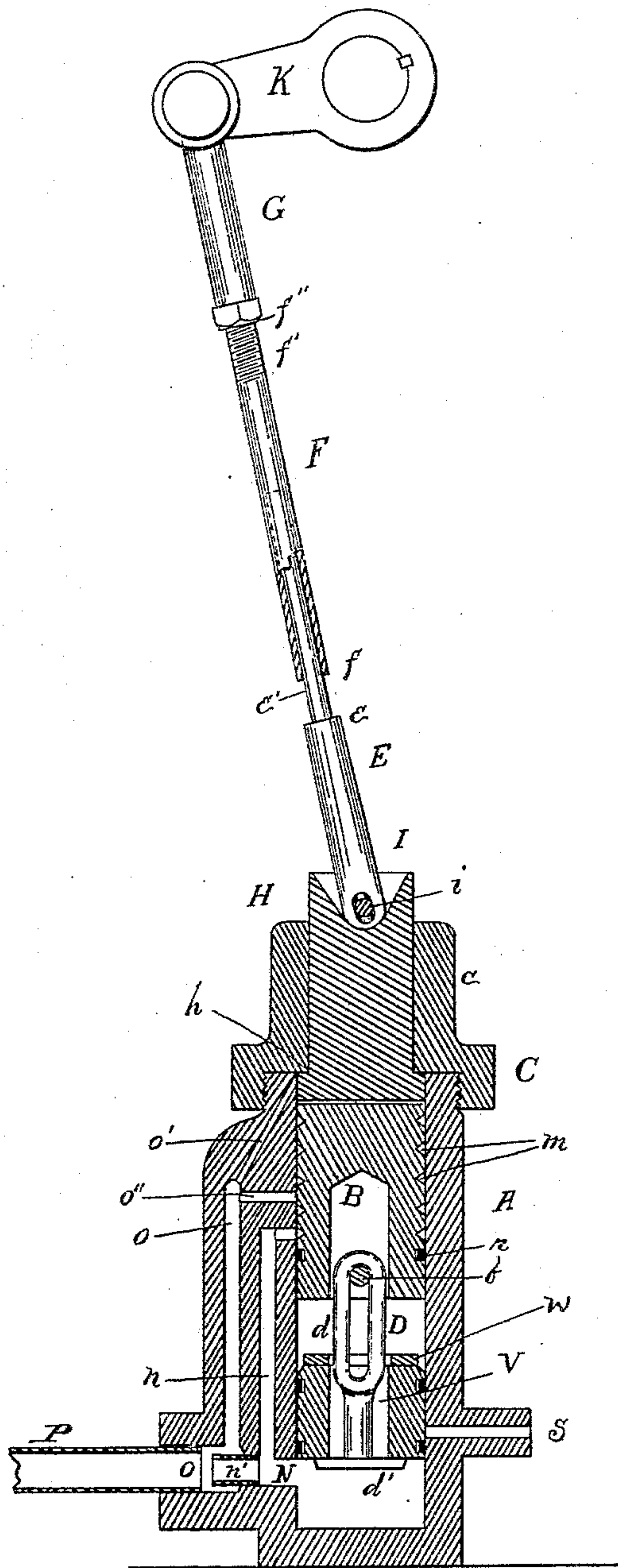


(No Model.)

G. B. SNOW.
STEAM BELL RINGER.

No. 388,736.

Patented Aug. 28, 1888.



Witnesses:

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GEORGE B. SNOW, OF BUFFALO, NEW YORK.

STEAM BELL-RINGER.

SPECIFICATION forming part of Letters Patent No. 388,736, dated August 28, 1888.

Application filed October 24, 1887. Serial No. 253,195. (No model.)

To all whom it may concern:

Be it known that I, GEORGE B. SNOW, of the city of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Steam Bell-Ringers, of which the following is a specification, reference being had to the accompanying drawing, which is a sectional view of a single-acting engine and connecting-rod embodying my invention.

This invention relates to single-acting steam-engines, especially to those adapted for ringing locomotive-bells.

I.—Its object is to prevent apparent leakage, either of water or steam, without resorting to the use of a stuffing-box.

II.—Its object is also to increase the durability of the cylinder and piston by throwing the wear upon other parts more easily replaced when worn.

III.—Its object is also to provide a secure and cheaply-made connection between the piston and valve, easily shipped and unshipped, and affording a ready means for adjusting the power of the engine to its work.

I.—In the accompanying drawing, A is the cylinder; B, the piston; V, the valve; S, the steam-port; N, the exhaust-port, and *n* a relief-passage leading to a point in the cylinder traversed by the lower end of the piston B. O is the exhaust-cavity; P, the exhaust-pipe leading therefrom; *o*, a relief-passage opening into the top of the cylinder-cavity at *o'*, and also at an intermediate point, *o''*, traversed by the upper end of the piston. The exhaust-port N is continued into the exhaust-cavity O by a nozzle, *n'*, which is in line with and smaller in diameter than the exhaust-pipe P. The piston B is shown as packed with a single ring, *r*, situated near its lower end and above the cross-pin *b*. The surface of the piston is grooved or scored at suitable intervals, as shown at *m*. Any steam which may pass the packing-ring *r* will be caught and held in the grooves or scores until said grooves or scores, by reason of the movement of the piston, shall register with the opening *o''* of the relief-passage, when such steam will enter the said passage, where it will join any leakage there may be from the valve V through the exhaust-port N, and will be expelled through the nozzle *n'*, the jet creating a current in the pipe P and par-

tially exhausting the chamber O and passages *o o'*, with the effect of drawing any steam or water which may be above the piston into the exhaust-pipe and preventing its appearance as leakage and causing annoyance.

II.—The cylinder A is surmounted by the screw-cap C, which is provided with a sleeve, *c*. The guide-block H fits the sleeve *c* and has vertical movement therein, a shoulder, *h*, being provided to limit its upward movement. Its lower end bears upon the upper end of the piston B, the two parts having no connection, except by contact. Its upper end has formed in it a cupped depression, I, which receives the lower hemispherical end of the connecting-rod E F G. This rod is made up of three sections, the lower end, E, having a shoulder, *e*, and a guide-pin, *e'*, made, as is usual, longer than the throw of the crank K and sliding in the sleeve F, which forms the middle section of the rod. The crank-box G is secured to the section F by a screw-thread and jam-nut, *f' f''*. The rod resembles those usually employed in locomotive bell-ringers in construction, excepting that the pin *e'* is round, allowing one part of the rod to turn upon the other, and that the lower end of the section E is rounded. To prevent cramping of the joint at the lower end of the rod if it should turn, it is fastened to the guide-block H by the transverse pin *i*, which passes through a double-tapered hole in the lower end, E, of the rod and allows the rod to be swung about in any direction. Inspection of the drawing will show that the lateral strain consequent upon the obliquity of the rod is received by the guide-block H and supported by the sleeve *c*, and will not be transmitted to the piston B, which will be wholly free from lateral pressure in the cylinder. There will therefore be no tendency for it to wear the cylinder oval, and these (the more costly) parts will last a long time, while the guide-block, upon which the wear is thrown, can be easily and cheaply renewed as occasion requires. As all steam and water are removed from the space in the cylinder above the piston by the peculiar arrangement of exhaust and relief passages, heretofore detailed, a very large amount of wear may take place in the guide-block H before its renewal becomes necessary.

III.—The piston B is connected to the valve

V by a link, D, and a cross-pin, *b*, which passes transversely through the piston below the packing-ring *b'*. It is evident that the pin *b* can give no trouble from leakage when thus placed, 5 even though it be loosely fitted, while it is impossible for it to get out of place while the piston is in the cylinder. The valve V is pushed downward by the pressure of the piston B upon it, and is pulled upward by the T-shaped foot 10 *d'*, forming the lower end of the link D. If it should become desirable to reduce the power of the engine, it can be done by interposing one or more washers, W, between the piston and valve. It will be seen that the valve can 15 be readily detached from the piston for this purpose. Afterward it will be necessary to shorten the connecting-rod, so as to allow the crank K to pass center. This is done by screwing the sleeve F into the crank-box G and securing it with the jam-nut *f'*. 20

Having thus fully described my device, I claim as my invention—

1. In a single-acting engine adapted for use as a motor for ringing bells, the combination, 25 with the cylinder and piston, of a relief-passage communicating with the space in the cylinder at one end, an exhaust-pipe at the opposite end portion of the cylinder, an exhaust-port and a nozzle of less diameter than the exhaust-pipe, 30 placing the said exhaust-port in communication with the exhaust-pipe to discharge the first leakage and produce a partial vacuum and withdraw the leakage around the piston, substantially as described.
2. In a single-acting engine adapted for use as a motor for ringing bells, the combination 35 of the piston, the cylinder having a relief-passage communicating with the space above the piston, and a port for the discharge of the exhaust at the opposite end of the piston, and 40 an exhaust-pipe communicating with the said

port by a passage, *u'*, of less diameter than the exhaust-pipe to produce a partial vacuum and withdraw the leakage around the piston, substantially as described. 45

3. In a single-acting engine adapted for use as a motor for ringing bells, the combination of a passage for removing exhaust-steam from below the piston and leakage from around it, and a relief-passage communicating with the 50 space in the cylinder above the piston, and also having a separate communication with the cylinder at an intermediate point traversed by the piston, both passages leading to a common exhaust-pipe, substantially as described. 55

4. In a single-acting engine adapted for ringing bells, the combination of a connecting-rod jointed to a guide-block with a grooved or scored piston, said grooves or scores being adapted to register with the relief-passage, said 60 piston operating with the guide-block by contact only, whereby lateral pressure of the piston upon the cylinder is avoided, substantially as set forth.

5. In a single acting engine adapted for ringing bells, the combination of the telescopic connecting-rod E F G, connected to the guide-block H by a universal joint, with a piston operated by contact with said guide-block, substantially as described. 70

6. In a single-acting engine adapted for ringing bells, the pin *b*, passing transversely through the piston B below its packing-ring, and thus placed wholly within the cylinder-cavity below the piston, in combination with 75 the link D, as a means for connecting the piston B and valve V, substantially as described.

GEORGE B. SNOW.

Witnesses:

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