

(No Model.)

J. L. BAKER.  
BELL RINGER.

No. 470,096.

Patented Mar. 1, 1892.

Fig 1.

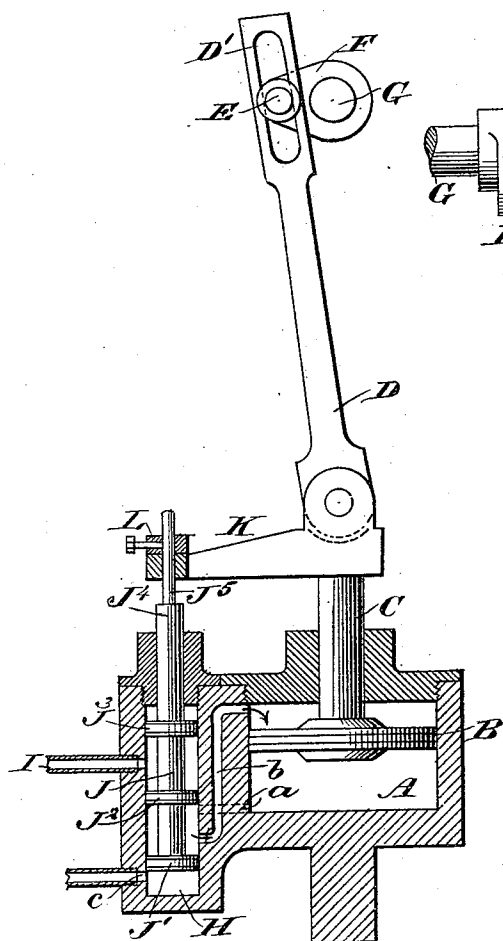


Fig 4.

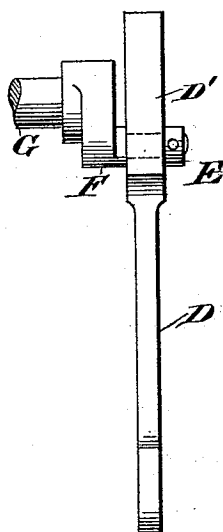


Fig 2.

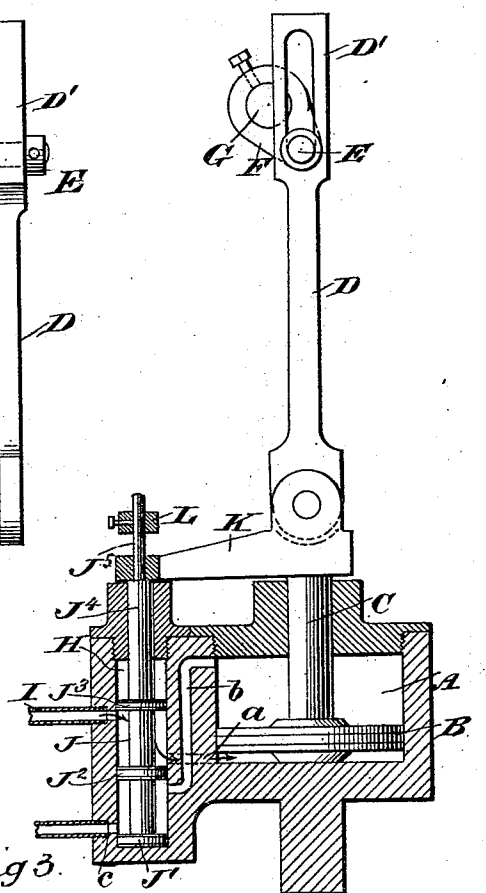
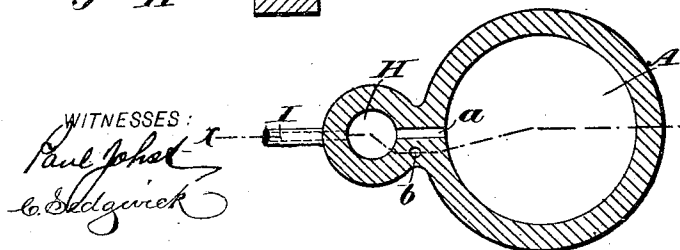


Fig 3.



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# UNITED STATES PATENT OFFICE.

JOHN L. BAKER, OF BAIRD, TEXAS.

## BELL-RINGER.

SPECIFICATION forming part of Letters Patent No. 470,096, dated March 1, 1892.

Application filed October 15, 1891. Serial No. 408,746. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN L. BAKER, of Baird, in the county of Callahan and State of Texas, have invented a new and Improved Bell-Ringer, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved bell-ringer more especially designed for use in locomotives, and which is simple and durable in construction, very effective and automatic in operation, and arranged to impart a uniform motion to the bell-crank shaft without jar or pounding.

The invention consists of a cylinder provided with a steam-chest and a plunger-valve held in the said steam-chest and formed with three plungers arranged to lead the motive agent from one end of the cylinder to the other end to form a cushion for the piston.

The invention also consists of certain parts and details and combinations of the same, which will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement, taken on the line *x x* in Fig. 3. Fig. 2 is a like view of the same in a different position. Fig. 3 is a sectional plan view of the cylinder and steam-chest, and Fig. 4 is an end elevation of the crank-shaft and pitman.

The improved bell-ringer is provided with a cylinder A, in which is fitted to slide a piston B, held on a piston-rod C, extending through a suitable stuffing-box in one end of the cylinder A. The outer end of the piston-rod C is pivotally connected with a pitman D, formed with a slotted head D', engaged by a wrist-pin E, held on the crank-arm F, secured on the shaft G, connected in the usual manner with the bell to be sounded. From the ends of the cylinder A lead the ports *a* and *b*, which connect the cylinder with the steam-chest H, provided with an inlet I, through which the motive agent can pass into the steam-chest H. In the latter is arranged a valve J, formed with three plungers J', J<sup>2</sup>, and J<sup>3</sup>, held on a stem J<sup>4</sup>, provided on its outer end with a reduced portion J<sup>5</sup>, engaging an

arm K, held on and projecting from the piston-rod C. A collar L, secured on the reduced portion J<sup>5</sup> of the valve-rod J<sup>4</sup> by means of a set-screw, serves to limit the loose traveling motion of the arm K on the reduced portion J<sup>5</sup>. The port *a* leads directly into the steam-chest H, while the port *b* extends along the wall of the cylinder A to pass into the steam-chest below the port *a*, as is plainly shown in Figs. 1 and 2, it being understood that the port *a* connects the lower end of the cylinder with the steam-chest H, while the port *b* connects the upper end with the steam-chest. From the steam-chest leads a port *c* to the outer air to exhaust the motive agent in the manner hereinafter more fully described. The port *c* opens into the steam-chest H at its lower end close to the entrance of the port *b* in the said steam-chest.

The operation is as follows: When the plunger-valve J is in the position shown in Fig. 2, the piston B is in its lowermost position and the plungers J<sup>2</sup> and J<sup>3</sup> extend between the inlet I and the port *a*, so that the motive agent entering the inlet I passes through part of the steam-chest H into the port *a*, and from the latter into the lower end of the cylinder to exert an upward pressure on the piston B. The port *b* opens into the steam-chest H between the plungers J<sup>2</sup> and J', between which also opens the exhaust-port *c*, so that the exhaust on top of the piston B can readily pass to the outer air at the upward stroke of the piston B. When the piston B moves upward, the pitman D acts on the crank-arm F to impart a turning motion to the shaft G to actuate the bell. When the piston B has traveled about two-thirds of its stroke, the arm K strikes the collar L, so that the valve J is carried upward to finally pass into the position shown in Fig. 1, so that the motive agent is shut off from the cylinder A by the port *a* opening between the plungers J<sup>2</sup> and J', as shown. At the same time the port *b* opens into the space between the plungers J' and J<sup>2</sup>, so that the motive agent contained in the lower end of the cylinder A can pass through the port *a* to the port *b*, and from the latter into the upper end of the cylinder A on top of the piston B to form a cushion for the latter. Thus the piston B will not strike directly against the head of

the cylinder, but is cushioned by the motive agent. The pitman D on the upstroke of the piston B imparts about an eighth-turn to the crank-arm F to cause the bell to swing to complete the revolution by its momentum, the crank-arm F being thus returned into its lowermost position, as shown in Fig. 2. The pitman D, as well as piston B and valve J, are also returned to their normal position and remain at rest until steam is again passed through the pipe I to the steam-chest H. On the downstroke of the piston B the lower end of the cylinder A is free from atmospheric pressure, as the communication between the cylinder and the atmosphere is cut off, as illustrated in Fig. 1. It will thus be seen that the motive agent is first used in the lower part of the cylinder to force the piston B upward, and is then utilized to form a cushion in the upper end of the cylinder to prevent the piston from striking the cylinder-head. Thus a smooth and even motion is given to the several parts, so that the entire device is free from any jar or pounding, whereby a uniform and regular motion is given to the bell.

The stroke of the piston can be regulated by adjusting the rod L so that the stroke of the valve J, which controls the stroke of the piston B, is regulated. As the plunger-valve J is counterbalanced, it operates easily without undue friction and pounding.

The device is very simple and durable in construction and not liable to get out of order.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a bell-ringer, the combination, with a cylinder formed with a steam-chest and provided with the ports *a*, *b*, and *c*, arranged as described, of a piston fitted to slide in the said cylinder and connected with the bell-shaft, and a plunger-valve held in the said steam-chest and provided with three plungers operating over the said ports, as described, the said valve being actuated from the piston-rod of the said piston, substantially as shown and described.

2. In a bell-ringer, the combination, with a cylinder provided with the ports *a*, *b*, and *c*,

arranged as described, and a steam-chest held on the said cylinder and provided with an inlet, of a piston fitted to slide in the said cylinder, a pitman connected with the piston-rod of the said piston and formed with a slot engaging the wrist-pin of the crank-arm for the bell-shaft, and a plunger-valve held to slide in the said steam-chest and actuated from the piston-rod, the said valve being formed with three plungers operating over the ports in the manner described.

3. In a bell-ringer, the combination, with a cylinder provided with the ports *a*, *b*, and *c*, arranged as described, of a steam-chest held on the said cylinder and provided with an inlet and a plunger-valve held in the said steam-chest and formed with three plungers arranged in the manner described, substantially as shown and described.

4. In a bell-ringer, the combination, with a cylinder provided with the ports *a*, *b*, and *c*, arranged as described, of a steam-chest held on the said cylinder and provided with an inlet, a plunger-valve held in the said steam-chest and formed with three plungers arranged in the manner described, a piston fitted to slide in the said cylinder, and an arm held on the piston-rod of the said piston and engaging a reduced portion of the valve-rod of the said plunger-valve, substantially as shown and described.

5. In a bell-ringer, the combination, with a cylinder provided with the ports *a*, *b*, and *c*, arranged as described, of a steam-chest held on the said cylinder and provided with an inlet, a plunger-valve held in the said steam-chest and formed with three plungers arranged in the manner described, a piston fitted to slide in the said cylinder, an arm held on the piston-rod of the said piston and engaging a reduced portion of the valve-rod of the said plunger-valve, and an adjustable collar held on the reduced portion of the valve-rod, substantially as shown and described.

JOHN L. BAKER.

Witnesses:

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