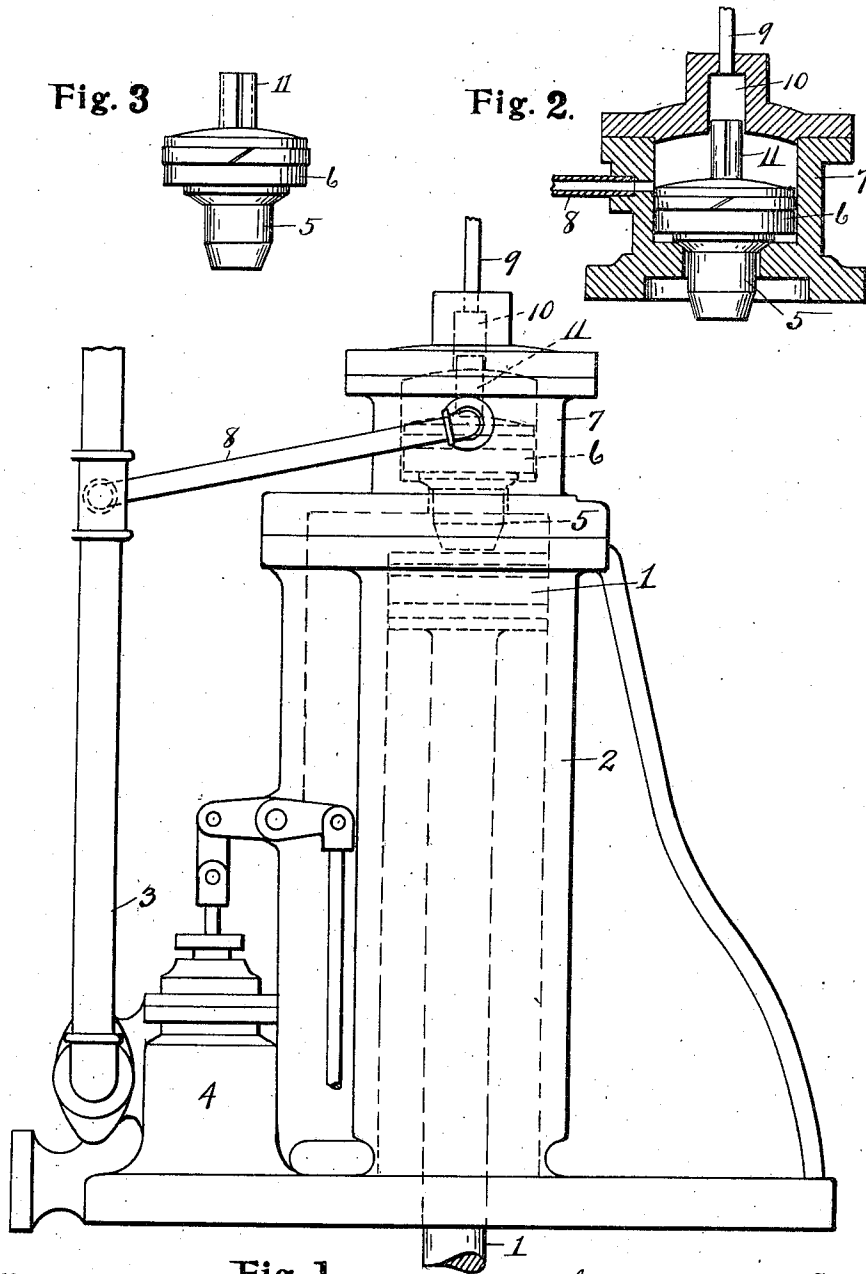


C. L. BOCKUS & R. G. HAUSDORFER.
CUSHIONING ATTACHMENT FOR POWER HAMMERS.
APPLICATION FILED JAN. 26, 1911.

1,000,769.

Patented Aug. 15, 1911.



Witnesses

O. B. Baenziger.
V. C. Spratt.

Fig. 1

Charles L. Bockus Inventors
Reinhold G. Hausdorfer
Parker & Burton Attorneys

UNITED STATES PATENT OFFICE.

CHARLES L. BOCKUS, OF DETROIT, MICHIGAN, AND REINHOLD G. HAUSDORFER, OF
TOLEDO, OHIO.

CUSHIONING ATTACHMENT FOR POWER-HAMMERS.

1,000,769.

Specification of Letters Patent. Patented Aug. 15, 1911.

Application filed January 26, 1911. Serial No. 604,703.

To all whom it may concern:

Be it known that we, CHARLES L. BOCKUS, a subject of the King of Great Britain, residing at Detroit, in the county of Wayne and State of Michigan, and REINHOLD G. HAUSDORFER, a citizen of the United States, residing at Toledo, county of Lucas, State of Ohio, have invented a certain new and useful Improvement in Cushioning Attachments for Power-Hammers, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to power hammers.

It has for its object an improved cushioning attachment adapted to cushion the hammer on the up or return stroke, after the blow has been given.

In the drawings:—Figure 1, is a side elevation of the hammer cylinder, and the cushioning attachment thereto. Fig. 2, is a sectional elevation of the cushioning attachment. Fig. 3, is a side elevation of the cushioning piston.

The hammer piston 1 and the hammer cylinder 2 are of the standard construction of upright cylinder with piston moving vertically therein, into which steam is admitted under the piston and above the piston from the steam pipe 3 which delivers through a valve in the casing 4.

Into the upper end of the cylinder 2 is inserted the end 5 of a cushioning piston 6 that can reciprocate in an independent cylinder 7 secured to the upper end of the main cylinder. The independent cylinder 7 is furnished with steam through pipe 8 which reaches from the main feed pipe 3 and is inclined upward from its receiving end to the end where it delivers into the cylinder 7 just above the upper surface of the piston 6 when the piston 6 is at its lowermost position. The piston 6 acts as a valve to close the passage between the cylinder 7 and the cylinder 2. As soon as the main piston engages the cushioning piston and lifts it very slightly, the port through which the steam enters from the pipe 8 is closed, the chamber still containing a quantity of steam at boiler pressure which compresses and acts as a cushion to prevent any injurious result from

the too sudden lift or the too great lift of the hammer piston.

Provision for the admission of oil is made through pipe 9 which leads directly into chamber 10, which chamber is a guide for the stem 11 of the cushioning piston 6; the oil admitted through the pipe 9 lubricates not only the cushioning piston but also the main piston and the main cylinder.

Pipe 8 is preferably arranged in an inclined direction with the lower end at the steam pipe 3 in order that any water which may condense in the cushioning cylinder may run into the steam pipe 3 and thence be discharged into the main cylinder and carried out with the exhaust.

What we claim is:—

1. A cushioning piston for a power hammer, having in combination with a main cylinder a piston reciprocating therein, a cushioning cylinder located above and having a passage connecting with said main cylinder, the said cushioning cylinder provided with an auxiliary chamber at its top, a cushioning piston reciprocating in said cushioning cylinder, a stem attached to said cushioning piston reciprocating in said passage between the two cylinders, somewhat spaced from the confining wall of said passage and adapted to be engaged by the piston of the main cylinder, a second stem attached to the opposite side of said piston and adapted to reciprocate in said auxiliary chamber as a guide, and a steam inlet port arranged to admit steam into said cushioning cylinder above the cushioning piston, the said cushioning piston and first-mentioned stem being thereby adapted to act as a valve controlling the passage between the two cylinders and about the first-mentioned stem, substantially as described.

2. In combination with a main cylinder, a power hammer, a cushioning cylinder arranged above the main cylinder, a cushioning piston reciprocating in said cushioning cylinder, a piston reciprocating in the main cylinder, a stem projecting from said cushioning piston into the main cylinder, adapted to be engaged by the piston therein, means for introducing and exhausting steam from above the cushioning cylinder, the head of the cushioning cylinder having a chamber and an oil pipe leading thereinto, and a second stem having a vertical slot, attached to

the top of the cushioning piston and reciprocating in said chamber, whereby oil may be introduced into the cushioning cylinder, lubricating the cushioning piston, and thence
5 find its way into the main cylinder lubricating its piston, substantially as described.

3. A cushioning piston for a power hammer, having in combination with a main cylinder a piston reciprocating therein, a
10 cushioning cylinder located above and having a passage communicating with the main cylinder, a cushioning piston reciprocating in said cushioning cylinder, a stem attached to said cushioning piston reciprocating
15 loosely in said passage communicating between the two cylinders and adapted to be engaged by the piston of the main cylinder, and a steam inlet port arranged to admit steam into said cushioning cylinder above
20 the cushioning piston, the said cushioning piston and stem being thereby adapted to act as a valve controlling the passage communicating between the two cylinders, substantially as described.

25 4. A cushioning piston for a power hammer, having in combination with a main cylinder a piston reciprocating therein, a cushioning cylinder located above and having a passage communicating with said
30 main cylinder, a cushioning piston reciprocating in said cushioning cylinder, a stem attached to said piston, reciprocating loosely in said passage communicating between the cylinders, and adapted to be engaged by
35 the piston of the main cylinder, means for

introducing oil above said cushioning piston, and a steam inlet port arranged to admit steam into said cushioning cylinder above the cushioning piston, the said cushioning piston and stem being thereby adapted
40 to act as a valve controlling the passage communicating between the two cylinders and providing a passage-way for the lubricant, substantially as described.

5. A cushioning piston for a power hammer, having in combination with the main cylinder a piston reciprocating therein, a cushioning cylinder located above and having a passage communicating with said
50 main cylinder, a cushioning piston reciprocating in said cushioning cylinder, a stem depending from said cushioning piston through said passage into the main cylinder and adapted to be engaged by the piston
55 and main cylinder, and an independent supply of steam admitted into the cushioning cylinder just above the cushioning piston when at rest, said cushioning piston being
60 thereby adapted, in its initial movement upward, to cut off the steam supply and trap the steam in the cushioning cylinder as a cushioning element, substantially as described.

In testimony whereof, we sign this specification in the presence of two witnesses.

CHARLES L. BOCKUS.

REINHOLD G. HAUSDORFER.

Witnesses:

LOTTA LEE BRAY,

R. A. PARKER.