No. 764,630. PATENTED JULY 12, 1904.

L. T. PYOTT.

AIR COMPRESSOR.

APPLICATION FILED NOV. 9, 1900. RENEWED DEC. 7, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1

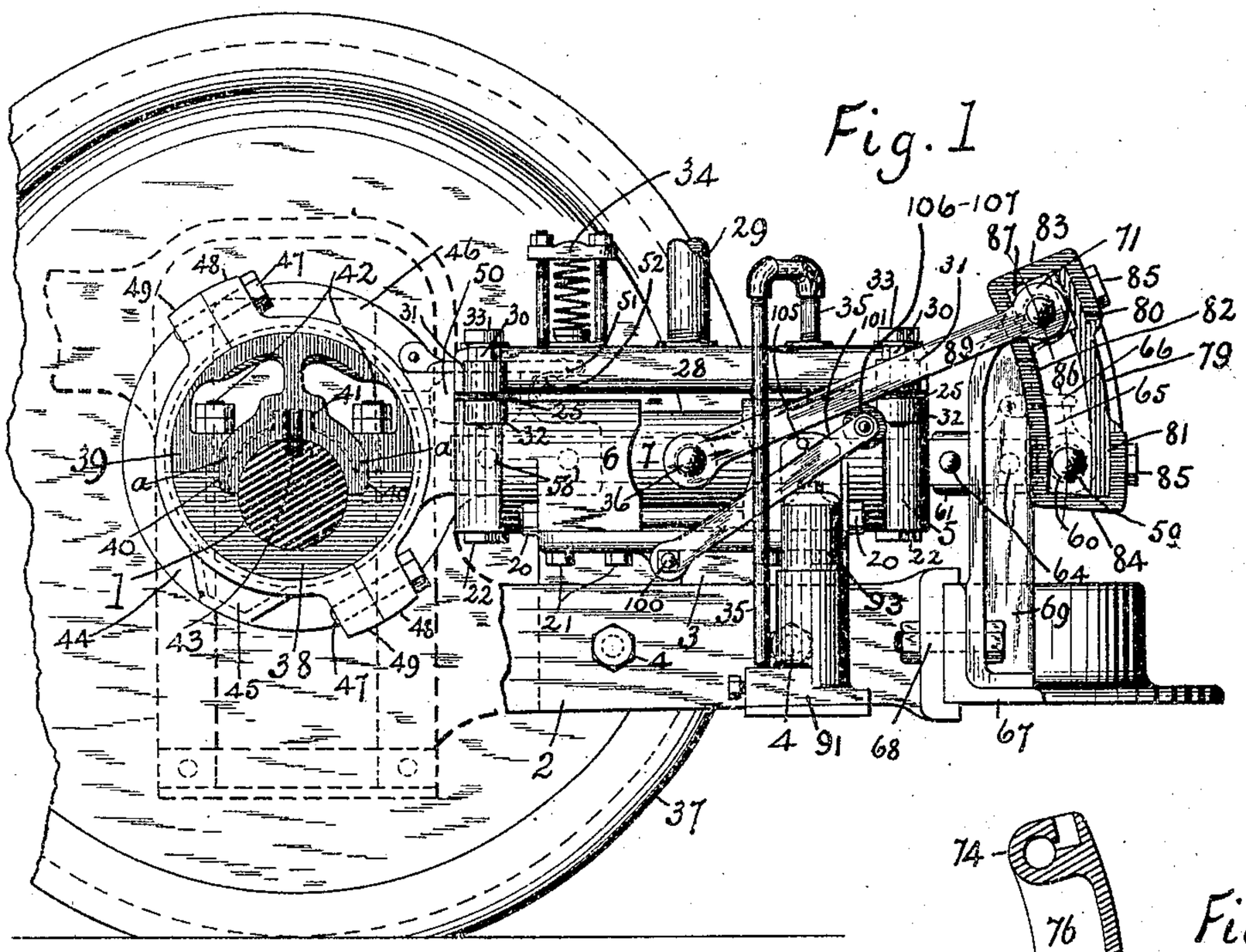

Fig. 4

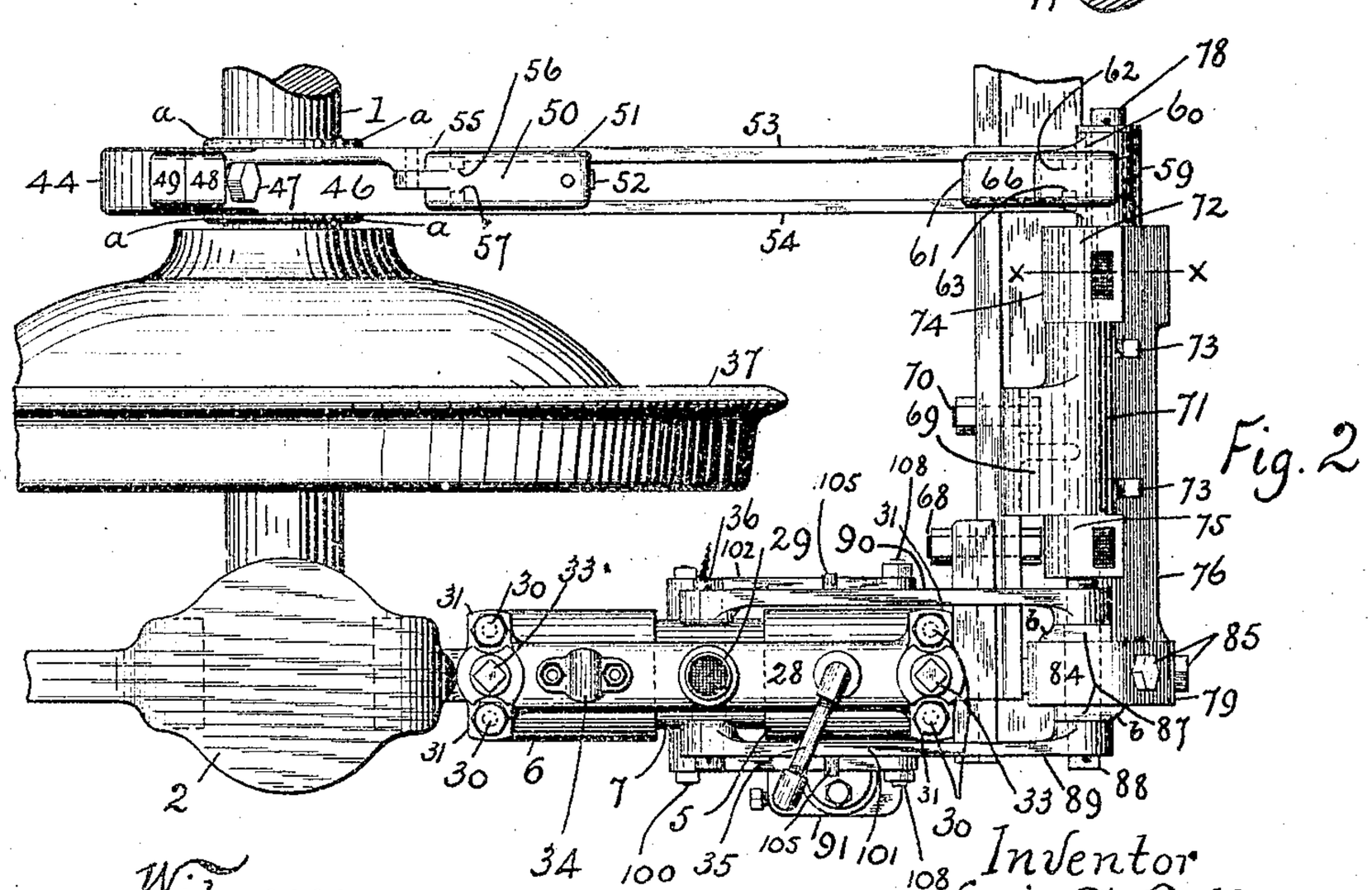

Fig. 2

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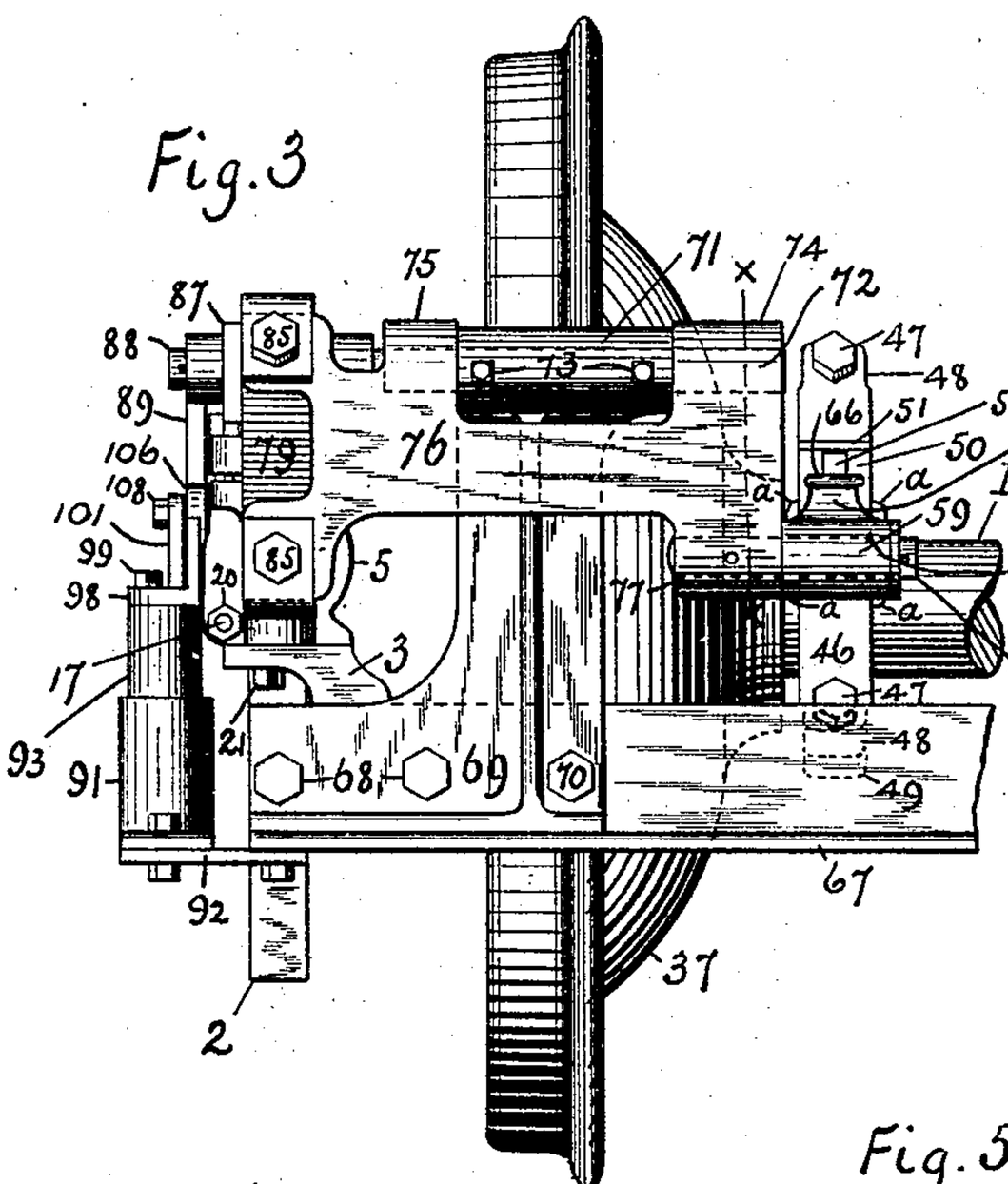
Fig. 3



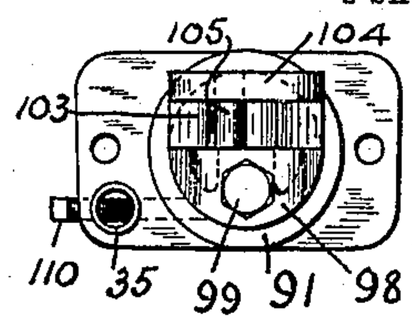


Fig. 9

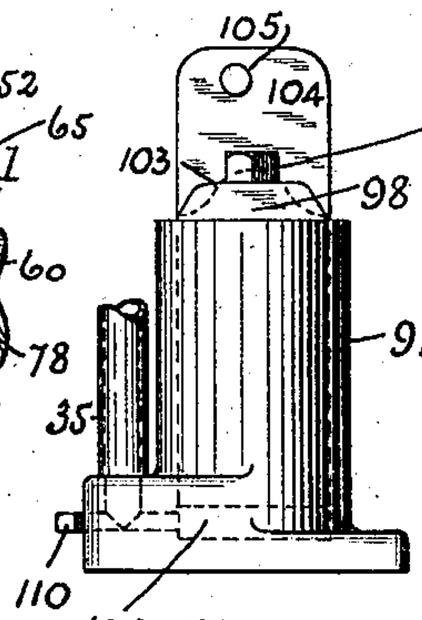


Fig. 8

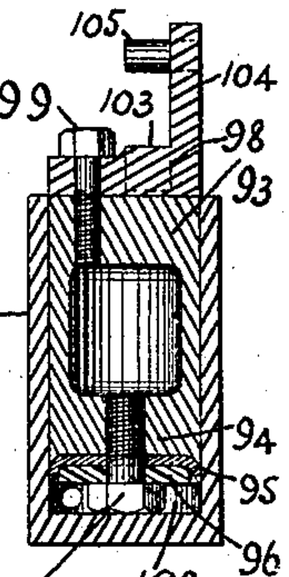


Fig. 10

Fig. 5

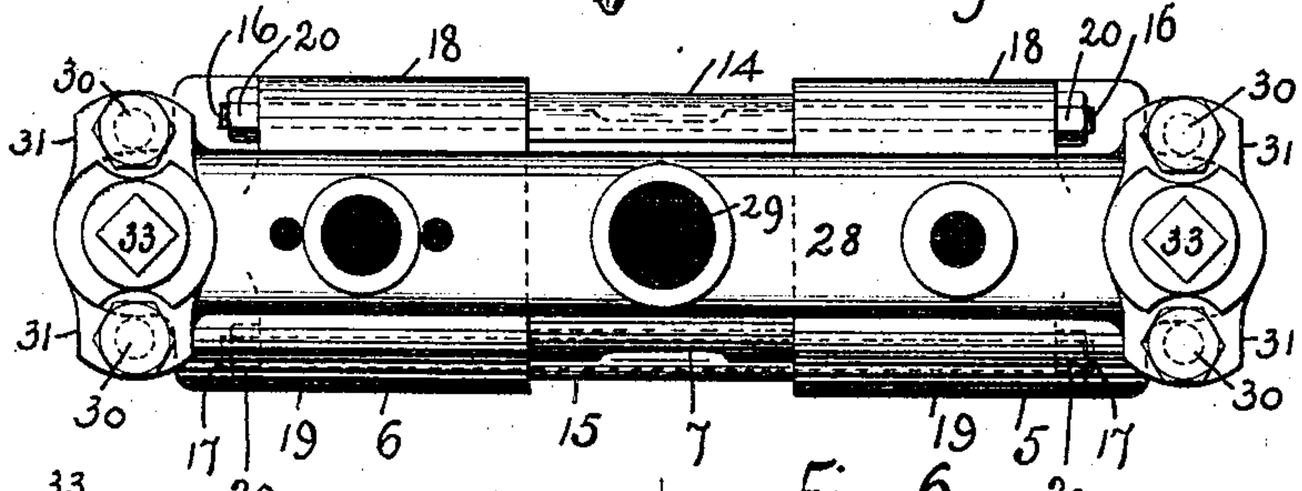


Fig. 6

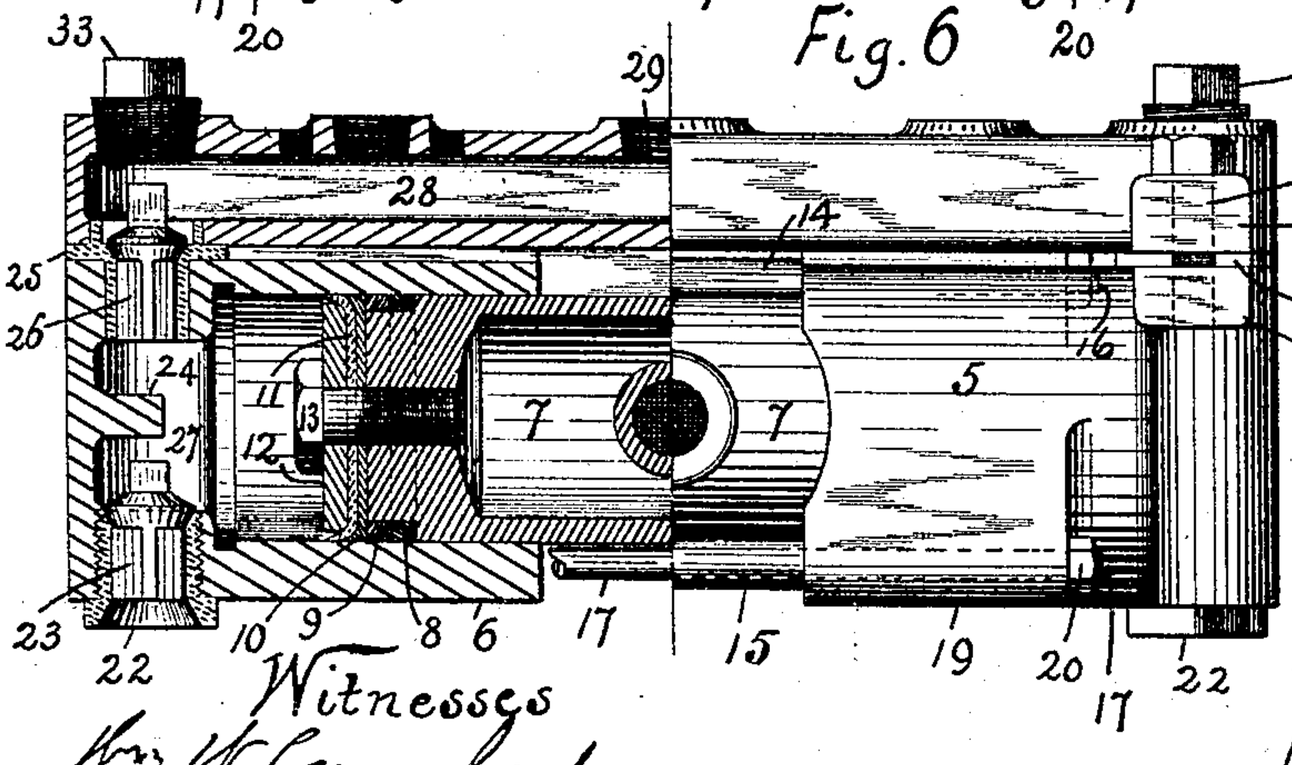
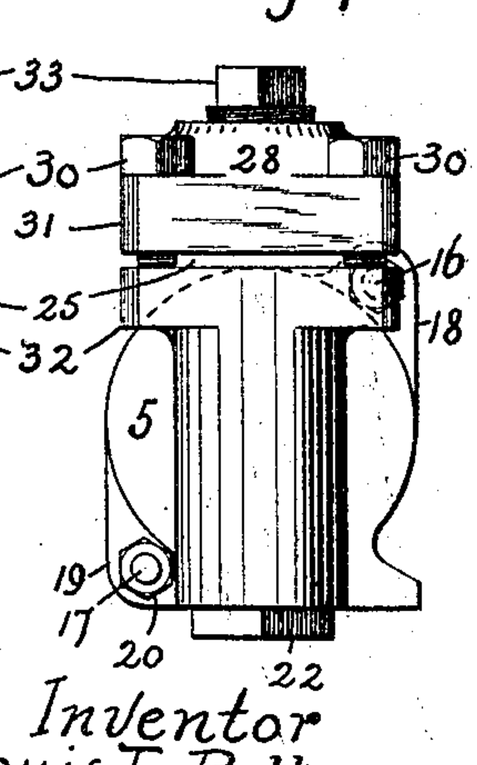


Fig. 7



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No. 764,630. Patented July 12, 1904.

UNITED STATES PATENT OFFICE.

LOUIS T. PYOTT, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO JOHN E. REYBURN, OF PHILADELPHIA, PENNSYLVANIA.

AIR-COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 764,630, dated July 12, 1904.

Application filed November 9, 1900. Renewed December 7, 1903. Serial No. 184,230. (No model.)

To all whom it may concern:

Be it known that I, LOUIS T. PYOTT, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Air-Compressors, of which the following is a specification.

My invention relates to improvements in car-brakes wherein the mechanism I employ is arranged and secured to the truck-frame in a position readily seen and accessible for inspection without the necessity of having a pit over which the car must be placed for such inspection, and I also place the driven mechanism on the spring-cushioned truck so it is carried without shock and jarring. The driving mechanism I locate on the axle and with mechanism which occupies a minimum amount of axle-space, and therefore I am enabled to apply my brake mechanism to a great variety of trucks, as in many truck constructions only a very limited amount of the axle-space is available for such purpose, and by separating the driving and driven mechanism I eliminate from each the different shocks, movements, and jarrings the other is subjected to, while gaining more room, the mechanism being constructed to store the power at a fixed limit of pressure, and upon the limit being reached automatically stop the mechanism, and upon a reduction of pressure below the limit to again and by gravity of the parts automatically engage the mechanism for further storage and without any manual intervention or supervision keep up a desired power-pressure.

In the accompanying drawings I have illustrated the means I employ to accomplish the desired results, and wherein—

Figure 1 is a side elevation of a portion of a truck with my mechanism attached thereto. Fig. 2 is a plan of Fig. 1. Fig. 3 is an end elevation. Fig. 4 is a section through the rocker on lines *x x*, Figs. 2, 3. Fig. 5 is a top view of the tandem cylinders and their connecting-chamber in enlarged scale. Fig. 6 is one half in side elevation and one half in central vertical section of the tandem cylinders and their connecting-chamber also in enlarged scale. Fig. 7 is an end elevation of the tandem cylinders also in enlarged scale. Fig. 8 is a side elevation of the governor-cylinder. Fig. 9 is a top view of the governor-cylinder. Fig. 10 is a central vertical section of the governor-cylinder and its piston.

Similar characters of reference indicate similar parts throughout the several views.

By reference to the drawings will be seen the axle 1 and truck-frame 2, to which my mechanism is applied, and to trucks of other constructions it can equally well be applied, with minor changes of the attachments by which it is secured and held. A bracket 3 is secured by bolts 4 to frame 2, and mounted upon the bracket are tandem compressing-cylinders 5 6. These cylinders are each single-acting and contain a common double-ended piston 7, fitted at each end with double rings 8 9, preferably of Babbitt or soft metal, exterior to which is placed a packing-seat 10, on which is seated a flexible disk-packing 11, having its outer edge beveled and turned over to fit snugly to the bore of the cylinder, forced thereto by the pressure in the cylinder and held in place by the follower 12 and bolt 13. The cylinders are spaced by thimbles 14 15, through which and through lugs 18 19 pass bolts 16 17, having nuts 20 exterior to the lugs. This enables the attachment of driving mechanism to the piston by which both cylinders are operated and does away with stuffing-boxes, piston-rods, cross-heads, and guides, as well as greatly economizing the space necessary to place the mechanism. Bolts 21 secure the cylinders 5 6 to the bracket 3. A removable valve-seat 22 is in the lower outer end of each cylinder, and seated upon their upper ends are inlet-valves 23, and the lift or upward movement of these valves is limited by lugs 24 in the cylinder ends. Above valves 23 are valve-seats 25, on which are seated the outlet-valves 26. As the piston 7 moves away from the cylinder end the valve 23 is lifted off of its seat 22 and air is admitted to chamber 27 and the interior of the cylinder, the valve 26 during this time being seated or closed. Upon the reverse movement of piston 7 valve 23 is closed, 26 is forced

from its seat, and the air passes into the connecting-chamber 28 and thereafter through its attached pipe 29 to the receiver or storage-tank under the car. (Not shown.) Chamber 28 is attached to each cylinder 5 6 by bolts 30 through lugs 31 of the chamber and into lugs 32 of the cylinders. Plugs 33 are screwed into chamber 28 above valves 26 and serve to limit the lift or movement of the valves, as well as also to afford a means for placing or removing the valves. A safety-valve 34, which may be of any suitable construction, is placed upon chamber 28 and limits the amount of pressure. A pipe 35 also leads from the chamber to the governor-cylinder, more fully described hereinafter.

At the center of the piston 7 and extending transversely through it is a shaft 36, which is a portion of the piston's operative mechanism, later more fully set forth.

Upon axle 1 within wheel 37 is placed an eccentric formed by a minor part 38 and a major part 39, locked together at 40 41, held to each other by bolts 42, having overlapping side flanges *a* on part 39 to resist any tendency to part the adjoining parts by lateral thrusts, and a dowel-pin 43, which is let into axle 1 and minor part 38 and by means of which the axle revolves the eccentric. Around the eccentric is a strap formed by a back part 44, having an oil-reservoir 45 and a front part 46, held to the part 44 by bolts 47 in lugs 48 49. An oil-reservoir 50 is in part 46, having a cover 51, held by a spring 52. Eccentric-rods 53 54 are attached to strap 46, they being pocketed into opposite sides of the projection 55 and having inwardly-turned hooked ends 56 57, all being held in place by rivets 58. By employing the rectangular section-rods 53 54 and placing them on edge I gain requisite strength to transmit the eccentric's motion and power and at the same time secure a lateral flexibility which permits the axle and its attached eccentric to have their necessary transverse movements, which movements are not transmitted to the parts secured to the truck-frame and worked by the eccentric and its rods, and also by this mechanism the parts attached to the truck-frame are not affected by any vertical movement. Thus all parts of my mechanism move vertically or transversely with the part of the truck mechanism to which they are attached without imparting any disturbing effect in their working to parts otherwise moving and to which they are connected.

Upon the outer end of eccentric-rods 53 54 is a boss 59, having a bushing 60 and a backward projection 61, into which the eccentric-rods are seated with their inwardly-hooked ends 62 63 and secured by rivets 64. An oil-cup 65 is formed on boss 59 and a cover 66 is placed thereon.

At the end of truck-frame 2 a transverse angle-iron 67 is secured by bolts 68, and upon the angle-iron a bracket 69 is secured by bolts 68 70. The bracket extends upward, curves outward, and terminates in a boss or bearing 71, wherein is placed a shaft 72, held by set-screws 73. The shaft 72 extends beyond boss or bearing 71 at each end, and thereon are journaled bosses 74 75 of rocker 76 for swinging movement. Below boss 74 on rocker 76 is a boss 77, having a pin 78 secured therein and on which the eccentric-rod boss 59 is placed. At the opposite or cylinder end of rocker 76 is formed a curved arm 79, having an upper seat 80 and a lower seat 81. Forward of and opposite the cylinder side of curved arm 79 and somewhat removed therefrom is a curved bar 82, parallel to the curve of arm 79 and at its ends 83 84 turned to pass over the ends of arms 79 and thereafter still further turned to rest on seats 80 81, where the ends are secured by bolts 85, thus forming an open curved arm having a curved space or opening 86, wherein is placed a movable block 87 for vertical radial movement. A pin 88 passes through block 87, and flanges *b b* guide it sidewise. Radial connecting-rods 89 90 are placed and secured on pin 36, passing through piston 7 on each side of the piston, and at their opposite ends are secured to pin 88 of block 87 and at each side of the block, so that in the position shown in Fig. 1, the opening 86 being radial from the center of pin 36, the block would move down freely without imparting any motion to the piston 7 through rods 89 90. When the car and its truck are in motion, the eccentric will revolve around the axle, the rocker will be swung back and forth; but still there will be no motion imparted to the piston as long as the block 87 is at the pivotal point of the rocker, as shown in Fig. 1; but whenever block 87 descends in space 86 movement will be imparted to piston 7, and each cylinder will compress air, a full effect of compression being had when the block 87 is all the way down in space 86 and any less descent of the block compressing at a correspondingly less extent. As the eccentric revolves whenever the car or its truck moves, and as it is unnecessary to compress air all the time the car moves, and in order to reduce the wear of the cylinder parts as much as possible, I have introduced a governor-cylinder 91 (see details in Figs. 8, 9, 10) to automatically control the piston's movements and the act of compressing. Cylinder 91 is attached to frame 1 by means of a bracket 92. Within the cylinder is a piston 93, provided with a packing-seat 94, a flexible disk packing 95, and follower 96, secured by bolt 97. At the top of piston 93 is secured a separate seat 98 by bolt 99.

Passing through cylinder-bracket 3 is a cross-shaft 100, reaching across beyond the cylinder at each side far enough to receive at each end lifter-arms 101 102, which are securely fastened on the shaft and move in uni-

son. They pass diagonally upward clear of the cylinder, with the lower edge of arm 101 resting on the curved surface 103 on seat 98, while the upward projection 104 on seat 98 secures the arms sidewise, and pin 105 over arm 101 secures their movement with seat 98 and piston 93. At the outer ends of arms 101 102 are secured rollers 106 107 on bolts 108, the rollers going under and supporting the radial connecting-rods 89 90. Pipe 35 is attached to chamber 28 and to the governor-cylinder 91 and permits whatever pressure the chamber is charged with to enter space 109 under piston 93 to force it and the attached and cooperating parts upward or upon a decrease of pressure permit them to descend by their own gravity. As illustrated, the chamber 28 and the receiver (not shown) are carrying their maximum allowed pressure, and piston 93 of the governor-cylinder 91 is pressing up arms 101 102 and forcing radial arms 89 90 to place block 87 at the top of space 86 into its position of inactivity to stop piston 7 and cease compressing. When the pressure in the receiver decreases, the force under piston 93 will decrease, allowing all of the supported parts to descend by their own gravity, and thus allow motion to be imparted to the piston 7, which will again commence to work to gain the maximum pressure. With every drop in pressure in the receiver the compressing will again take place, the movement of the pistons being graduated by the pressure in the governor-cylinder, the whole power of compressing being exerted when the block 87 is at the bottom of space 86. If at any time it is desired to have continuous compressing, screw 110 can be turned in to cut off the admission of pressure under piston 93, when block 87 will remain at the bottom of space or slot 86, when the piston will continuously work.

As a further illustration of the operation of my invention it must be understood that when no pressure exists to elevate block 87 it will by the force of gravity descend to the bottom end of slot 86 and the pistons will have their full movement imparted to them by the eccentric. As it is impossible to at once accumulate full pressure in the receiver and the chamber 28, pipe 35, and the space in the governor-cylinder 91 under its piston 93, which is the means to elevate block 87 toward the pivotal center of the rocker-arm or to inactivity, and as the pressure is of necessity accumulated by degrees or in intervals of time it necessarily follows that the elevation of block 87 is accomplished in degrees or stages or little by little until full or maximum pressure is reached. The movement of the pistons is graduated by the position of block 87, which is elevated not all at once, but gradually as pressure accumulates. With a maximum accumulation of pressure in the receiver the application of the brake will decrease the pressure—say, for example, the pressure is reduced one-half—then the block 87 will descend one-half of the distance to its position at zero pressure, and the corresponding half-movements of the pistons will take place. This will also correspondingly result with any other corresponding decrease of maximum pressure or increase from zero pressure. The reason that the block 87 is elevated gradually as the pressure in the reservoir increases is that as the said block is elevated the point of application of the power by which it is elevated shifts gradually toward the fulcrum of the lever by which the block is raised. Consequently a gradual increase of pressure is required in the reservoir to raise the block to its limit.

Any system of brake-beams with their levers, cylinders, piping, and storage tank or receiver and starting and stopping valve, which is adapted to be placed on the car, may be used in connection with my brake.

I claim—

1. In an air-brake compressor, plural tandem cylinders for compression, and supported upon a truck-frame, a piston within each cylinder, an eccentric fixed upon the truck-axle, means to connect the eccentrics to the pistons at a point between the tandem cylinders and in manner to graduate the movement of the pistons according to an increase or decrease of pressure and to stop the pistons irrespective of the movement of the eccentric when they have compressed a maximum fixed pressure, and to put the pistons into operative action when a decrease of pressure takes place.

2. In combination with a truck-frame and its axle, tandem compression-cylinders and pistons therein, an eccentric upon the axle, means to connect the eccentric and the pistons at a point between the cylinders, and means to graduate the movement of the pistons by the eccentric, means to stop the pistons at a fixed and predetermined accumulation of pressure created by the action of said pistons while the eccentric is still in motion, and until a drop in the pressure takes place, at which time the means aforesaid will again put the pistons into operative action.

3. In a fluid-pressure compressor, a truck-frame and a truck-axle, multiple tandem compressor-cylinders supported upon the truck-frame, pistons in the cylinders, an eccentric upon the axle, a rocker worked by the eccentric, a radial arm upon the rocker, means to connect the radial arm to the pistons between the cylinders, and means to vary the position of the connection on the radial arm and thereby the amount of movement of the pistons in the cylinders.

4. In a brake-compressor, a truck-frame, a truck-axle, tandem compressor-cylinders and pistons therein, means to drive the pistons from the axle, and means controlled by fluid-pressure to limit the pistons' movements in accordance with a variation in pressure.

5. In a brake-compressor, a truck-frame, a truck-axle, tandem compressor-cylinders upon the truck-frame, pistons in the cylinders, driving means upon the axle, connections from the axle-driving means to the pistons, for their movement, governor means controlled by the pressure created by the pistons and whereby they are put out of action upon the pressure reaching a maximum allowance, and less activity as the maximum pressure is approached, said governor means being actuated by gravity to place the piston-driving means into full activity or to a less degree according to the degree of lessened pressure.

6. In an air-brake, a truck-frame, an axle, tandem cylinders mounted upon the truck-frame, a piston within the cylinders, an eccentric on the axle, a rocker pivotally suspended upon the truck-frame, a fixed connection from the eccentric to the rocker, a shifting connection from the rocker to the piston, and means therewith operative whereby the position of the connection attachment may be changed at the rocker end and the movement of the piston may be varied by the accumulated pressure.

7. In an air-brake compressor, a truck-frame, an axle, tandem single-acting air-compressing cylinders fixed upon the truck-frame, an eccentric fixed upon and driven by the axle, a rocker pivotally supported at its upper part for swing motion, and upon the frame, a strap upon the eccentric and therefrom means to engage the rocker aforesaid, a radial arm upon the rocker, a shifting block engaging the radial arm, connections from the block to the piston aforesaid, and pressure-controlled means to move the block toward or from the rocker's point of suspension.

8. In an air-brake compressor, an axle, a truck-frame, tandem single-acting compressor-cylinders supported upon the frame, and spaced and secured apart, a piston common to both cylinders; a divided eccentric upon the axle, a strap upon the eccentric double rods secured to the strap and having a boss secured to their outer ends; a rocker pivotally supported upon the frame and having means at one end to connect to the eccentric, an open-spaced radial arm at the opposite end of the rocker, a shifting block in the space, means to connect the shifting block to the piston aforesaid, and between the adjacent ends of the cylinders, and means to shift the block in the space wherein it is placed and thereby govern the amount of movement of the piston within the cylinders.

9. In an air-brake compressor, a truck-frame, tandem single-acting cylinders thereon, a piston within the cylinders, inlet and outlet valves for the cylinders, a chamber connected to the outlet-valves, and means therefrom to connect with a receiver; an axle, a divided eccentric thereon, secured to revolve with the axle, a strap on the eccentric, double rectangular section-rods secured to the strap and having a journal-boss similarly secured to their outer ends; a rocker pivotally suspended to the truck-frame, an arm on the rocker having means to engage the eccentric-rod journal-boss; a radial and open-spaced arm on the rocker, a block adapted to move within the open space, double rods connected thereto at one end and at their other end to the piston aforesaid; a governor-cylinder, a piston within the cylinder, a connection for fluid flowing from the chamber to the cylinder, below its piston, and means operated by the piston to regulate the block in position in the open arm to an operative position by the gravity of the piston and its attached and co-operative parts, and into an inoperative position by pressure under the piston aforesaid.

In testimony whereof I affix my signature in presence of two witnesses.

LOUIS T. PYOTT.

Witnesses:
R. C. WRIGHT,
WILLIAM C. STOEVER.