

No. 831,615.

PATENTED SEPT. 25, 1906.

F. E. LAMMERT.

DASH POT.

APPLICATION FILED DEC. 6, 1904.

2 SHEETS—SHEET 1.

Fig-1

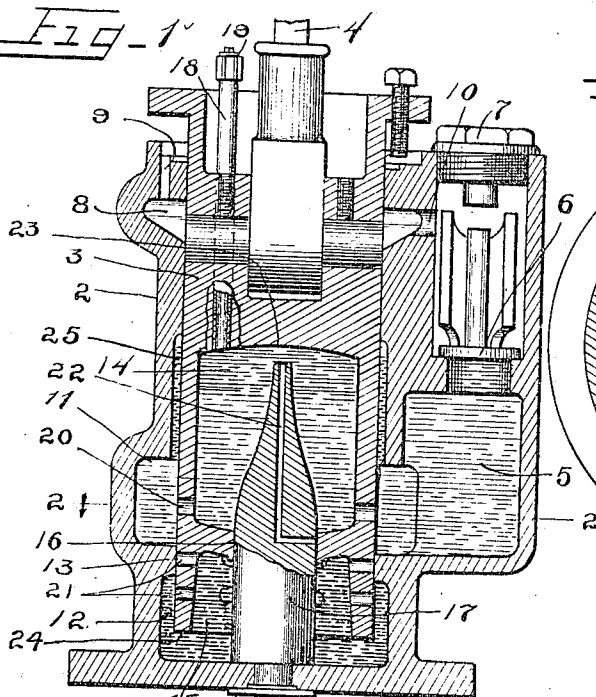


Fig-2

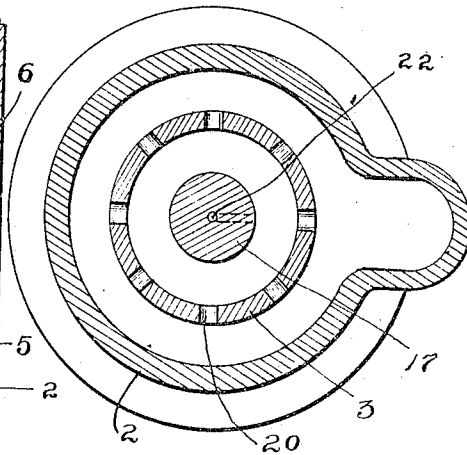


Fig-3

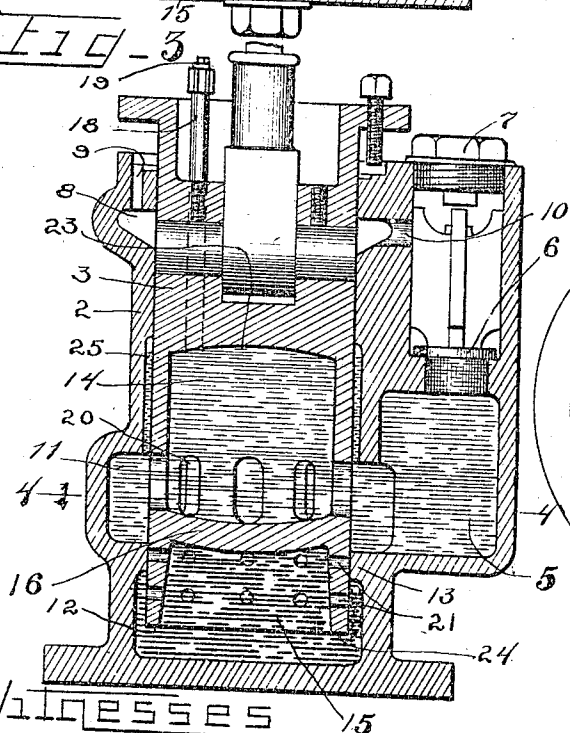
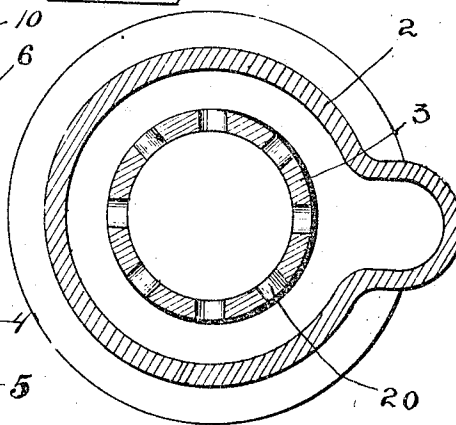


Fig-4



Witnesses

J. H. Angell
J. H. Angell

Inventor

F. E. Lammert
by W. E. Williams ATT.

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2 SHEETS—SHEET 2.

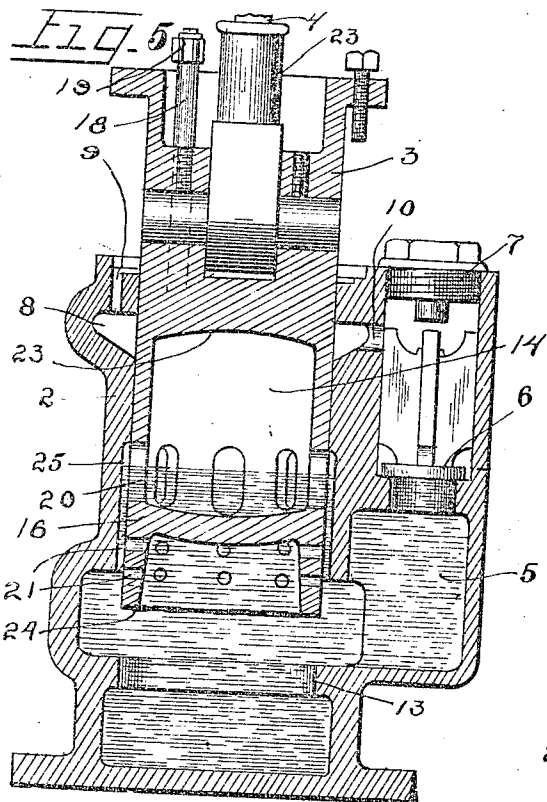


Fig. 6

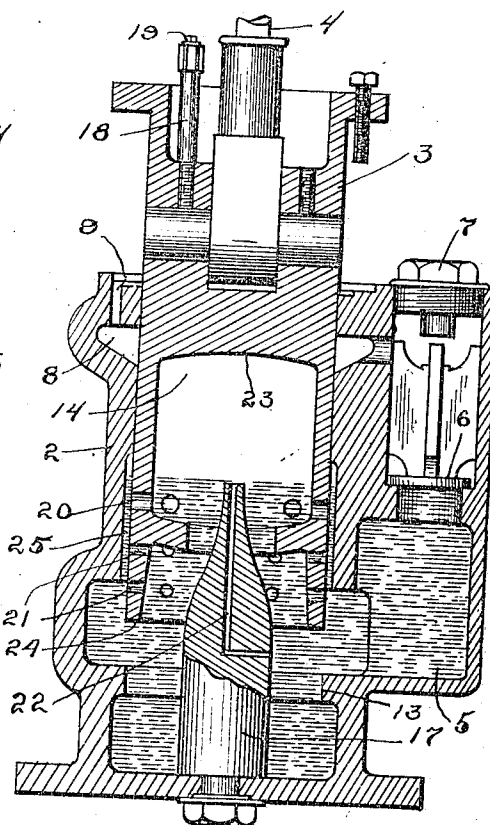
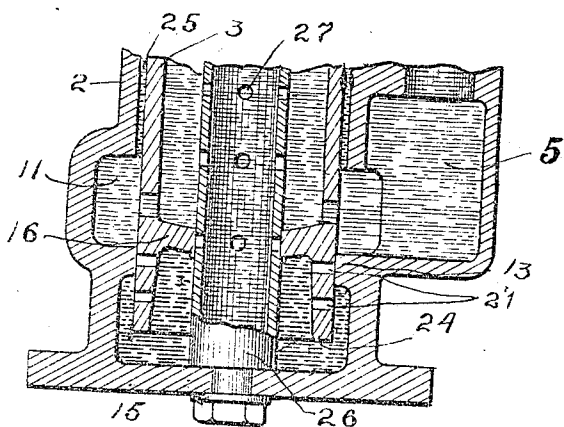


Fig. 7



Witnesses
J. O. Angell
M. A. Shahan

Inventor
F. E. Lammert
by W. E. Williams Atty.

UNITED STATES PATENT OFFICE.

FERDINAND ERNST LAMMERT, OF CHICAGO, ILLINOIS.

DASH-POT.

No. 831,615.

Specification of Letters Patent.

Patented Sept. 25, 1906.

Application filed December 6, 1904. Serial No. 235,777.

To all whom it may concern:

Be it known that I, FERDINAND ERNST LAMMERT, a citizen of the United States of America, and a resident of Chicago, county of Cook, State of Illinois, have invented certain new and useful Improvements in Dash-Pots, of which the following is a specification.

The object of this invention is to produce a dash-pot that shall be free from the hammer-blow of ordinary devices of this class.

In the accompanying drawings, Figure 1 shows my device in vertical axial section, a certain plunger being in depressed position. Fig. 2 is a section on the line 2 2, Fig. 1. Fig. 3 is a view similar to Fig. 1, but showing a slightly different plunger. Fig. 4 is a section on the line 4 4, Fig. 3. Fig. 5 is a view similar to Fig. 3, showing the plunger in raised position. Fig. 6 is a section like Fig. 1, but showing the plunger raised. Fig. 7 is a partial view analogous to Fig. 1, showing a modified construction.

In this apparatus oil or other fluid contained in a suitable cylinder or casing is trapped in the lower part of the cylinder by a descending plunger, but is permitted to escape gradually, as the descent of the plunger continues, in a suitable cavity within the casing, and the parts are so arranged that the cross-sectional area of the escaping body is gradually decreased until at the last instant escape is wholly cut off. When the plunger again ascends, the fluid reënters the space below the plunger and the operation is repeated indefinitely.

In the several figures of the drawings, 2 represents a dash-pot cylinder in which works a plunger 3, connected by a rod 4 to the working parts of an engine or the like. At one side of the cylinder is a chamber 5, communicating with the cylinder and upwardly closed by a check-valve 6, working in a chamber, itself upwardly closed by a screw-plug 7. In the upper portion of the inner wall of the cylinder is an annular recess 8, communicating with the open air by a passage 9 and with the check-valve chamber by a passage 10. The lower portion of the cylinder is provided with an analogous annular recess 11 and at a point still lower with another like recess 12, these two recesses being separated by an intact portion 13 of the cylinder-wall, so that the closely-fitting plunger may when depressed leave no communication between the two recesses. The plunger has in its lower end a downwardly-open re-

cess 15 and above this recess an interior cavity 14, separated from said recess by a wall 16, which is centrally perforated to permit the entrance of a conical or bottle shaped block 17, which is fixed to the bottom of the cylinder. The chamber 14 communicates with the atmosphere by a pipe 18, closed by a check-valve 19, which permits fluid to pass outward, but not inward. Passages 20 lead outward from the cavity 14 through the walls of the plunger, and like passages 21 lead outward in like manner from the cavity 15, these latter passages being in different horizontal planes, as shown. The block 17 is provided with a passage 22, which extends downward from its upper end and then laterally outward at a point such that the opening is reached by the partition between the cavities 14 15 only when the plunger reaches a point near its lower limit of movement. In order that the fluid may pass out through the holes 20 when the plunger is raised, the interior of the cylinder is provided with vertical grooves 25, registering with the openings 20.

In preparing the dash-pot for use all its cavities, including the chamber 5, are filled with oil or the like, and the plunger being then pressed down in the cylinder the surplus oil and air are forced out through the check-valves 6 and 19, the oil which escapes through the check-valve 6 passing through the passages 10 8 9. Some portion evidently remains in the recess 8 and serves as a packing and lubricant for the plunger as the latter reciprocates in the cylinder.

Under normal conditions the oil stands at about the level of the seat of the valve 6 when the plunger is down, and preferably there is no air in the cavity 14 of the plunger. When the depressed plunger is lifted, the atmospheric pressure must be overcome, a vacuum being created below the plunger; but in this vacuum the oil will flow downward under the force of gravity and keep the lower portions of the internal space filled. The oil being thus in the lower part of the cylinder, the plunger as it descends, traps it in the space 12 and compels it to escape upward through the opening for the block 17 and the passages 20, 21, and 22 into the cavity 14 and recess 11. As the plunger continues its descent, these passages are gradually cut off one after the other, and thus the plunger comes to rest without shock, its force being expended in forcing the oil out of the lower part of the cylinder through passages which

are cut off in succession, or as a whole diminished in cross-sectional area or discharging capacity, so that the oil is compelled to pass with greater velocity, and hence with increased resistance. It is to be observed that owing to the very large opening initially left by the block 17, there is never a failure of the oil to fill the lower part of the cylinder while the plunger is raised and there is never a time when the lower surface of the plunger is not in contact with the oil below it, and hence it can never move down to meet the oil with a hammer-blow.

In the form illustrated in Figs. 3, 4, and 5 the bottle-like block is omitted and wall 16 is not provided with the corresponding opening.

In Fig. 7 the projection 17 is replaced by a cylindrical tube 26, provided with numerous lateral perforations 27, the apparatus being in other respects unchanged.

What I claim is—

1. The combination with the cylinder internally enlarged at various heights to form separate annular recesses, of a plunger adapted to trap liquid in the lower portion of the cylinder and itself provided with passages permitting the trapped liquid to gradually escape to a recess above, said passages being arranged to be cut off in succession as the plunger descends.

2. The combination with the cylinder having the internal annular recesses, of the hollow plunger having the recess in its lower face and the perforations in its lateral walls; whereby liquid trapped by the plunger may escape gradually into the recess and plunger-cavity above and may return below the plunger as the latter rises.

3. The combination with a plunger-cylinder, of a plunger having an internal cavity and closely fitting and upwardly closing said cylinder, permanently, against influx to the space below the plunger, a fluid-chamber alongside the lower portion of the cylinder and communicating therewith, and an outwardly-opening check-valve normally closing

a passage from the upper portion of said chamber.

4. The combination with a plunger-cylinder internally enlarged to form near its lower end two recesses at different heights, of a plunger closely fitting the cylinder, having a recess in its lower end face, a central cavity above said recess, a series of lateral perforations at various heights leading into said recess, and lateral perforations leading to said cavity, substantially as set forth.

5. The combination with a plunger-cylinder internally enlarged to form annular recesses at different heights near its lower end and provided with vertical interior grooves leading from the upper recess; of a plunger fitting the interior of the cylinder, having a recess in its end face, a central cavity above said recess, and provided with lateral perforations at different heights leading to said recess, and with other perforations in line with said grooves and leading to said cavity, substantially as set forth.

6. The combination with a plunger-cylinder having an upwardly-tapered central block fixed to its bottom, of a plunger reciprocating in said cylinder, having a central internal chamber, and provided with an opening in its lower wall to receive said tapered block as the plunger descends, whereby the rising of trapped liquid into said cavity is gradually stopped.

7. The combination with a plunger-cylinder provided with a side passage leading to the open air, of a hollow plunger reciprocating in said cylinder and provided with a channel leading from the upper portion of its interior, an outwardly-opening valve controlling said channel, and an outwardly-opening valve controlling said passage, substantially as set forth.

Signed at Chicago this 2d day of December, 1904.

FERDINAND ERNST LAMBERT.

Witnesses:

W. A. SHEAHAN,
C. W. MARSHALL.