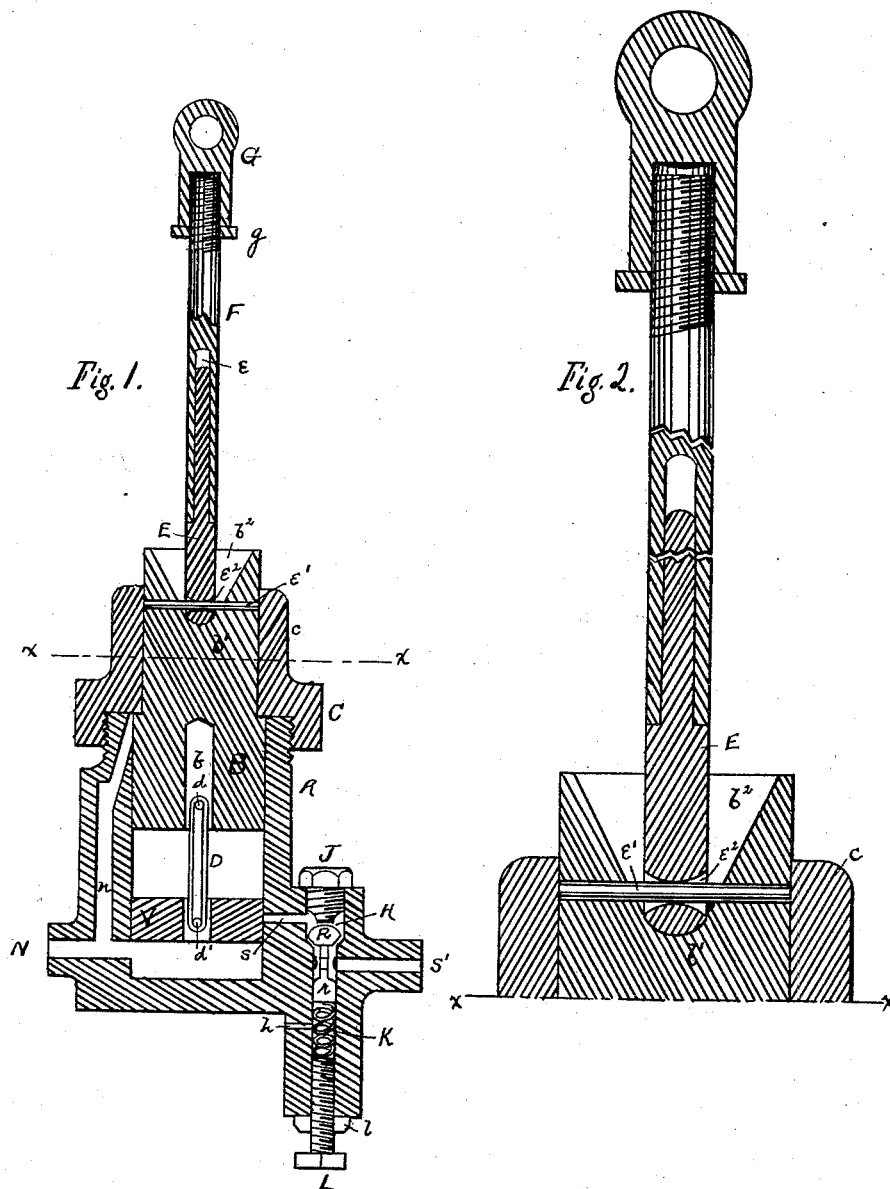


(No Model.)

G. B. SNOW.  
STEAM BELL RINGER.

No. 385,580.

Patented July 3, 1888.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

GEORGE B. SNOW, OF BUFFALO, NEW YORK.

## STEAM BELL-RINGER.

SPECIFICATION forming part of Letters Patent No. 385,580, dated July 3, 1888.

Application filed September 1, 1884. Serial No. 141,887. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE B. SNOW, of the city of Buffalo and State of New York, have invented certain Improvements in Steam Bell-Ringers, of which the following is a specification.

This invention relates to that class of steam bell-ringers in which the motor is a single-acting engine which is connected to and operates a bell suspended in a bell-yoke oscillating freely on bearings. Its object is to provide a form of cylinder and valve which will be free from the objection of leakage, which will be cheaply made and easily kept in repair, and which will afford full and complete drainage for water of condensation; to provide a universal joint between the piston and connecting-rod which will be more durable than the knuckle-joint which is commonly used, and which will avoid the cramping which is incident to the use of the knuckle-joint as the parts wear.

In the accompanying drawings, Figure 1 is a longitudinal section of a steam-cylinder and connecting-rod embodying my invention. Fig. 2 is an enlarged vertical section of the connecting-rod.

A is a single-acting steam-cylinder, having a steam-port, S, an exhaust-port, N, and a relief-passage, *n*, leading to and opening into the upper end of the cylinder. The exhaust-port opens into the cylinder at a point distant from its bottom about one-half the thickness of the valve V, so that the port N will be symmetrically covered by the valve when it is pushed to the bottom of the cylinder. The steam-port S opens into the cylinder at a distance equal to the thickness of the valve V from the cylinder-bottom, so that it will be uncovered as the port N is closed. The valve V is turned to accurately fit the bore of the cylinder, and has longitudinal motion therein, so as to alternately close and open the ports N S. It is longitudinally perforated to allow the contents of the cylinder, which may be above it, to escape through the exhaust-port N. The piston B and the valve V are so connected that the piston will pull the valve upward by means of the connection, but will not push it downward until it comes into direct contact with it, so that it will only operate the valve at the terminations

of its stroke. This may be accomplished in different ways. I show for this purpose the link D, which passes from a central perforation through the valve V into a central cavity, *b*, in the piston B, and is secured at either end by the transverse pins *d d'*, respectively. This connection allows the piston to approach the valve and come in contact with it, and the termination of the upward movement of the piston will raise the valve to the position shown in the drawings.

The piston B fits the bore of the cylinder as closely as is consistent with free longitudinal movement therein. Its upper part, *b'*, is shouldered down and an abutting surface thereby provided, so that the upward movement of the piston B will be arrested by contact of the shoulder with the cap C.

Packing-rings may be applied in the ordinary well-known manner to the piston B and the valve V, to assist in controlling leakage and to retain the parts in position.

The cylinder A is surmounted by a screw-cap, C, which affords a bearing for the extension *b'* of the piston B by means of the sleeve *c*. The upper end of the extension *b'* of the piston has the cup *b''* formed in it, which receives and is adapted to the hemispherical end of the connecting-rod E. A transverse pin, *e'*, secures the two parts together, the double-tapered hole *e''* permitting such an amount of lateral play that the connecting-rod will vibrate and follow the movements of the crank to which its upper end is attached without regard to the relative position of the cross-pin *e'* to the plane of motion of the crank. It will be seen that this arrangement of parts forms a universal joint, and that the piston B may turn completely around without cramping or interfering with the vibration of the connecting-rod, and that it is not necessary for any provision to be made to prevent the rod E *e* from turning in the sleeve F. The pin *e'* is relieved from strain and wear, which is brought upon the end of the rod E and the cup *b''*. A ball-and-socket joint would answer the purpose as well; but the arrangement of parts above described is cheaper, and therefore preferable. The connecting-rod E is shouldered into the extension *c*, which passes into and slides freely in the tube or sleeve F, upon the upper end of which

may be permanently fastened the crank-box G. I have shown the parts, however, as connected by means of a thread and jam-nut, *g*. This threaded connection between the sleeve  
 5 F and box G provides a convenient means for adjustment of the length of the rod.

The crank-box G receives the pin of a crank, which is attached to the yoke of a swinging bell in the usual manner, when single-acting  
 10 steam bell-ringers are employed. Steam being now admitted by means of the passage S, and the bell being in motion, the crank upon the bell-yoke will, as it comes to the center, force the piston B and valve V to the bottom of the  
 15 cylinder, uncovering the steam-port S. The piston will be driven upward and the valve raised, closing the steam and opening the exhaust ports, the bell meantime receiving an impulse which will cause it to continue its mo-  
 20 tion after the piston has reached the upper end of its stroke, the sleeve F sliding upon the rod *e*. The impetus which the bell receives being expended, it will fall, the end of the sleeve F will strike the shoulder of the rod *E e*, the  
 25 piston B and valve V will be forced downward,

opening the port S, steam will again enter and the piston again be driven upward, and this operation may continue indefinitely.

I claim as my invention—

1. In a steam bell-ringer, the combination of 30  
 a single-acting steam-cylinder having steam and exhaust ports, a piston having a central cavity, a valve having a perforation there-  
 through, transverse pins in the said cavity and  
 perforation, and a link loosely connecting the 35  
 piston and valve, substantially as described.

2. In a steam bell-ringer, the combination of  
 a connecting-rod consisting of a crank-box, a  
 sleeve sliding upon a guide-pin and abutting  
 against a shoulder on the guide-pin, a double- 40  
 tapered opening through the lower end of the  
 guide-pin, and a pin connecting said guide-pin  
 with the piston, with a valve having a central  
 perforation and a loose link-connection be-  
 45 tween said valve and the piston, substantially  
 as described.

GEORGE B. SNOW.

Witnesses:

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