H. W. GROSS.

AUTOMATIC BELL RINGING DEVICE.

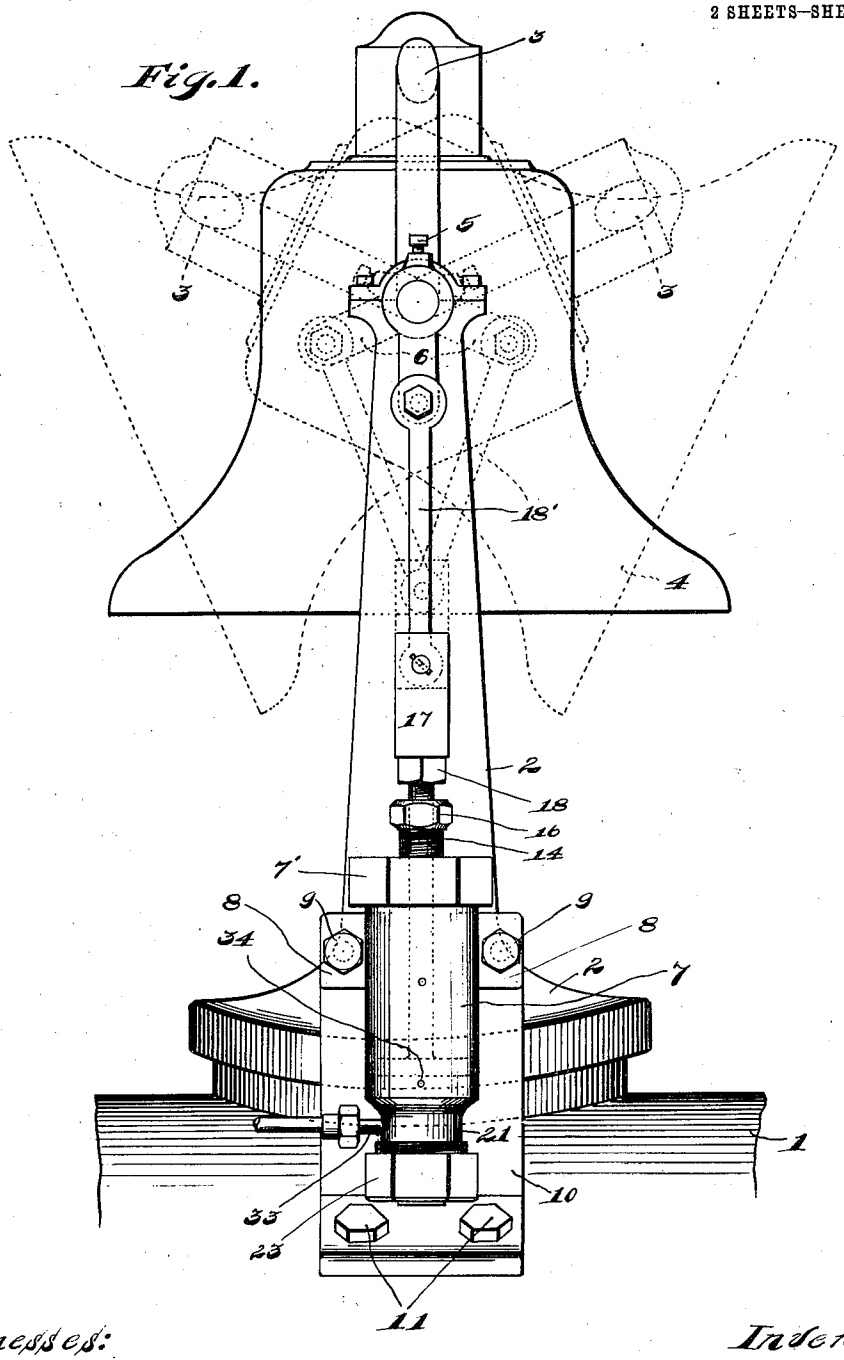
APPLICATION FILED AUG. 7, 1911.

1,046,775.

Patented Dec. 10, 1912.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

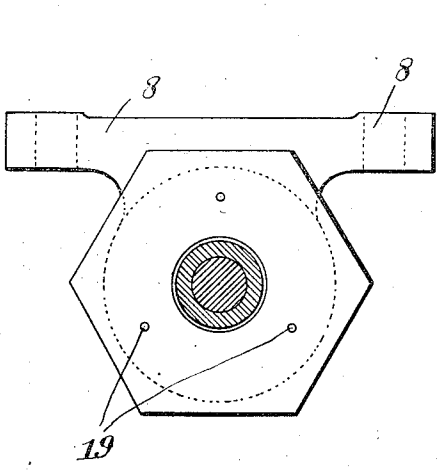

Fig. 4

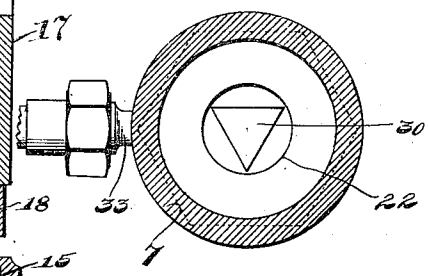

Fig. 3

Fig. 2.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC BELL-RINGING DEVICE.

1,046,775. Specification of Letters Patent. Patented Dec. 10, 1912.

Application filed August 7, 1911. Serial No. 642,784.

To all whom it may concern:

Be it known that I, HERSCHEL W. GROSS, a citizen of the United States, and a resident of the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Automatic Bell-Ringing Devices, of which the following is a specification.

My invention relates to devices for effecting automatic bell ringing, and more specifically to that class thereof designed especially for employment upon locomotives.

The object of my invention is the production of a device of the character mentioned which will be of improved construction and of great efficiency in operation.

Other objects will appear hereinafter.

With these objects in view my invention consists in the combinations and arrangements of parts hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawing forming a part of this specification, and in which,

Figure 1 is a side elevation of a bell ringing device embodying my invention, Fig. 2 is a central vertical section of the main operative parts of the device, Fig. 3 is a transverse section taken on line *x*—*x* of Fig. 2, and Fig. 4 is a transverse section taken on line *y*—*y* of Fig. 2.

The preferred form of construction as illustrated in the drawings comprises a portion 1 of a locomotive boiler upon which is mounted the bell bracket 2 in which is mounted for oscillation the bell support or hanger 3. The bell 4 is rigidly secured to the hanger 3 and is adapted to oscillate therewith. Secured to one extremity of the support or hanger 3 by means of a set screw 5 is a crank 6 through the medium of which said support and the bell 4 may be oscillated. Arranged adjacent the bracket 2 and disposed directly below the crank 6 is an upright cylinder 7, there being securing lugs 8 cast integral with said cylinder which are secured by means of screws 9 to a supporting bracket 10 which is approximately L-shaped in form and secured to the top of the boiler 1 by means of a pair of screws 11. Operating within the cylinder 7 is a piston 12 carried by a piston rod 13, said piston rod projecting through the upper head of said cylinder into an axial guide chamber 14 formed integral with said cylinder head. In order to prevent leakage past the piston rod 13 a packing gland 15 is provided and held in position by a cup 16 which is screwed upon the threaded periphery of the chamber 14. The upper end of the piston rod 13 is threaded and screwed into an internally threaded block 17 as shown in Fig. 2. In this manner an adjustable connection is formed between the piston rod 13 and the block 7, any desired adjustment being secured by means of a lock nut 18 disposed below the block 17. The crank 6 is operatively connected with the block 17 by means of a connecting rod 18′, the latter being suitably pivoted at each end thereof. The construction is such that reciprocation of the piston 12 and block 17 effects oscillation of the crank 6 and consequently the bell 4 which is arranged in rigid relation therewith. Provided in the head 7′ of the cylinder 7 is a plurality of perforations 19 by means of which the ingress and egress of air to and from the cylinder 7 is readily permitted.

In order to limit the upward movement of the piston rod 13 and the oscillation of the bell caused thereby a helical spring 20 surrounding said piston rod is interposed between the piston 12 and the head 7′, the length thereof being approximately as shown in Fig. 2. The spring 20 causes the piston 12 to stop gradually and precludes the possibility of any shock or noise. Also with this construction the bell 4 is prevented from making a complete rotation which is a very objectionable fault with bell ringers of ordinary construction. It is well known that with bell ringers as ordinarily constructed it is possible for the bell to be whirled or rotated at such a speed that operation of the hammer is prevented and hence a sounding of the bell also prevented, this not infrequently resulting in disaster. The lower end of the cylinder 7 is provided with an extension cylinder 21 there being a circular opening 22 between the main and extension cylinders. The periphery of the lower end of the extension cylinder 21 is threaded and screwed thereto is an internally threaded cup 23 by means of which a collar 24 and a packing gland 25 is rigidly secured in position as shown in Fig. 2. The collar 24 is seated against a shoulder 26 and serves as a seat for the lower end of a helical compression

spring 27 provided within the extension cylinder 21. The packing gland 25 together with the collar 24 effectually prevents loss of compression in both of the cylinders 7 and 21. Axially arranged in the cup 23 which is provided with a central opening is a cylindrical valve 28 having a conical valve head 29 at the upper end thereof. Formed integral with the valve 28 and extending upwardly therefrom through the opening 22 between the cylinders 7 and 21 is a triangular shaped stem 30 the upper surface of which serves to resist the downward movement of the piston 12 which is adapted to abut thereagainst as illustrated in Fig. 2. The valve 28 is mounted free to slide through the collar 24 and the central opening in the cup 25, consequently when the stem 30 comes into contact with the piston 12 in the downward movement thereof said valve is depressed gradually by the movement of said piston. This gradual opening is resisted by means of the helical spring 27 acting upon diametrically opposite radially projecting pins 31 provided at the upper end of the valve 28. The general construction and the calibration of the spring 27 is such that the piston 12 will come to a full stop before it reaches the lower end of the cylinder 7 as shown in Fig. 2. Simultaneously with the contact of the piston 12 with the valve 28 the valve head 29 is unseated from the valve seat 32, thus establishing communication between the two cylinders 7 and 21.

The extension cylinder 21 is connected with a source of compressed air or other fluid by means of a pipe 33 which is tapped into one side of the cylinder 21 as shown.

In operation when it is desired to operate the bell a valve (not shown) in the pipe 33 is opened which effects the delivery of the compressed fluid to the extension cylinder 21. The valve 28 being in the position as shown in Fig. 2 the fluid now contained within the cylinder 21 will flow through the opening 22 and exert an upward pressure upon the lower side of the piston 12. During the upward movement of the piston 12 the bell 4 will obviously be oscillated either in one direction or the other due to the connecting mechanism between said piston and the bell hanger 5. The bell 4 will be oscillated to such an extent that it will assume one of the dotted line positions as shown in Fig. 1 whereupon it will stop oscillating due to the contact of the compression spring 20 with the under side of the cylinder head 7', the stopping action being gradual as hereinbefore explained. After the piston 12 has moved upwardly a certain distance a port 34 which leads to atmosphere and provided in one side of the cylinder 7 is uncovered by said piston and permits the charge of compressed fluid acting thereon to escape. The piston 12 will not immediately stop, however, due to the momentum of the bell and the connecting medium, said piston continuing to move until stopped by the contact of the spring 20 with the head 7' as aforesaid. When the piston 12 begins to ascend the valve 28 follows the same until the valve head 29 is seated upon the valve seat 32, whereupon the supply of compressed fluid is cut off from the cylinder 7. The valve head 29 will not again open until the piston 12 descends following its upward movement and contacts with the stem 22. The valve head 29 will now be unseated since the piston 12 is returned by the gravity of the operating parts and the bell 4 which tends to assume the stable normal position as shown in Fig. 1. Since the piston 12 is now exposed to the pressure of the fluid contained within the cylinder 21 it will operate as before. In this manner the bell 4 will continue to oscillate and ring until the valve in the pipe 33 is closed.

The construction as set forth is simple and economical, hence may be manufactured at a low cost, and the same because of its simplicity is not susceptible to readily becoming inoperative. The parts are assembled for ready removal if desired to effect cleaning, the valve 28 for instance being adapted to be readily removed by removal of the cup 23. The adjustable connection between the block 17 and the piston rod 13 affords means for readily and gradually adjusting the throw or amplitude of oscillation of the crank 6 and hence the bell with which the same is connected. The parts of the construction are exceedingly strong and durable and are of high efficiency in operation.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I therefore do not wish to be limited to the precise details of construction as set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

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

1. In a locomotive bell ringer, a piston cylinder and an axially arranged cylinder extension, a piston in said piston cylinder; a valve stem in said cylinder extension; a partition between said piston cylinder and cylinder extension having a circular opening therein and provided with a valve seat formed adjacent said opening and within said cylinder extension, a portion of said valve stem being polygonal in cross section and projecting through said opening into the lower portion of said piston cylinder; a valve head on said valve stem adapted

to engage an annular valve seat; a helical spring on said piston adapted to limit the upward movement thereof; a helical spring on said valve stem adapted to hold the valve head normally closed; an exhaust port in the lower portion of said piston cylinder; means for supplying fluid under pressure to said cylinder extension; and an operative connection between said piston and the locomotive bell, substantially as described.

2. In a locomotive bell ringer, a cylinder having a piston and an axially arranged cylinder extension having a circular opening into the lower portion of said piston cylinder; a valve head in said chamber having a polygonal valve stem; a nut in said chamber and cylinder extension; a valve seat within said cylinder extension and surrounding said opening, said valve stem passing through said opening and into the lower portion of said piston cylinder, and said valve head being provided with lugs; a helical spring on said valve head and in engagement with said lugs; a collar surrounding said valve head and adapted to receive pressure from said spring; means for admitting fluid pressure to said cylinder extension, a helical spring within said piston cylinder adapted to limit the upward movement thereof; an exhaust port in said piston cylinder; and an adjustable operative connection between said piston and the locomotive bell, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HERSCHEL W. GROSS.

Witnesses:
JOSHUA R. H. POTTS,
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