed to describe the preferable form of my invention.

1 is a cylinder having a plain straight bore therethrough.

2—2 are screw plugs whereby the ends of the cylinder 1 may be closed.

3 is the piston, the diameter of which corresponds to the bore of the cylinder 1.

3^a—3^b are recesses or annular grooves in the piston 3.

3^c—3^d are stops arranged between the ends of the piston and the adjacent inner ends of the plugs 2—2. These stops are of less diameter than the diameter of the piston, and their function is to prevent the ends of the piston from entirely closing the space between the ends of said piston and the stops, when the piston is in either of its extreme positions.

4 is an air admission passage through which compressed air at the desired pressure is supplied to the interior of the cylinder.

5—5^a are exhaust ports. When the piston stands in the position indicated in Figs. 1 and 3 the exhaust port 5^a is open and air will be admitted through the passages 4^a—4^a, through the groove 3^a, and thence through the duct 4^b to that end of the cylinder adjacent to the stop 3^c. The pressure of the air in this end of the cylinder will cause the piston to shift from the position indicated in Figs. 1 and 3 to the position indicated in Fig. 2. This movement of the piston will open

the exhaust port 5 and will close the exhaust port 5^a and the air ducts 4^a—4^b. When the piston is in the position indicated in said Fig. 2, the groove 3^b in the piston will furnish a communication between the ends of the ducts 4^c—4^d, whereby air will then be admitted to that end of the piston adjacent to the stop 3^d. The pressure will then drive the piston back to its original position indicated in Figs. 1 and 3. As the piston thus vibrates back and forth it will impart sharp blows in rapid succession against the inner ends of the plugs 2—2.

I prefer to incline that end of one of the admission ducts, for example 4^b, where it enters the cylinder, for by so doing I find that it causes the piston to impart a slightly stronger blow at one end than at the other, with the result that the piston will stop or come to rest when the air is shut off, at one end of the cylinder rather than in the middle. Hence, when air is turned on again, the piston starts readily. It will be observed that I eliminate entirely the necessity of any spring or other means for starting or maintaining the vibrator in action. I preferably form the cylinder of brass or bronze, and the piston of steel, properly hardened and ground. I find by this arrangement most effective results can be obtained, and that no lubricant whatever is necessary. This is of great advantage, since the use of a lubricant would in a short time impair the free action of the parts, owing to the fact that it would become gummy and retain particles of dust or dirt, the presence of which would tend to bind the piston and prevent its free operation. The apparatus as shown is double acting, although this is not essential. The force of the blows on either or both ends may be modified at will by varying the pressure of the air supply, or by varying the size of the ports. The field of work for such an apparatus is unlimited. The source of power may be compressed air or any other suitable fluid medium. The plugs 2—2 may have squared sockets in their ends, for example as shown in Fig. 1, to permit of the introduction of a wrench whereby said plugs may be readily inserted or removed.

The construction is simple, inexpensive, durable, and effective, and comprises such easily produced parts that it requires but little cost to manufacture or maintain.

What I claim is:

1. In a vibrator engine, a cylinder having an internal bore of uniform diameter, and a duct leading to and piercing one wall of the bore at an oblique angle relative to the end wall, said duct being interrupted intermediate its length and communicating with the bore, a solid piston operable in the bore and having an extension at one end of reduced diameter, and an annular recess and removable plugs for both ends of said cylinder, one plug forming said end wall.

2. In an apparatus of the character described, a cylinder, a duct leading to and piercing one end thereof, another duct communicating with the first, and leading to and piercing the opposite end of said cylinder, one of said ducts piercing the cylinder at an oblique angle relatively to the end wall of the cylinder, both of said ducts being interrupted intermediate their length and each piercing said cylinder at two points in the same transverse plane, a piston, and recesses therein arranged to alternately furnish communica-

tion between the interrupted portions of said ducts. 25

3. In a vibrator engine, a cylinder, an imperforate free piston therein, said piston having two annular grooves intermediate its length, said cylinder having an air admission port and two air transfer passages leading therefrom to opposite ends of the cylinder, each passage being located wholly on one side of said admission port, each passage tapping into the cylinder at three points, two of said points being located in substantially the same transverse plane, the third point being located at or near the adjacent end of the cylinder, said cylinder also having two exhaust passages independent of the transfer passages, and arranged respectively toward the ends of the cylinder, said piston operating as a valve to control all of said passages. 30 35 40

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