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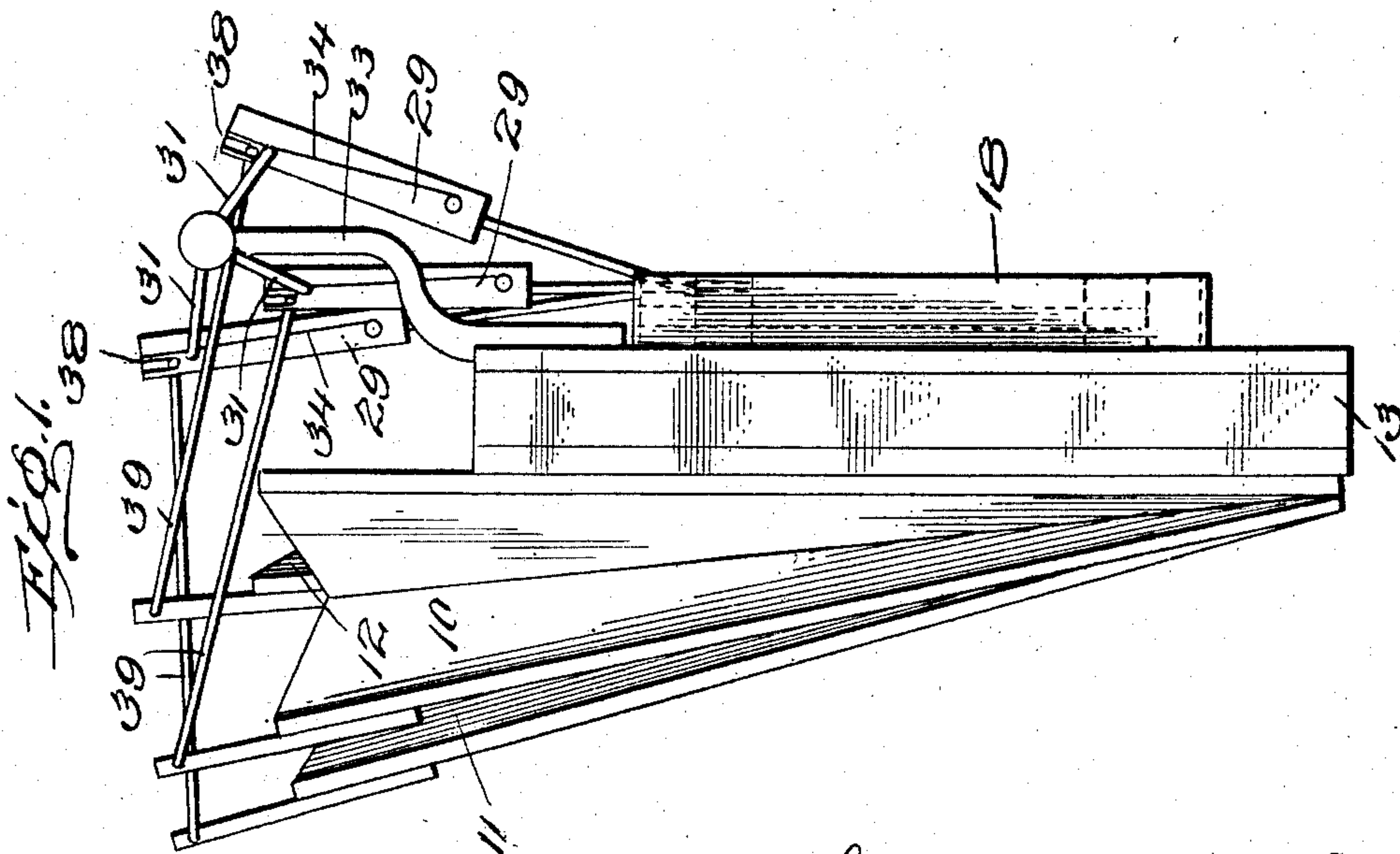
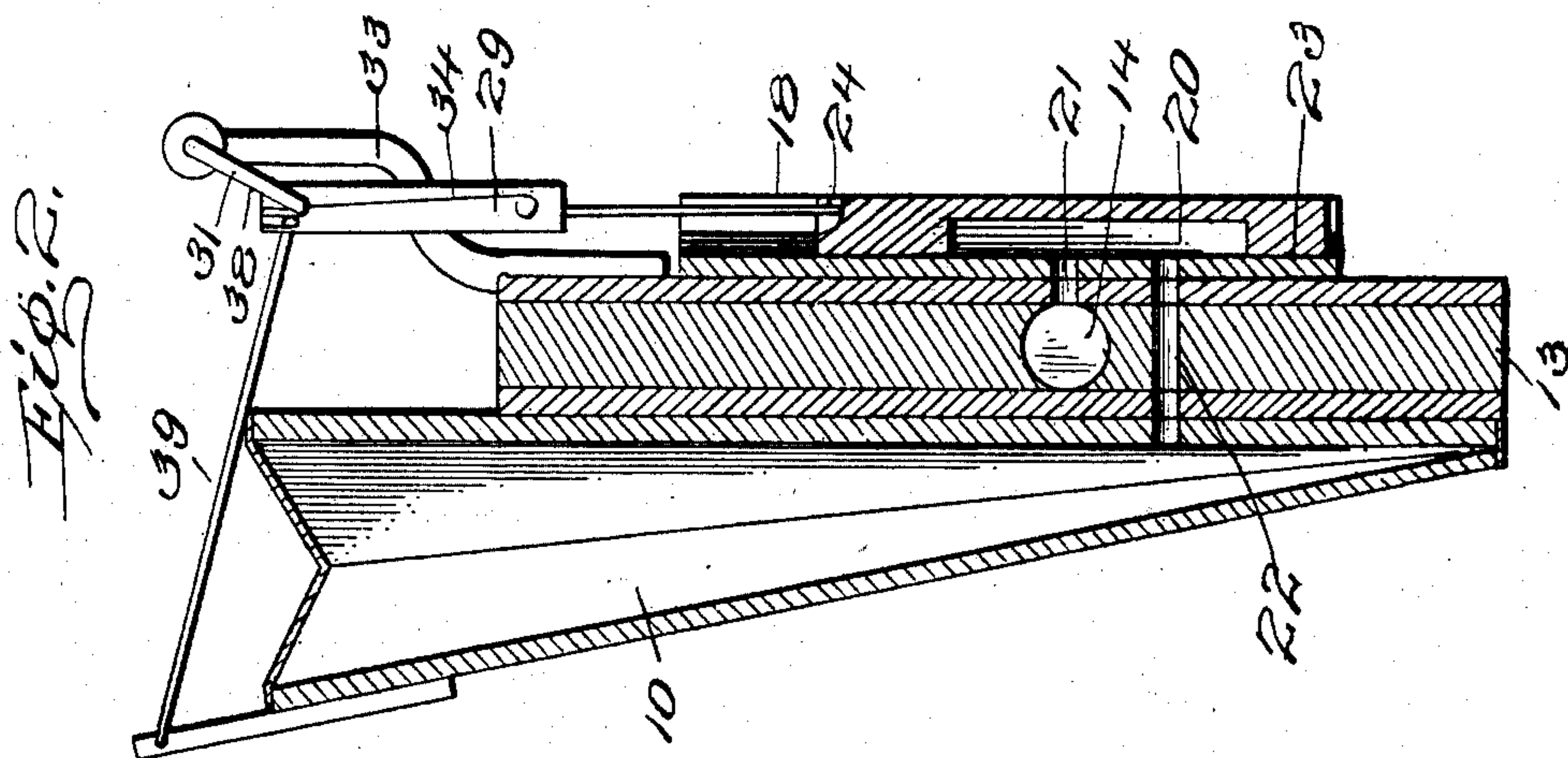
PATENTED AUG. 27, 1907.

E. D. ACKERMAN, C. E. CLINTON & R. N. ELTOM.

PNEUMATIC ENGINE.

APPLICATION FILED FEB. 7, 1906.

2 SHEETS—SHEET 1.



Witnesses

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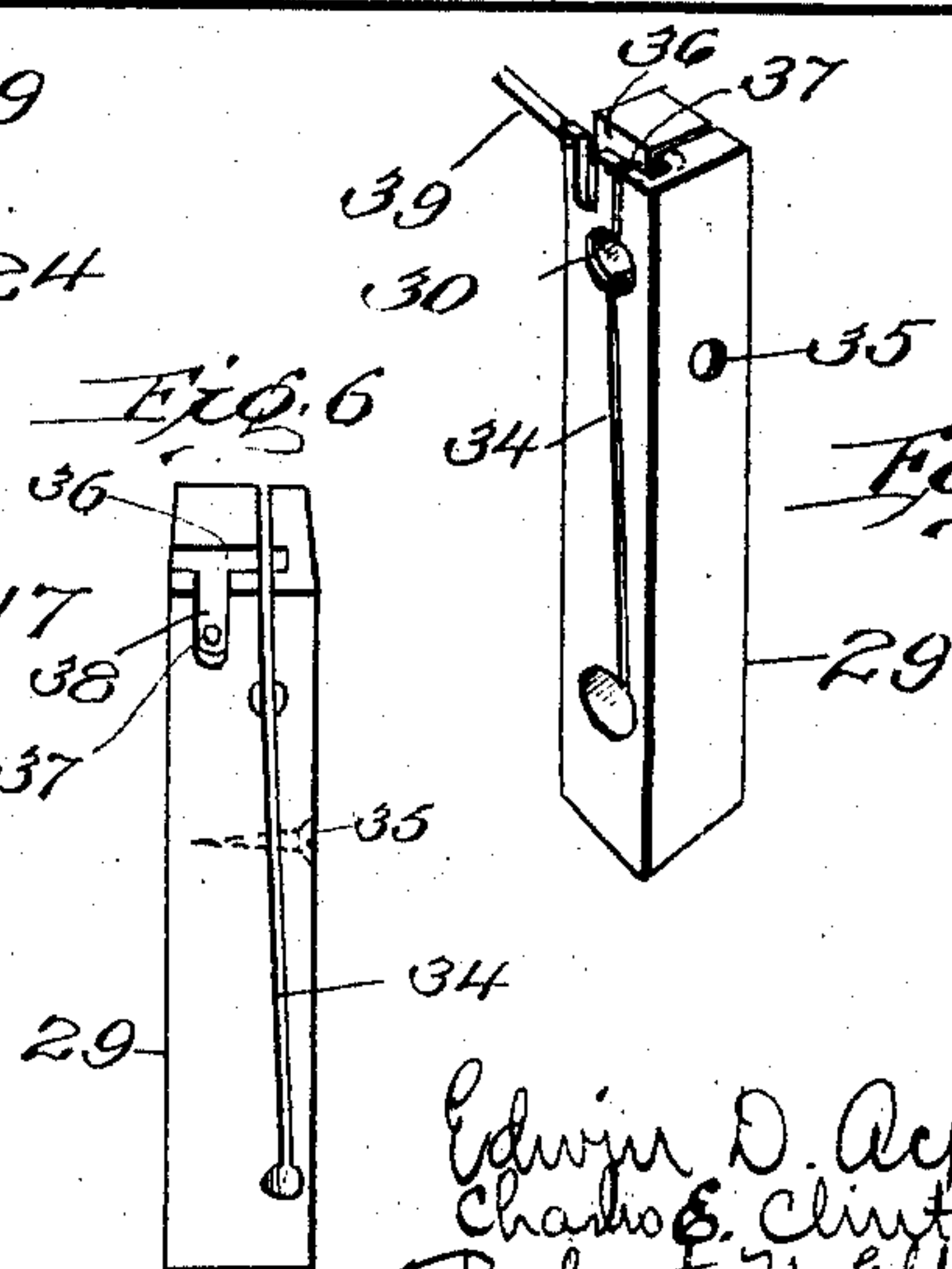
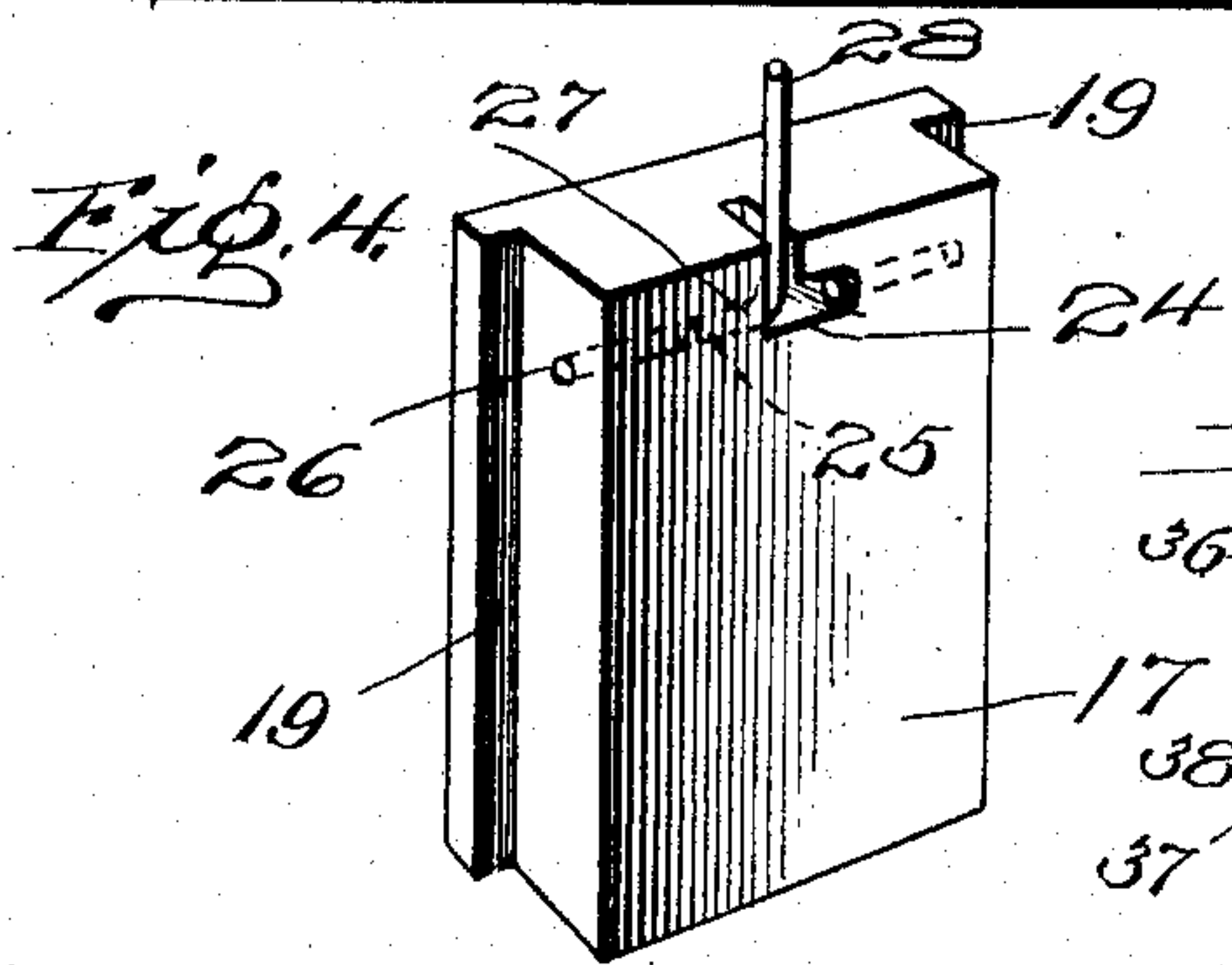
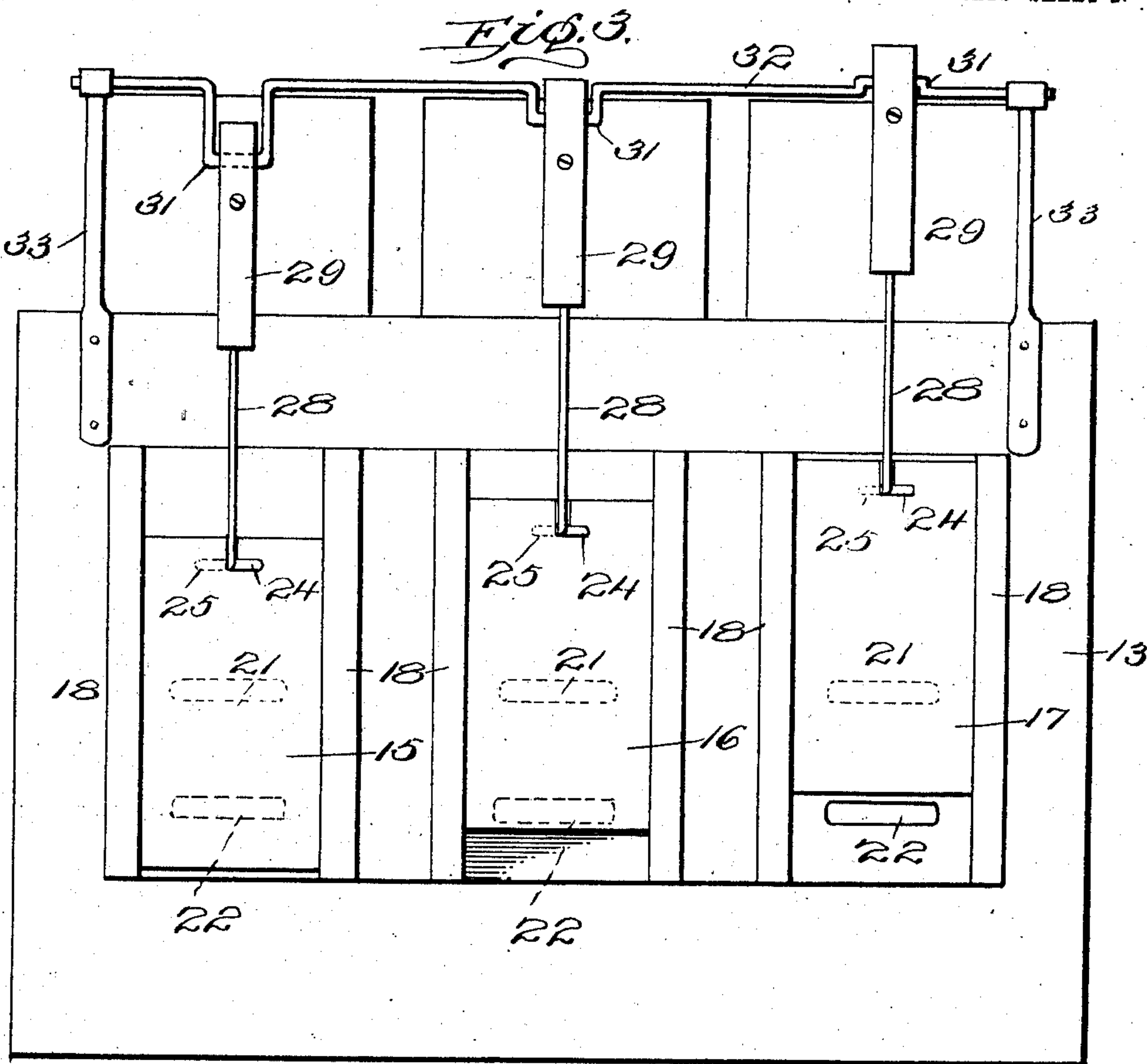
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2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

EDWIN D. ACKERMAN, OF NEW YORK, AND CHARLES E. CLINTON AND ROBERT N. ELTOM, OF CORONA, NEW YORK, ASSIGNORS, BY DIRECT AND MESNE ASSIGNMENTS, TO THE PIANORA COMPANY, A CORPORATION OF NEW YORK.

PNEUMATIC ENGINE.

No. 864,220.

Specification of Letters Patent.

Patented Aug. 27, 1907.

Application filed February 7, 1906. Serial No. 299,973.

To all whom it may concern:

Be it known that we, EDWIN D. ACKERMAN, residing at New York, county of New York, and CHARLES E. CLINTON and ROBERT N. ELTOM, residing at Corona, in the county of Queens, in the State of New York, have invented certain new and useful Improvements in Pneumatic Engines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to pneumatic engines and specifically to the type commonly employed in machines for playing musical instruments, and has for an object to provide an engine embodying new and improved features of reliability, economy, simplicity and efficiency.

A further object of the invention is to provide a pneumatic engine embodying slide valves of improved construction, and a valve operating rod associated therewith designed for operating the said valve.

A further object of the invention is to provide a slide valve embodying new and improved means for connecting the valve operating rod thereto.

A further object of the invention is to provide a valve operating rod embodying new and improved means for connecting the usual pitman and rods from the several pneumatics.

With these and other objects in view the invention comprises certain novel constructions, combinations and arrangements of parts, as will be hereinafter fully described and claimed.

In the accompanying drawings:—Figure 1 is a view of the improved pneumatic engine in end elevation. Fig. 2 is a vertical sectional view of the improved pneumatic engine. Fig. 3 is a view of the engine in side elevation showing the relative operative positions of the several slide valves. Fig. 4 is a detail perspective view of one of the slide valves detached. Fig. 5 is a detail, perspective view of the block portion of the valve operating rod.

Like characters of reference designate corresponding parts throughout the several views.

In its preferred embodiment, the improved pneumatic engine forming the subject-matter of this application, comprises a plurality of pneumatics 10, 11, and 12 of the usual and ordinary bellows type secured to the strip or frame 13 which is provided longitudinally with a duct 14 communicating with the exhaust chamber usually and ordinarily employed.

Upon the side of the plate 13, opposite the pneumatics, are slidably mounted the slide valves 15, 16 and 17 for communication, respectively, with the pneumatics

10, 11 and 12, and slidably mounted in the ways formed by the flanges 18, which engage the lips 19 extending longitudinally along the edges of the slide valves. The valves are each provided with a recess 20 formed in the back thereof proportioned to simultaneously cover the port 21 leading from the duct 14 and the port 22, leading from the several pneumatics. The said slide valves are likewise provided with a contact rib 23 positioned and proportioned to cover the port 22 as the valve slides upward and upon a further movement of the said valve to uncover the said port and assume a position between the ports 21 and 22. The upper transverse edge of each of said valves is provided with an L-shaped aperture 24, the longitudinal arm of said L transecting the top transverse edge, and with a socket 25 formed therein in alinement with and opposite to the transverse arm of said aperture. In practice, the socket 25 will be formed by projecting a hole 26 entirely and transversely through the valve block transecting in its course the transverse arm of the aperture. Within the socket 25 is inserted the right-angled end portion 27 of the valve rod 28, such emplacement being accomplished by inserting the said angular portion within the transverse arm of the aperture and moving it slidably into the socket whereupon the rod is moved pivotally upon the said angular portion to occupy the longitudinal arm of the aperture, as shown in Figs. 3 and 4.

Upon the rod 28 is rigidly mounted a block 29 by inserting the said rod into the lower end of the said block. Adjacent its upper end the block 29 is provided with a journal opening 30 proportioned for engaging the crank arm 31 of the shaft 32 which is journaled upon upstanding arms or brackets 33 carried by the frame 13. To permit the emplacement of the block 29 upon the said crank arm, the said block is slitted, as at 34, the said slit extending substantially longitudinally of the block and transecting the journal opening 30, and the parts secured together in any approved manner as by a screw inserted in the opening 35. The block 29 is bifurcated by a slit 36 formed in the upper end, and a socket 37 formed by projecting a hole transversely through the said block which is slotted out by a slot 38 in one of the sides of the said block. Pitman rods 39, from the several pneumatics, are provided with right-angled bent extremities, which are inserted in the said socket 37 by slidably passing the said pitman rod through the slot 38 and turning the rod pivotally upon the said angular portion into the slot 36 which engages the side of the rod and prevents the lateral displacement of the said angular portion from the socket.

It will be noted that the socket 37 is disposed above the journal opening 30 whereby the pressure exerted

by the pneumatics 10 tends to move the block pivotally upon the crank arms 31 and to force the valves 17 more closely in contact with the surface of the plate 13.

From the foregoing description it is believed the use 5 and operation of the improved pneumatic engine will be clearly understood and fully appreciated.

What we claim is:—

1. In a pneumatic engine, a slide valve provided with an L-shaped aperture in one end and with a socket opening 10 into and in alinement with the transverse arm of the aperture, and a valve-operating rod having a right-angled bent extremity proportioned to be inserted into the transverse arm of the aperture and slidably moved into the socket and the rod moved pivotally to occupy the longitudinal arm 15 of the aperture.

2. In a pneumatic engine, a slide valve provided with an L-shaped aperture in one end and with a socket opening into and in alinement with and opposite to the transverse arm of the aperture, and a valve operating rod having a 20 right-angled bent extremity proportioned to be inserted into the transverse arm of the aperture, and slidably moved into the socket, and the rod pivotally moved upon said right-angled bent portion into and to occupy the longitudinal arm of the aperture.

3. In a pneumatic engine, a valve operator comprising 25 a bifurcated block provided with means for pivotal connection to a crank arm with a socket projected transversely through both sides of the block and slotted out upon one side, a rod rigidly extending from the end of the block and 30 provided with means for pivotal connection with the valve, and a pitman rod pivotally seated within the socket and held from displacement by the slot bifurcating the block.

4. In a pneumatic engine, a valve operator comprising a bifurcated block provided with a slotted opening for pivotal connection to a crank arm and with a socket projected transversely through both sides of the block and 35 transecting the slot bifurcating the arm and slotted out upon one side, a rod rigidly extending from the end of the block and provided with a right-angled bent portion for pivotal connection with a valve, and a pitman rod pivotally seated within the socket and held from displacement 40 by the slot bifurcating the block.

5. In a pneumatic engine, a slide valve provided with an L-shaped aperture in one end, and with a socket opening into and in alinement and opposite to the transverse arm 45 of the aperture, a valve operator comprising a bifurcated block provided with a slotted opening for pivotal connection to a crank arm and with a socket projected transversely through both sides of the block and transecting the slot bifurcating the block and slotted out upon one 50 side, a rod rigidly extending from the end of the block and provided with a right-angled bent extremity proportioned to be inserted into the transverse arm of the aperture in the valve, and slidably moved into the socket and the rod moved pivotally to occupy the longitudinal arm of the 55 aperture, and a pitman rod pivotally seated within the socket of the block and held pivotally therein, and from displacement by the slot bifurcating the block.

In testimony whereof we affix our signatures in presence of two witnesses.

EDWIN D. ACKERMAN.
CHARLES E. CLINTON.
ROBERT N. ELTOM.

Witnesses:

SAMUEL A. LICHTENSTEIN,
HUGO MOCK.