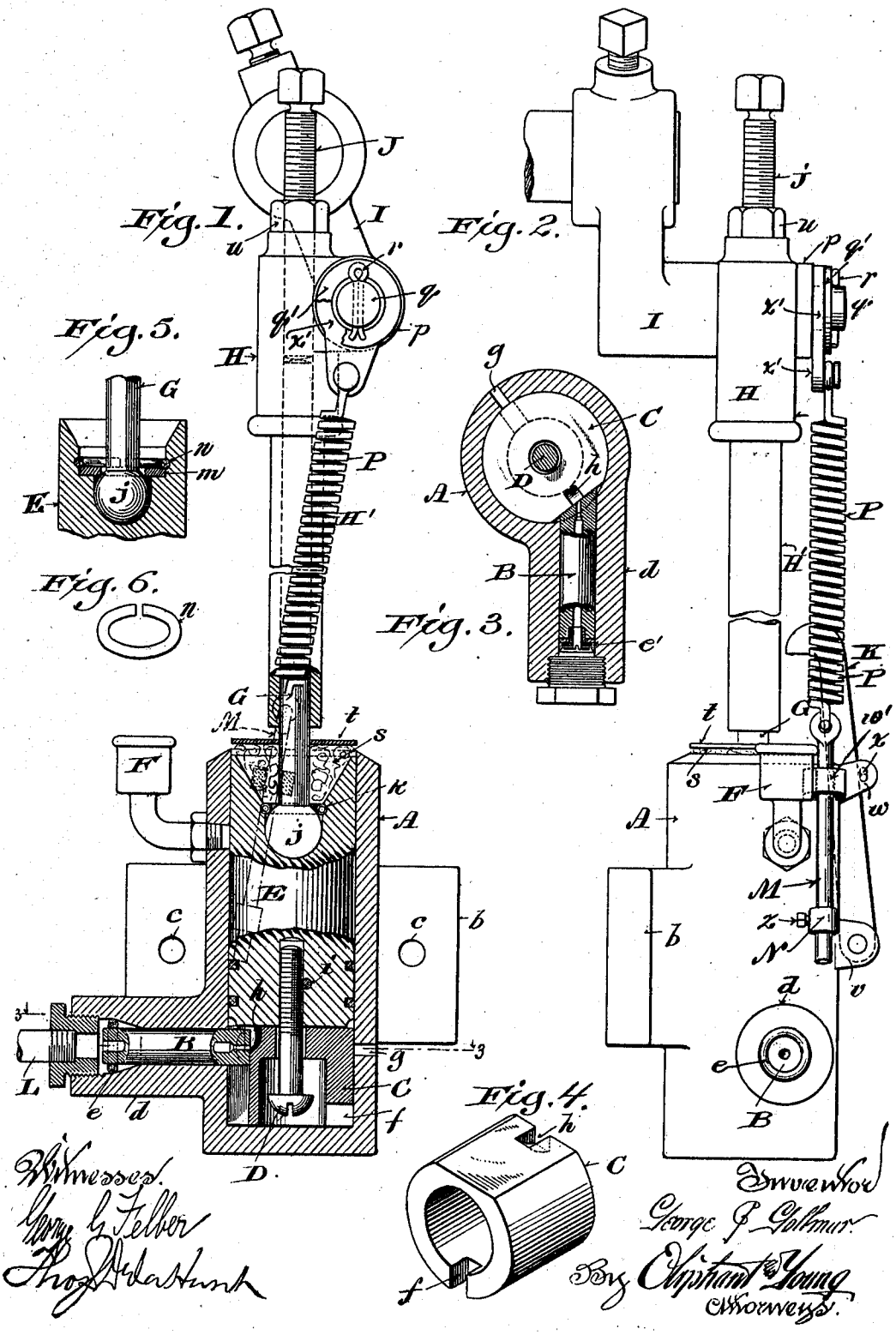
G. J. GOLLMAR.

MECHANICAL BELL RINGER.

APPLICATION FILED APR. 26, 1909.

970,703. **Patented Sept. 20, 1910.**

2 SHEETS—SHEET 1.



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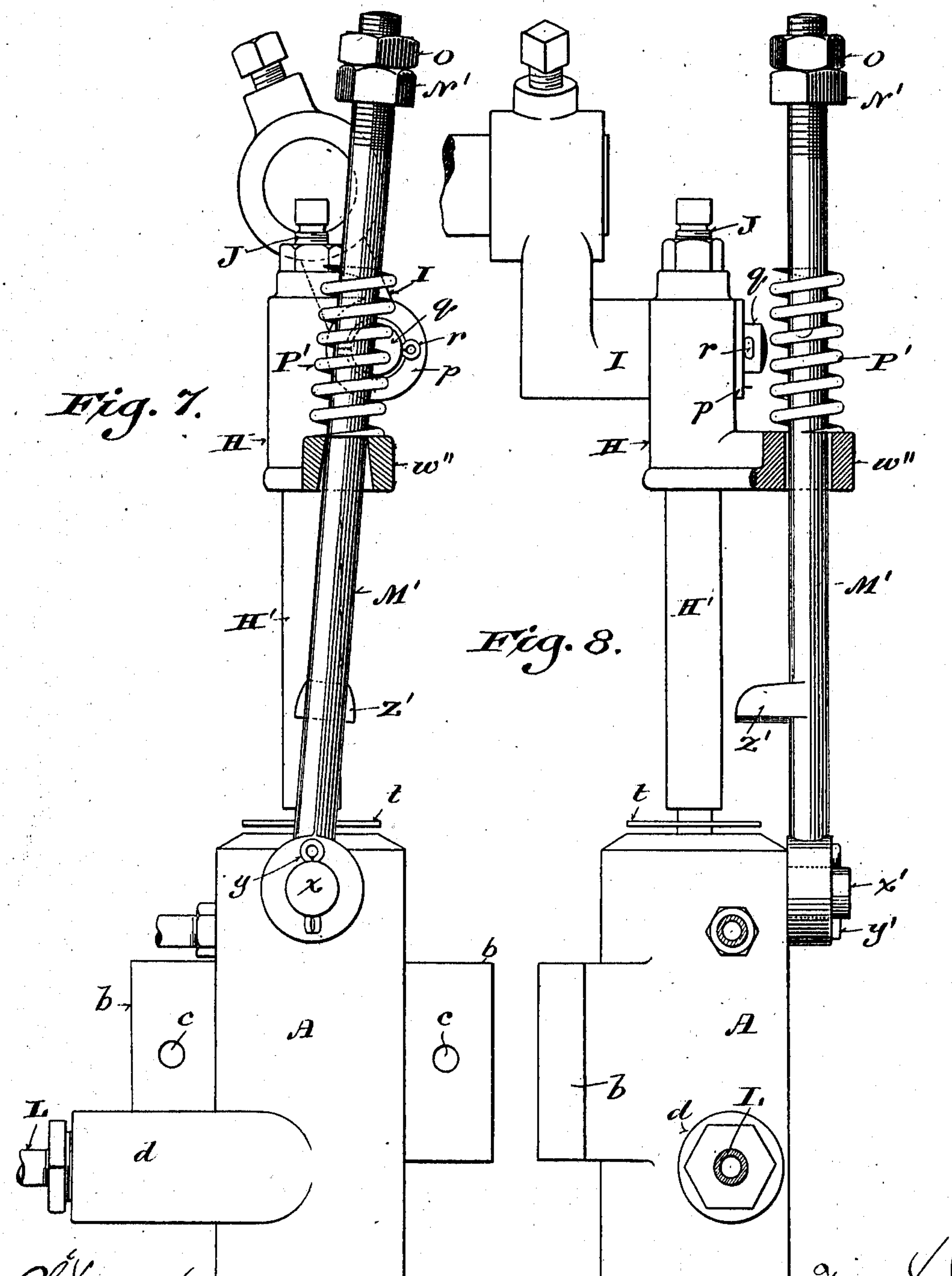

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UNITED STATES PATENT OFFICE.

GEORGE J. GOLLMAR, OF BARABOO, WISCONSIN.

MECHANICAL BELL-RINGER.

970,703. Specification of Letters Patent. Patented Sept. 20, 1910.

Application filed April 26, 1909. Serial No. 492,148.

To all whom it may concern:

Be it known that I, GEORGE J. GOLLMAR, a citizen of the United States, and resident of Baraboo, in the county of Sauk and State of Wisconsin, have invented certain new and useful Improvements in Mechanical Bell-Ringers; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention consists in what is hereinafter particularly set forth with reference to the accompanying drawings and pointed out in the claims of this specification, its object being to materially improve bell-ringers of the species originally disclosed in my now expired Patent No. 449,904, of April 7, 1891, the improved ringer being especially designed for the use of compressed air as the expansive fluid for operating its reciprocative elements in one direction, and having for its novel features a peculiar construction of valve, means by which the expansive fluid aforesaid is employed to hold the valve sufficiently tight in the cylinder of the apparatus without the aid of a spring, the means by which the piston and connecting rod of said apparatus are put in anti-binding detachable union, the means for excluding dust and cinders from said cylinder as well as from the piston and rod joint, the means limiting outward movement of said piston, and means by which piston impulses are retarded and whirling of a bell in connection with the aforesaid apparatus prevented.

Figure 1 of the drawings represents a partly sectional elevation of one of my improved mechanical bell-ringers, the same being especially designed for connection with a locomotive bell; Fig. 2, an elevation of the ringer from another point of view than that from which Fig. 1, is taken; Fig. 3, a horizontal section on the plane indicated by line 3—3 in Fig. 1, but illustrating another form of packing for a plunger exertive against the valve of the apparatus at a right-angle thereto; Fig. 4, a perspective view of the valve; Fig. 5, a partly sectional elevation of a fragment of said apparatus illustrating a form of means for anti-binding detachable union of the piston and connecting-rod of the aforesaid apparatus, the same being somewhat different from that shown in Fig. 1; Fig. 6, a perspective view of the contractile split ring shown in Fig. 5, and which may be substituted for the annularly disposed spiral spring shown in Fig. 1; Fig. 7, a partly sectional elevation of the ringer provided with means for retarding impulses given the piston, these means differing in detail from what is shown in Figs. 1 and 2. Fig. 8, a similar illustration from another point of view from which Fig. 7, is taken.

Referring by letter to the drawings, A indicates the cylinder of the apparatus, *b* its attaching wings provided with apertures *c* for securing bolts by which to attach the same to a bell-frame or other suitable support, said cylinder being closed at its lower end.

In sliding engagement with the major portion of the bore of a lower lateral offset boss *d* of the cylinder is a preferably choke-bore cylindrical plunger B, and slipped on the outer end of the plunger in Fig. 1, is an elastic packing-ring *e* engaging a taper enlargement of the stud-bore. As shown in Fig. 3, a hat-packing *e'* may be substituted for the packing ring *e* on said plunger. The inner end of the plunger is preferably diagonal and presses snug against a correspondingly slabbed outer portion of the hollow bottomless valve C within the cylinder A, the lower rim of the valve being provided with a recess *f* from bore to circumference and which at times communicates with the exhaust-port *g* of said cylinder. The slabbed portion of the valve constituting an outer angular face is provided with an upper central angular inclined notch *h* that normally communicates with the preferably choked outlet end of the bore of the plunger B, and extending through a central aperture in the otherwise closed upper end of said valve is the stem for same in the form of a screw D that adjustably engages a central recess in the lower portion of the suitably packed piston E having air-tight reciprocation in the cylinder A, an oil-cup F being preferably provided in connection with said cylinder to lubricate said piston and valve. The screw D is preferably secured in its adjusted connection with the piston E by means of a key *i* for which said piston is provided with a seat.

The upper end of the piston is provided with a central circular flaring recess in communication with the vertical annular mouth of an otherwise spherical socket in said piston below the recess and with which the ball-end *j* of a connecting rod G is engaged, the diameter of said mouth being such as to

permit ready engagement of said ball-end of said rod with said socket. Between the socket mouth and flare of said recess the piston is annularly grooved to receive a confining device for the ball-end of the connecting-rod. In Fig. 1, the confining device is a spring *k* annularly disposed under contraction in said groove. In Fig. 5, a washer *m* is shown laid in an enlargement of the socket-mouth of the piston under a contractile split ring *n* engaged with the groove aforesaid, and this ring may be substituted for the spring shown in Fig. 1.

The connecting-rod G has sliding engagement with the sleeve extension H′ of the head H that is provided with a hollow boss *p* through which to extend the shouldered end *q* of a bell-crank I, the engagement being maintained by a split-key *r* engaging an aperture in said end of the crank that projects outward from said boss.

The flaring upper end opening of the piston is filled with waste *s* under a cap-washer *t* on the connecting-rod to exclude dust and cinders from the ball-and-socket joint herein shown and described, as well as from the cylinder of the apparatus, and the rod and sleeve connection aforesaid is lengthened or shortened by means of an adjusting-screw J engaging the head H, a check-nut *u* being employed in connection with said screw to maintain its adjustment.

To limit outward movement of the piston a hook K is provided in pivotal connection with an ear *v* of the cylinder and confined between other ears *w* of said cylinder by a preferably split-key *x*, the head of the hook being in the path of the washer *t* on the connecting-rod. It is preferable as shown by dotted lines to provide the cylinder with an inclined groove in which to engage the shank of said hook. The split-key is withdrawn and the hook swung outward to permit of the piston being removed from the cylinder.

Coupled to the outer end of the cylinder-stud *b* is a pipe L for a fluid under pressure, compressed air being preferably employed.

In practice, the fluid under pressure being let on through the pipe L finds its way through the plunger B, up under the piston E and into the valve C, some of said fluid being exerted on said plunger to crowd said valve tight in the cylinder and thus prevent leak through the exhaust-port *g* of same, the diagonal inner end of the aforesaid plunger being self-centering upon the slabbed portion of the aforesaid valve against which it presses and has side-thrust for the purpose aforesaid. The fluid under pressure moves the piston E outward to actuate the bell-crank I, and incidental to this movement of said piston the head of the screw D will eventually lift the valve C to cut off the supply of fluid under pressure to the cylinder, said fluid then in said cylinder being expansive to continue said movement of the aforesaid piston until such time as the recess *f* of said valve registers with the exhaust-port *g* of said cylinder. The reverse movement of the working parts aforesaid is now effected by the weight of the bell, the fluid under pressure remaining in the valve serving as a cushion. The operations aforesaid continue as long as the fluid under pressure has flow through the supply-pipe L in connection with the cylinder of the apparatus.

To provide for retarding impulses of the piston and to prevent the bell from whirling, a suitable extensible or compressible spring is employed in conjunction with a movable stop carrier and the bell-crank or the actuating device for said crank.

In Figs. 1 and 2, the cylinder A is shown provided with a guide-lug *w′* for a rod M on which a stop-collar N is adjustably secured by a set-screw *z* below said lug, and connecting the upper eye-end of the rod with a hanger *x′* on the end *q* of the bell-crank is an extensible spring P, a washer *q′* being interposed between the hanger and the split-key *r* aforesaid. Incidental to outward movement of the piston, the rod P has free movement in its guide-lug *w* until the stop N on said rod comes into contact with said lug, at which time there is pull on the spring P by the bell-crank thereby retarding the outward impulse of said piston and parts in connection therewith.

In Figs. 7 and 8, the head H is shown provided with a lateral extension *w″* having a flaring vertical aperture therein, and loosely engaging this aperture is a rod M′ having an end thereof loose on a lateral pivot-stud *x′* of the cylinder A, a split-key *y* being extended through the pivot-stud to hold said rod thereon. Adjustable on the screw-threaded end of the rod M′ is a stop-nut N′ and a check-nut O, the stop-nut being in opposition to a spiral-spring P′ that surrounds said rod and is seated on the lateral extension *w″* of the head H aforesaid. The rod M′ is shown provided with a lateral lug *z′* that may be substituted for the hook K, above specified or employed in conjunction with the same as means for limiting outward movement of the piston E of the apparatus. The auxiliary rod M′ is free to oscillate with the bell-crank I and parts in connection therewith, while at the same time, the head H in its outward movement will eventually contract the spring P′ against the stop N′ to retard the impulse of the piston in the same direction and to prevent whirling of the bell.

It is to be understood that the omission of the spring P or P′ and proper arrangement of a stop in connection with the rod M or M′ will result in preventing whirling

of the bell, but said springs, arranged as shown and described, serve to absorb shock that would otherwise occur.

I claim:

1. In a mechanical bell-ringer of the species described, the combination of the single-acting engine cylinder provided with a lower lateral hollow boss, the engine-valve and piston in the cylinder, and a hollow plunger in packed sliding engagement with the bore of said boss in opposition to said valve to have side-thrust against the same under pressure of fluid under pressure admitted through said plunger to space between the aforesaid valve and said piston, whereby the valve is crowded tight in the cylinder to prevent leak from the exhaust-port of same.

2. In a mechanical bell-ringer of the species described, the combination of the single-acting engine cylinder provided with a lower hollow boss, the engine-valve in the cylinder having a slabbed outer portion, the engine-piston, and a hollow plunger in packed sliding engagement with the bore of said boss in opposition to the slabbed portion of said valve to have side-thrust against the same under pressure of fluid under pressure admitted through said plunger to space between the aforesaid valve and said piston, whereby the valve is crowded tight in the cylinder to prevent leak from the exhaust-port of same.

3. In a mechanical bell-ringer of the species described, the combination of the single-acting engine cylinder, its piston, and the piston-controlled hollow bottomless valve having a lower rim exhaust-recess from bore to circumference and provided with an upper outer notch that normally communicates with the inlet for fluid under pressure to said cylinder, said recess being alternately in and out of communication with the exhaust-port of the aforesaid cylinder incidental to reciprocation of said piston upon which initial pressure of said fluid is had through said notch.

4. In a mechanical bell-ringer of the species described, the combination of the single-acting engine cylinder, its piston, the piston-controlled hollow bottomless valve having an upper notched angular outer portion and a lower rim exhaust-recess, and a hollow plunger in packed sliding engagement with the bore of an offset lower hollow lateral boss with which said cylinder is provided, the inner end of the plunger being diagonal and opposed to the angular portion of said valve to have side thrust against the same under pressure of fluid under pressure admitted through said plunger and the valve notch to space between the aforesaid valve and said piston.

5. In a mechanical bell-ringer of the species described, the combination of the single-acting engine-cylinder, its piston and a connecting-rod held together in detachable ball-and-socket joint connection, the piston-controlled bottomless valve having an upper notched angular outer portion and a lower rim exhaust-recess, and a hollow plunger in packed sliding engagement with the bore of an offset lower hollow lateral boss with which said cylinder is provided, the inner end of the plunger being diagonal and opposed to the angular portion of said valve to have side thrust against the same under pressure of fluid under pressure admitted through said plunger and the valve notch to space between the aforesaid valve and said piston.

6. In a mechanical bell-ringer of the species described, the combination of the single acting engine cylinder, the piston in the cylinder, a hook in swing connection at one end with the cylinder to have its other end normally in the path of said piston, and means for securing said hook in said position as a stop to limit outward movement of the piston.

7. In a mechanical bell-ringer of the species described, the combination of the single-acting engine-cylinder, the engine-valve and piston in the cylinder, a plunger arranged to have side-thrust against the valve under pressure of a fluid under pressure admitted to the cylinder through said plunger, the connecting rod with the piston, the bell-crank in sliding sleeve connection with said rod, and means in conjunction with the cylinder and bell-crank for retarding impulses of the piston and limiting sway of said crank.

8. In a mechanical bell-ringer of the species described, the combination of the single-acting engine-cylinder, the engine-valve and piston in the cylinder, a plunger arranged to have side-thrust against the valve under pressure of a fluid under pressure admitted to the cylinder through said plunger, the connecting rod with the piston, the bell-crank in sliding sleeve connection with said rod, means in conjunction with the cylinder and bell-crank for retarding impulses of the piston and limiting sway of said crank, and means for limiting outward movement of said piston.

In testimony that I claim the foregoing I have hereunto set my hand at Baraboo in the county of Sauk and State of Wisconsin in the presence of two witnesses.

GEORGE J. GOLLMAR.

Witnesses:
THOS. M. MOULD,
G. W. ENGLISH.