F. SIMONS.

BELL RINGER.

APPLICATION FILED SEPT. 24, 1909.

961,544. Patented June 14, 1910.

3 SHEETS—SHEET 1.

FIG. 2.

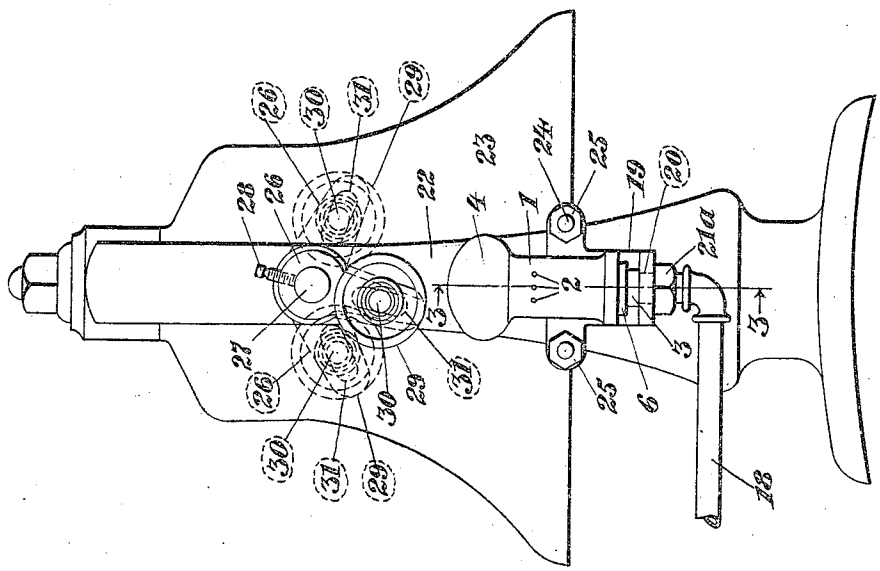
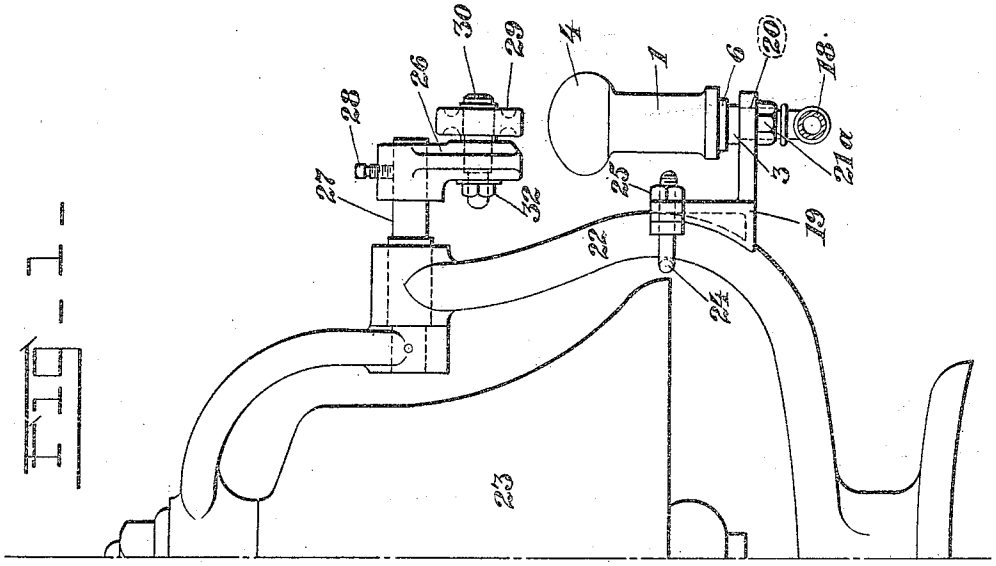


FIG. 1.



Witnesses:

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3 SHEETS—SHEET 2.

Fig. 3.

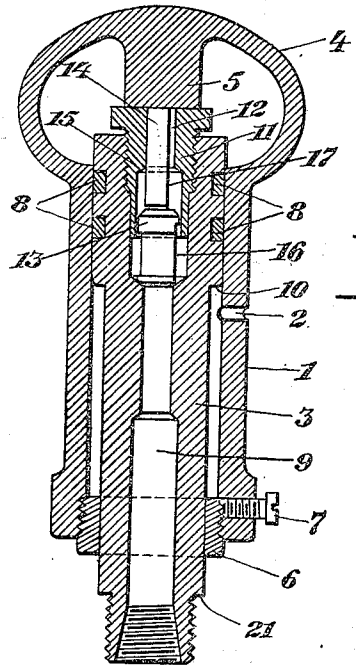


Fig. 4.

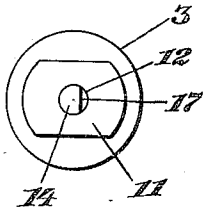


Fig. 6.

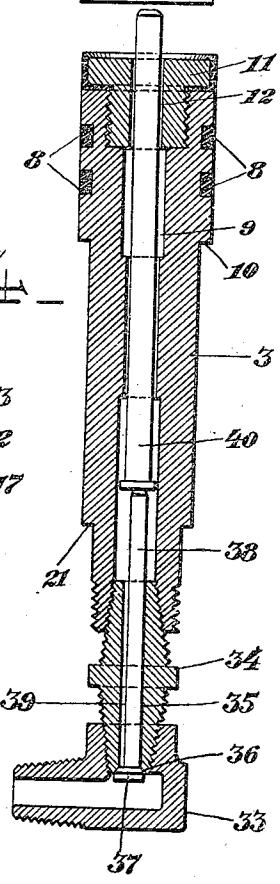
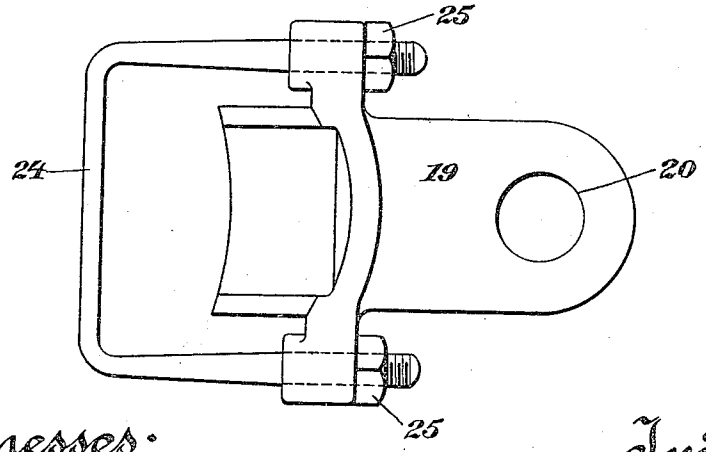


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 7.

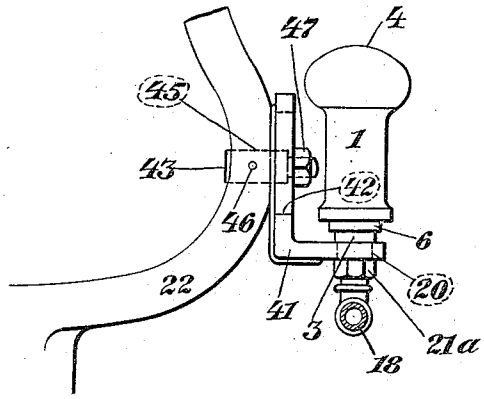


Fig. 8.

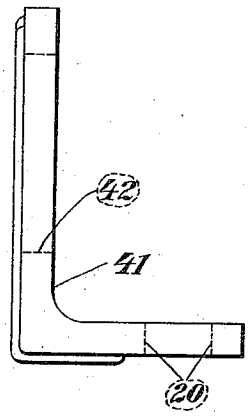


Fig. 9.

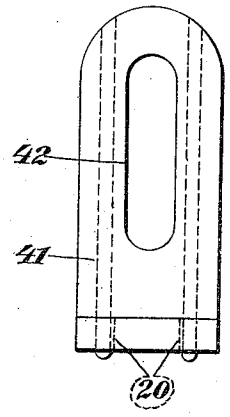


Fig. 10.

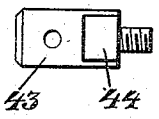


Fig. 11.

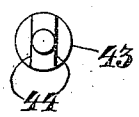


Fig. 12.

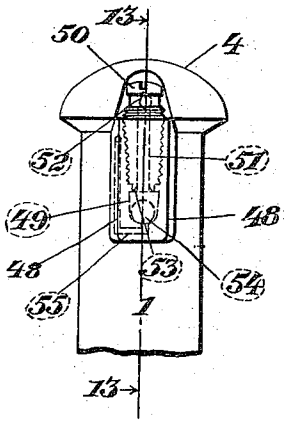


Fig. 14.

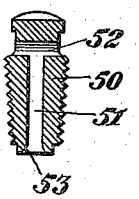
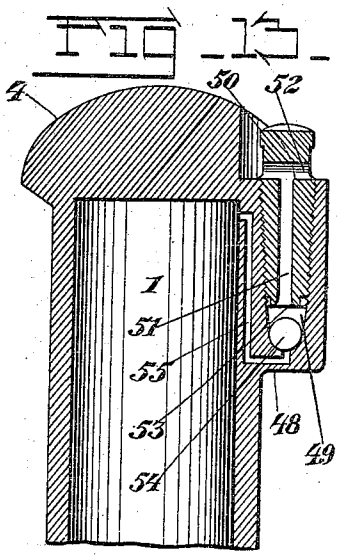


Fig. 13.



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UNITED STATES PATENT OFFICE.

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BELL-RINGER.

961,544. Specification of Letters Patent. Patented June 14, 1910.

Application filed September 24, 1909. Serial No. 519,304.

To all whom it may concern:

Be it known that I, FRANK SIMONS, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Bell-Ringers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in pressure bell ringers and has for its object to provide simple and efficient means for automatically starting and continually ringing any bell to which it may be attached, and is particularly adapted for use upon locomotives, fire engines, ships, and at light houses. The mechanism involved may, also, be successfully employed to actuate whistle valves and other similar contrivances.

In the drawings forming part of this specification, in which like numbers of reference denote like parts wherever they occur, Figure 1 is a view in full elevation, illustrating the device attached to the bell frame of a locomotive; Fig. 2 is a side view of same; Fig. 3 is a sectional view, on the line 3—3, Fig. 2; Fig. 4 is a top plan view of the piston, the cylinder being removed; Fig. 5 is a top plan view on an enlarged scale of the adjustable and detachable bracket which retains the ringing device upon the bell frame; Fig. 6 is a longitudinal sectional view through an alternate form of piston, the cylinder as illustrated in Fig. 3, being removed; Fig. 7 is a side elevation of an alternate form of the adjustable and detachable bracket; Figs. 8 and 9 are detailed views of the bracket shown in Fig. 7; Figs. 10 and 11 are detailed views of the pin which holds the adjustable bracket, depicted in Fig. 7, upon the bell frame; Fig. 12 is a side elevation of the cylinder having an alternate form of exhaust port; Fig. 13 is a sectional view on the line 13—13, Fig. 12; and Fig. 14 is a longitudinal sectional view through the plug shown in Figs. 12 and 13.

The cylinder 1 is provided with the exhaust ports 2 and is adapted to reciprocatively slide upon the piston 3. One end of said cylinder is closed by dome 4, which is exteriorly rounded, and said rounded end forms the interior chamber into which protrudes the projection 5, and the other end of said cylinder is threaded to receive the sliding or guide-nut 6, which is fastened to said cylinder by the set-screw 7 and is adapted to slide upon said piston.

The piston 3 is provided with ordinary packing rings 8 and with the passage 9 through which motive fluid is admitted into cylinder 1. The shoulder 10, which is formed as a peripheral enlargement of said piston, limits the upward movement of cylinder 1. The valve casing 11 is fitted into the upper end of passage 9 and is provided with the aperture 12, which communicates with said passage and with the interior of dome 4.

The valve 13 is provided with the stem 14, which is adapted reciprocatively to operate in aperture 12, and is adapted to engage the seat 15 in said aperture, thereby controlling the admission of motive fluid into the interior of dome 4. The flattened portions 16 and 17 are formed on valve 13 and stem 14, respectively, and allow the motive fluid to enter dome 4 from passage 9 when said valve is not in engagement with seat 15. The valve 13 normally occupies the position depicted in Fig. 3, but, when it is raised by the pressure of the motive fluid, the stem 14 protrudes above the valve casing 11 into the path of movement of projection 5 in the interior of dome 4. The motive fluid is conducted to the passage 9 through pipe 18, which on a locomotive would be connected with the boiler and the admission of the motive fluid into said passage would be governed by a valve in the cab of the locomotive (not shown in the drawings).

The bracket 19 is provided with an opening 20 over which rests the shoulder 21 of the piston 3 and under which said piston is fastened to said bracket by the nut 21^a. The bracket 19 is fastened to the frame 22 of the bell 23 by the U-bolt or clamp 24 and the nuts 25, which, when loosened on said bolt, permit said brackets to be raised or lowered as may be desired.

The crank 26 is fastened to the gudgeon 27 of bell 23 by the set-screw 28. Roller 29 is rotatably mounted on the pin 30, which is fastened in slot 31 in crank 26 by the nut 32 and is capable of adjustment therein, whereby the length of the rock-arm can be lengthened or shortened. Said crank 26 is fastened to gudgeon 27 in such position above the rounded top 4 of cylinder 1 as to cause roller 29 to be disposed in the path of movement of said rounded top and to be engaged and raised thereby.

In the alternate form of the piston illustrated in Fig. 6 the cylinder, being substan-

tially the same as shown in Fig. 3, is not depicted. The angle fitting 33 can be advantageously used in some cases, and this is connected to the piston 3 by the two-way coupling 34, which is provided with the aperture 35. The valve-seat in this form is located at 36 and is adapted to engage valve 37 when same is raised by the motive fluid to the position as shown in Fig. 6. The valve-stem 38 is formed with the flat side 39, which allows the motive fluid to pass through aperture 35 and into passage 9 when the valve 37 is not in engagement with its seat 36. The plunger 40 is adapted reciprocatively to operate in the passage 9 and in aperture 12 and is of such diameter as to allow the motive fluid to pass through said passage 9 and said aperture 12 and into dome 4. Said plunger rests on the valve-stem 38 and, when raised thereby to the position illustrated in Fig. 6, the upper end of said plunger projects into the path of movement of projection 5 within dome 4.

In Fig. 7 is depicted an alternate form of bracket 41, which is provided with the slot 42. A pin 43 having the flattened portions 44 fits in an opening 45 in the bell frame 22 and is secured therein by the pin 46. The flattened portions 44 of pin 43 fit closely to the sides of slot 42 and prevent the turning of bracket 41 which is held to said pin 43 by the nut 47.

The alternate form of exhaust port, illustrated in Figs. 12 and 13, acts as a relief chamber for cylinder 1. In this form the cylinder 1 is provided with an enlarged portion 48 in which the opening 49 is formed and screw-threaded to receive the plug 50. Aperture 51 in said plug terminates at its upper end in aperture 52, which communicates with the atmosphere outside of cylinder 1 and the lower end of said aperture 51 is adapted to form the seat 53 for the ball 54. The exhaust passage 55 extends from a point near the top of the interior of cylinder 1 to the bottom of opening 49. The projection 5 is omitted entirely and the interior of cylinder 1 formed as shown in Fig. 13.

The operation of the device is as follows: Steam, compressed air, or other motive fluid is admitted into passage 9 from the source of power, thence expands upwardly through aperture 12 and into the interior chamber of the rounded top 4 where it exerts its force thereagainst forcing cylinder 1 upwardly on piston 3. This upward movement of cylinder 1 causes the rounded top 4 to engage roller 29, which rides thereon and forces the crank 26 to one side or the other, thereby rocking gudgeon 27 and ringing bell 23. When the cylinder 1 has reached the limit of its upward stroke, *i. e.*, when nut 6 has been moved to engagement with shoulder 10, the ports 2 occupy a position above the top of piston 3. The motive fluid in the dome 4 being allowed to exhaust through ports 2, the supply of motive fluid in the passage 9 is permitted by the clearance of said dome to rush with added force into the interior of dome 4 and cause the valve 13 to engage seat 15, whereby the admission of said motive fluid into said dome is cut off and the stem 14 is forced upwardly into the interior of said dome. The release of pressure by the seating of the valve 13 upon the seat 15 of the motive fluid in the interior of the dome 4 allows cylinder 1 to descend under the pressure of roller 29, which is forced downwardly by the bell 23 returning to its normal position. This descent of cylinder 1 causes projection 5 to engage the end of stem 14 and to push same downwardly, whereby valve 13 is moved from engagement with its seat 15 and motive fluid is again allowed to enter the interior of the rounded top 4. The momentum acquired by the bell 23 in returning forces roller 29 to rotate to the opposite side of the center of the rounded top 4. Simultaneously with the passing of roller 29 to the opposite side of the center of the rounded top 4, the motive fluid which has entered the interior of said rounded top forces cylinder 1 upwardly. Roller 29 again rides on the rounded top 4, but on the opposite side thereof, and rotates crank 26 and gudgeon 27 in the opposite direction, thereby ringing bell 23. Valve 13 is closed as before, when the cylinder 1 reaches the end of its upward stroke, and allows the bell 23 to return causing roller 29 to force cylinder 1 downwardly. Roller 29 is carried over the center of the rounded top 4, the valve 13 is reopened, and the cycle is repeated until the motive fluid is shut off. When motive fluid is admitted into cylinder 1 having the alternate form of exhaust port, the ball 54 is forced against seat 53 and the motive fluid exerts its pressure against the interior of the head of said cylinder which is forced upwardly thereby until it reaches the end of its upward stroke where the pressure of the motive fluid in said cylinder is cut off. The ball 54 then drops from engagement with seat 53 and allows the motive fluid in the interior of said cylinder to exhaust when roller 29 forces said cylinder downwardly. The motive fluid remaining in the interior of cylinder 1 is compressed by the downward movement of said cylinder and is forced into passage 55 from which it exhausts through aperture 51. To facilitate the starting of the bell automatically, the crank 26 is secured in such position to the gudgeon 27 as to cause roller 29 normally to occupy a position on one side of the center of dome 4, whereby said roller is caused to ride readily on said dome and said crank forced to one side thereby, thus obviating the necessity of using a bell rope to start the bell ringing. Cylinder 1, also, can be ad-

justed relative to roller 29 in order to cause dome 4 normally to occupy a position below said roller but at a distance therefrom, and, when motive fluid is introduced into dome 4, said cylinder is set in motion before engaging said roller thereby causing dome 4 to impact said roller which is forced to one side or the other.

I claim:

1. In a bell ringing device the combination of a bell, a frame, a detachable and adjustable swinging member upon the axle or gudgeon of the bell frame, a rolling member detachably secured to said swinging member, a domed cylinder reciprocatively acting upon a stationary valve-body, said dome of said cylinder acting directly against the outer periphery of said rolling member, a reciprocating valve incased in said valve-body, the reciprocating members of said valve having means to permit the entrance of motive fluid into the dome chamber of said cylinder, means for automatically shutting off the flow of motive fluid into said dome chamber, means for automatically reopening said valve, and adjustable and detachable means for altering the relative position of said rolling member to said dome cylinder.

2. In a bell ringing device the combination of a bell, a frame, an axle or gudgeon connected to said frame, a detachable and adjustable swinging member upon said axle or gudgeon, a rolling member detachably secured to said swinging member, a domed cylinder adapted to reciprocate upon a stationary piston and to engage said rolling member, a reciprocating valve incased in said piston, said reciprocating valve having a stem and an enlarged portion thereon, each of said stem and said enlarged portion being provided with a flattened portion to permit the entrance of the motive fluid into the dome chamber of said cylinder, said stem extending into said dome chamber and actuated by said dome of said cylinder, a valve seat, and said enlarged portion movable into and out of engagement with said seat.

3. A bell ringing device, comprising, in combination, a stationary tubular piston, a reciprocating valve mounted for axial movement in said tubular piston, a stem on said valve adapted to be projected beyond said piston, a cylinder casing having an exteriorly rounded dome closing its upper end slidably mounted on said piston, and adapted to be actuated by said stem when fluid pressure is exerted on said valve.

4. A bell ringing device, comprising, in combination, a stationary piston having a passage throughout its length, a cylinder casing slidable on said piston, an enlarged pressure dome surmounting said cylinder casing, and a valve longitudinally reciprocable in said continuous passage, said valve being operatively mounted to control the fluid pressure in said dome by coöperation of the fluid pressure with said cylinder casing.

5. A bell ringing device, comprising, in combination, a stationary tubular piston, a reciprocating valve mounted for axial movement in said tubular piston, a stem on said valve adapted to be projected beyond said piston, a cylinder casing slidable on said piston, and adapted to be actuated by said stem when fluid pressure is exerted on said valve.

6. A bell ringing device, comprising, in combination, a stationary tubular piston, a reciprocating valve mounted for axial movement in said tubular piston, a stem on said valve adapted to be projected beyond said piston, a cylinder casing slidable on said piston, and adapted to be actuated by said stem when fluid pressure is exerted on said valve, said valve and stem having means whereby, when said valve is raised, pressure fluid may also be introduced into said cylinder.

7. A bell ringing device, comprising, in combination, a stationary tubular piston, a reciprocating valve mounted for axial movement in said tubular piston, a cylindrical casing slidable on said piston and having its end closed adjacent said reciprocating valve, a stem mounted on said valve and bearing against said closed end of the casing, and said valve and stem being longitudinally grooved to afford communication between said closed end of the casing, and the lower end of the tubular piston when said valve is unseated.

8. A bell ringing device, comprising, in combination, a stationary tubular piston, a cylinder casing slidable on said tubular piston and having a dome-shaped top, said tubular piston having a valve chamber formed therein, a closure for said chamber threaded into the latter and having an axial opening in continuation of the opening in said tubular piston, a reciprocating valve located in said chamber, and adapted to seat against said closure, a stem formed on said valve and bearing against the top of said dome-shaped end of the casing, and said valve and stem being formed to permit the axial egress of pressure-fluid through said tubular piston to said dome-shaped end of the casing.

9. A bell ringing device, comprising, in combination, a tubular piston stationarily mounted, a valve chamber provided in the head of said piston, a valve in said chamber adapted to be opened by fluid pressure to control the pressure through said tubular piston, a cylindrical casing slidable on said piston and having the end adjacent said valve chamber closed, said casing also having an exhaust port formed in its periphery, said valve being adapted to permit intermittent access of fluid pressure to said closed

end of said cylinder, and to coöperate with said fluid pressure to elevate said casing on said piston, and said exhaust port being located to permit the exhaust of said fluid pressure from said closed end of the casing when said casing has reached the upper limit of its movement on said piston.

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

FRANK SIMONS.

Witnesses:
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GLADYS WALTON.