

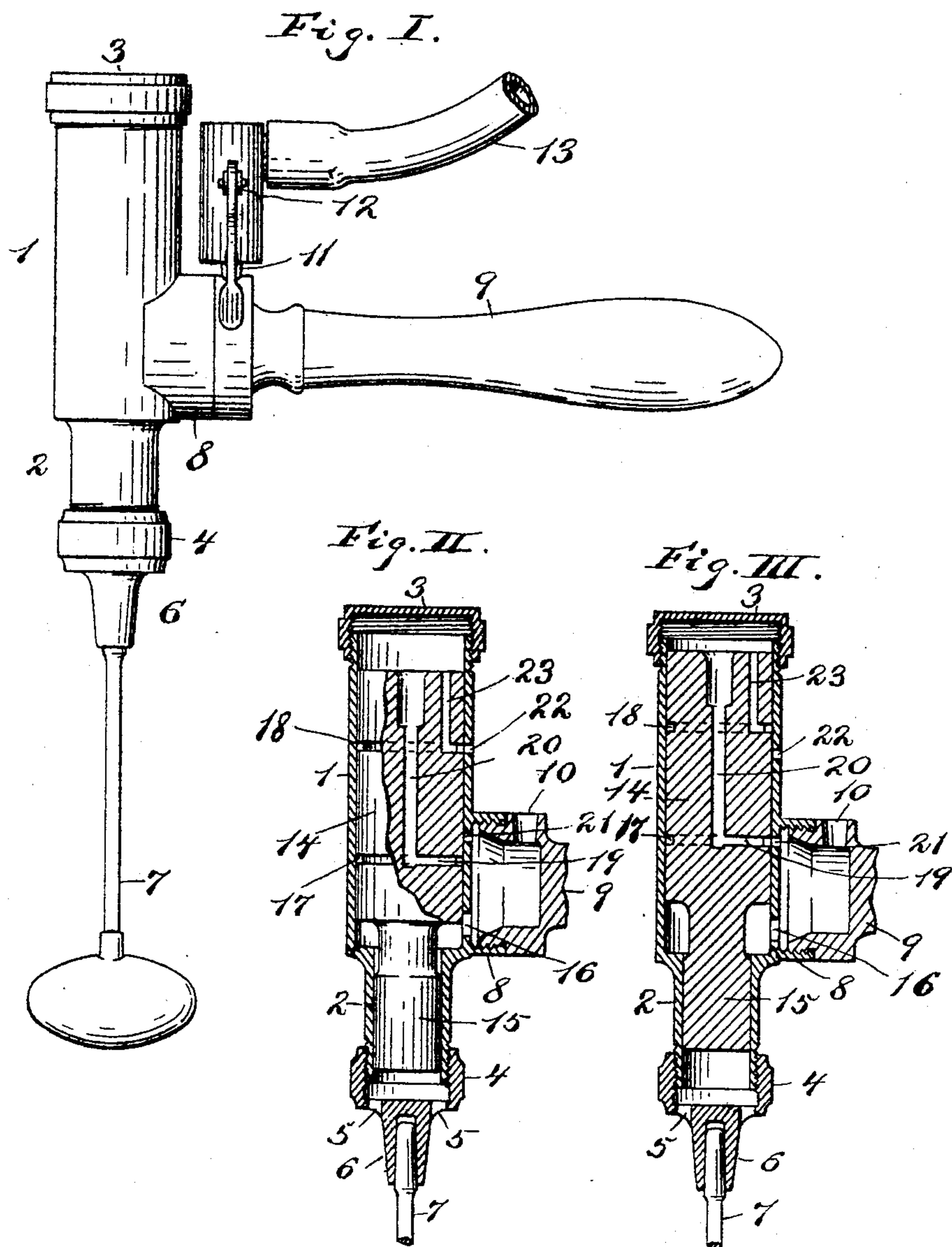
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J. H. CHAMP.

IMPLEMENT FOR IMPARTING VIBRATORY IMPACTS.

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Witnesses:

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UNITED STATES PATENT OFFICE.

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IMPLEMENT FOR IMPARTING VIBRATORY IMPACTS.

No. 803,877.

Specification of Letters Patent.

Patented Nov. 7, 1905.

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To all whom it may concern:

Be it known that I, JOSEPH H. CHAMP, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented certain new and useful Improvements in Implements for Imparting Vibratory Impacts, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle so as to distinguish it from other inventions.

The annexed drawings and the following description set forth in detail one mechanical form embodying the invention, such detail construction being but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings, Figure I represents a side view of my improved implement for imparting vibratory impacts; and Figs. II and III, axial sections of the cylinder and piston, illustrating the latter in position at the two extremes of its throw.

While the implement may be employed for various purposes where it is desired to impart vibratory impact, the principal purpose of the implement is its employment for imparting vibratory motion to what may be termed "vibratodes"—that is, pads or instruments adapted for application to the several portions of the body for imparting massage or similar motion to such portions of the body.

A cylinder 1 has a neck 2 of smaller diameter at one end and is closed by a cap 3 at the other end. The small-diameter neck is closed by a screw-cap 4, having openings 5 and formed with a socket 6, into which the shank of the vibratode 7 fits. A neck 8 projects from the side of the cylinder near the point where the latter merges into the small-diameter neck, and a handle 9 is screwed into said neck. An opening 10 enters the chamber formed in the interior of the lateral neck and the end of the handle, and a nipple 11, preferably provided with a controlling-valve 12 and secured in the end of a tube 13 for conveying the motive fluid, may fit into said hole. A long cylindrical plunger 14 fits to reciprocate in the cylinder and has a neck 15 at one end, which neck fits to reciprocate in the neck of the cylinder. A permanently-open inlet-port 16 opens from the inlet-chamber into the neck end of the cylinder, so that the small annular end area of the plunger is

under permanent pressure, forcing the plunger toward the closed end of the cylinder. The plunger has two annular circumferential channels 17 and 18, and one, 17, of said channels has a radial channel 19 to the axis of the plunger where it communicates with an axial channel 20, extending to the large-area end of the plunger. This circumferential channel registers with an inlet-port 21 from the inlet-chamber when the plunger is at the extreme of its stroke toward the closed end of the cylinder, so that motive fluid may be conveyed to the closed end of the cylinder through channels 17, 19, and 20. The other circumferential channel of the plunger registers with an exhaust-port 22 in the cylinder when the plunger is at the other extreme of its throw on the stroke toward the neck end of the cylinder. This circumferential channel has a bent channel 23 extending through the plunger to the large-area face of the same, so that the motive fluid may exhaust through the channels 23 and 18 and port 22 out into the atmosphere when the plunger reaches the extreme of its stroke toward the neck. The just-described positions of the plunger are respectively illustrated in Fig. III and Fig. II. As the circumferential channels and their ports are comparatively small, the registering of such channels and ports occupies a comparatively short portion of the throw of the plunger, so that inlet and exhaust of motive fluid is quickly cut off in the reciprocations of the plunger.

In practice when motive fluid, such as compressed air or other gaseous or aeriform fluid under pressure, is connected to the inlet of the tool and we take the parts in the position of Fig. II, the motive fluid bears constantly against the small annular pressure area of the plunger and tends to force the same toward the closed end of the cylinder from which at the present moment the motive fluid may escape, thereby allowing the plunger to move in that direction. The moment the plunger has moved the width of the exhaust channel and port the exhaust is cut off and the plunger moves against a cushion until the inlet-channel of the plunger communicates with the inlet-port, when motive fluid is admitted to the large-area face of the plunger and the live pressure against the large-area face of the plunger will overcome the same pressure against the small annular area of the same and drive the plunger in the opposite direction.

The plunger will thus reciprocate against a cushion of motive fluid at both ends of the throw, and the rapid and cushioned reciprocations of the plunger will vibrate the tool
 5 and the pad or instrument supported by it, imparting a vibratory impact to whatever such pad or instrument is applied. Reciprocation of the plunger against fluid cushions at both ends of the throw makes perfect vi-
 10 bration without hard shocks or jars.

Other modes of applying the principle of my invention may be employed for the mode herein explained. Change may therefore be made as regards the mechanism thus dis-
 15 closed, provided the principles of construction set forth respectively in the following claims are employed.

I therefore particularly point out and distinctly claim as my invention—

20 1. In an implement for imparting vibratory impact, the combination of a cylinder having closed ends and having a permanently-open inlet-port at one end, an inlet-port and an exhaust-port, and a plunger hav-
 25 ing a small-area end face exposed to the permanently-open inlet-port and a large-area end face having an inlet and an exhaust channel opening through it and formed with a circumferential inlet-channel and a circumfer-
 30 ential exhaust-channel respectively connected to said channels and respectively registering with the inlet-port and exhaust-port at opposite ends of its throw.

35 2. In an implement for imparting vibratory impact, the combination of a cylinder

having one end closed and formed at the other end with a smaller-diameter neck having openings in its end and a socket for the attachment of the vibration instrument and said cylinder having a permanently-open in-
 40 let-port at the neck end and an inlet-port and an exhaust-port, and a plunger having a neck at one end sliding in the cylinder-neck and a circumferential inlet-channel registering at one end of the throw with the inlet-port and
 45 communicating with a channel opening through the large-area face of the plunger and a circumferential exhaust-channel registering at the other end of the throw with the
 50 exhaust-port and communicating with a channel opening through the large-area face of the plunger.

3. In an implement for imparting vibratory impact, the combination of a cylinder 1 having neck 2 and socket 6, and formed
 55 with a lateral neck 8 and inlet-ports 16 and 21 and exhaust-port 22, a handle 9 in said neck, and a plunger 14 having a neck 15 and formed with a circumferential inlet-channel
 60 17 having channels 19 and 20 and a circumferential exhaust-channel 18 having a channel 23.

In testimony that I claim the foregoing to be my invention I have hereunto set my hand this 22d day of May, A. D. 1903.

JOSEPH H. CHAMP.

Witnesses:

WM. SECHER,
 P. O. MATTHEWS.