

Signal Bell for Steam Vessels.

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UNITED STATES PATENT OFFICE.

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MECHANISM FOR OPERATING PILOTS' BELLS ON STEAMERS.

Specification of Letters Patent No. 18,641, dated November 17, 1857.

To all whom it may concern:

Be it known that I, J. R. HOPKINS, of Lincoln, in the county of Penobscot and State of Maine, have invented a new and Improved Signal Apparatus for Communicat-
5 ing Orders from the Pilot-Houses to the Engine-Rooms of Steam Vessels; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1, is a front view of my improvement. Fig. 2, is a side view of the portion
15 of the apparatus by which the cylinder and bell hammers are operated, the case of said parts being bisected as indicated by the line (x) (x) Fig. 3. Fig. 3, is a back view of the above named parts. Fig. 4, is a detached top
20 or plan view of the cylinder and the mechanism by which it is operated. Fig. 5, is a detached side view of the mechanism by which the bell hammers are operated. Fig. 6, is a vertical section of the mechanism by
25 which the knob, when operated, is made to actuate the mechanism which actuates the cylinder and bell hammers. (y), (y), Fig. 7, indicates the line of section. Fig. 7 is a back view of ditto.

30 Similar letters of reference indicate corresponding parts in the several figures.

This invention consists 1st in so arranging and connecting a hand knob, which is placed in the pilot house, with certain mechanism which rotates a cylinder and actuates
35 bell hammers, that said cylinder may be rotated at the will of the pilot so as to present to the engineer proper signs relating to the manipulation of the engine, such as "Stop,"
40 "Shut off," "Head," "Back," &c., and the bell rung at each movement of the cylinder so as to direct the attention of the engineer to it.

45 The invention consists 2nd in a novel arrangement of means for actuating the cylinder whereby the same may be turned the proper distance each time it is actuated and prevented from casually moving.

50 The invention consists 3d in the employment or use of two bell hammers arranged and operated in a peculiar way so that they will not only be actuated in connection with the cylinder, but the striking of the bell also insured at each movement of the same.

55 To enable those skilled in the art to fully

understand and construct my invention I will proceed to describe it.

A represents a rectangular box in the front of which a plate B is fitted. This plate has a number of slightly curved slots
60 (a) (b) (c) (d) made through it, the inner ends of the slots meeting at the center of the plate. Four slots are shown in Figs. 1 and 7, but more may be employed if desired.

C represents a knob the shank (e) of
65 which is fitted in the slots in the plate B, and as these slots all communicate with each other at the center of the plate it will be seen that the shank (e) may be moved into either of the slots at the will of the operator. 70 See Figs. 1, 6, and 7. The inner end of the shank (e) is connected to the outer end of a lever (f), the inner end being pivoted to one end of a lever (g), the opposite end of which is pivoted to the plate B, as shown at
75 (h) Fig. 7.

To the inner side of the plate B, four levers (i) (j) (k) (l) are pivoted and so disposed that their inner ends will cross the
80 slots (a) (b) (c) (d). The outer ends of the levers (i) (j) (k) (l) are connected by wires (m) and bell cranks (n) see Fig. 7, to a series of bars (o) (p) (q) (r) see Fig. 3, which form part of the mechanism for operating the cylinder and bell hammers
85 hereinafter described.

To the inner side of the front of the box A there is attached a slide D, the lower end of which is attached to a lever E which is connected by wires (s) and bell crank to a
90 bar (u) which is placed by the side of the ones (o) (p) (q) (r). This slide D has a knob F attached, the shank of which is fitted in a slot in the front of the box A, see
95 Fig. 1.

The box A is placed in the pilot house of the vessel the knobs C, F, being within the reach of the pilot. Within the engine room of the vessel and at any place where it can be conveniently seen by the engineer a box
100 G is placed, see more particularly Figs. 2 and 3.

Within the box at its upper end a bell H is secured and a cylinder I is also placed within the box a portion of the front sur-
105 face of the cylinder being visible through a slot (v) in the front of the box. The axis or shaft (w) of the cylinder I, has its bearings in a frame J, within the box, and a ratchet (z) is placed at one end of the shaft
110

(*w*), said ratchet having a pawl (*a'*) catching into it, the pawl being attached to a projection (*b'*) on the frame J, and preventing the cylinder I turning in the direction indicated by arrow (1). See Figs. 2, 3 and 4.

On the end of the shaft (*w*) adjoining the ratchet (*z*) a pinion (*c'*) is placed loosely, said pinion being allowed to turn in one direction as indicated by arrow (2) independently of the shaft (*w*) but made to turn with the shaft, when the latter is rotated in the direction indicated by arrow (3), by means of a ratchet (*d'*) which is attached to its inner end, and a pawl (*e'*) which catches into it, the pawl (*e'*) being attached to the side of the ratchet (*z*).

K is a segment rack which gears into the pinion (*c'*). This rack is attached to one end of a bar (*f'*) the opposite end of said bar being fitted on a rod or pin (*g'*) on which it is allowed to turn or work freely. The bar (*f'*) has a spring (*h'*) attached to it, which spring has a tendency to draw the rack downward. See Fig. 2.

Within the frame J, the bars (*o*) (*p*) (*q*) (*r*) (*u*) are placed side by side and just back of the shaft (*w*), said bars being allowed to slide freely up and down within the frame J, and working through proper guide plates (*i'*). To the lower end of each bar a spring (*j'*) is attached, said springs having a tendency to draw the bars downward. The upper ends of the bars are connected to the wires (*m*). See Figs. 2 and 3.

To each bar (*o*) (*p*) (*q*) (*r*) (*u*) a short horizontal projecting bar (*k'*) is attached, and upon a rod or shaft (*l'*) in the frame J, one edge of a plate L is fitted loosely so that it may be moved freely up and down. The opposite edge of this plate rests upon the projecting bars (*k'*) and a spiral spring (*m'*) which is connected therewith has a tendency to keep said plate down upon the projecting bars (*k'*).

On the rod or shaft (*l'*) the upper ends of two bars (*n'*) (*n'*), are secured, and the lower ends of these bars are connected by a cross plate (*o'*). See more particularly Fig. 3. The upper ends of the bars (*n'*) (*n'*) are bent around and fitted loosely on the shaft (*l'*) and a spring (*p'*) is connected to one bar (*n'*), said spring having a tendency to press or force the plate (*o'*) against the back ends of a series of drop levers (*q'*) the front ends of which are fitted or placed loosely on a rod (*r'*) in the front part of frame J. These levers (*q'*) rest upon hooks (*s'*) attached to the bars (*o*) (*p*) (*q*) (*r*) (*u*) and are kept down on them by springs (*t'*). Each lever (*q'*) has a pin (*u'*) projecting from one of its sides, and to the shaft (*w*) of the cylinder I rods (*v'*) are attached. The pins (*u'*) on the levers (*q'*) serve as stops as they arrest the rods (*v'*) and consequently the cylinder I, each at the proper

time, as hereinafter shown. To the inner side of the segment rack K a pin (*w'*) is attached.

To the inner edge of the plate L, the upper end of a vertical bar (*x'*) is pivoted. See more particularly Fig. 5. This bar is provided with two lateral projections or shoulders (*y'*) (*y'*), one at each side, and a spring (*z'*) is also attached to each side of the bar, the lower ends of the springs being attached to the bar near the shoulders.

Within the frame J two levers M, M', are pivoted as shown at (*a''*). These levers are of bent form as plainly shown in Fig. 3, and a hammer N, is placed on the upper end of each lever. The lower horizontal parts (*b''*) of the levers M have each a spring (*c''*) attached to them and the ends of the parts (*b''*) pass through vertical slots (*d''*) in a plate O, secured in the frame J, just back of the bar (*x'*). Between the bar (*x'*) and the plate O, a plate P is placed, the lower end of this plate is pivoted in the frame J, as shown at (*e''*) and an inclined shoulder (*f''*) is formed at each side of the plate P. See Fig. 5.

On the front of the box A opposite the end of the slot (*a*) the word "Stop" is painted, "Back" is placed opposite the slot (*b*), "Head" opposite the slot (*d*), "Shut off" opposite the slot (*c*), and "Hook on" is placed above the knob F. It is not essential that these words be painted or engraved on the box, but it would be perhaps preferable.

The operation is as follows:—Suppose for instance the pilot desires to stop the boat. He grasps the knob C, and raises it until it reaches the outer or upper end of the slot (*a*), as the knob C, is raised the bar (*p*) will also be raised through the medium of the wires and bell cranks previously described and the projecting bar (*k'*) on the bar (*p*) will raise the plate L, and consequently the bar (*x'*) will be raised and the end of the part (*b''*) of the lever M that rests upon one of the shoulders (*y'*) of the bar (*x'*) will be raised and caught by one of the shoulders (*f''*) of the plate P, and when said part rests upon the shoulder (*f''*) the part (*b''*) of the other lever M' is released in consequence of its spring (*j'*) causing said parts to bear upon its inclined shoulder (*f''*) and canting or tilting the plate P at one side, the part (*b''*) of lever M', dropping upon one of the projections or shoulder (*y'*) of the bar (*x'*), the projection or shoulder being forced under it by one of the springs (*z'*) and the hammer N of said lever striking the bell H. Thus the two hammers strike the bell alternately, one lever releasing the other as described. By this arrangement the ringing is always certain whenever the knob is actuated. As the bar (*p*) raises, its hook (*s'*) raises its lever (*q'*) and the back end of said lever forces

outward the plate (o') and when the back end of said lever passes above the plate (o') the plate is forced inward underneath said lever by the spring (p') and the lever is re-
 5 tained elevated by said plate so that its pin (u') will serve as a stop to the rod (v) on the shaft (w) that retains the cylinder in proper place, for when the plate L rises, the segment rack R is moved upward in conse-
 10 quence of its pin (w') projecting over the edge of the plate L and the pinion (c') is turned in the direction of arrow (2), but as the lever (q') of the bar (q) as it is raised forces outward the plate (o') the lever (q')
 15 that previously rested upon it will be released in consequence of its bevel α , each lever being thus beveled, and the pin of this lever (q') being thereby removed from the rod (v) which pressed against it the spring
 20 (h') of the bar (f') will draw down the rack K and the pinion (c') will be rotated in the direction of arrow (3) and the cylinder I will consequently be rotated until the word "stop" on the cylinder is brought directly
 25 in line with the slot (v) the cylinder being arrested at the desired point in consequence of the pin (u') on the lever (q') of the bar (q) being raised so as to arrest the proper rod (v) on the shaft (w), for it will be un-
 30 derstood that there is a rod (v) for the pin of every lever (q') and for all the words on the cylinder, the same words being engraved on the cylinder as are marked or painted on the front of box A. When a different or
 35 succeeding order is given, the lever (q') that is raised will release or cause the preceding lever to be depressed thereby liberating the cylinder and allowing it to be turned by the rack K and pinion (c') the pin (u') of the
 40 lever (q') which is last raised serving as a stop to arrest the cylinder at the proper time, so that the proper word on the cylinder is brought opposite the slot (v).

Thus it will be seen that the cylinder is
 45 actuated and the bell struck at every movement of the knob C, the proper sign or order being presented to the engineer and by hav-

ing the knob C, or rather its shank placed in the slots in the plate B as shown the pilot can operate the knob equally as well by
 50 night as by day, as each movement soon becomes familiar to him. I prefer having a separate arrangement for the "Hook on" order for this reason. By having a separate knob F, the pilot will not be liable to
 55 make a mistake. If a slot were made in the plate B so that this order could be given by the same knob as the others, a mistake might occur, the "Hook on" order might be given
 60 when "Stop" or other order was intended and a vessel would in that case be liable to be run into the dock under a full head of steam. To avoid this contingency therefore I use the separate knob.

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

1. The arrangement of the knob C and slotted plate B, substantially as shown, so that the several orders may be transmitted
 70 to the engineer, or, the cylinder I rotated as desired to present such orders, by moving one and the same knob in different directions.

2. I claim the bars (o) (p) (q) (r) (u)
 75 levers (q') provided with pins (u') plates L and (o') segment rack K, pinion (c') and rods (v) on the shaft (w) when the whole are arranged to operate as and for the purpose set forth.
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3. I claim the employment or use of the two levers M, M', provided with bell hammers N, N, and operated by means of the bar (x') attached to plate L and provided with
 85 springs (z') (z') and the plate P, the bar and plate being provided respectively with the projections or shoulders (y') (y') (f'') (f'') and the whole arranged substantially as shown and described.

J. R. HOPKINS.

Witnesses:

G. YORKE AT LEE,
 J. P. JACOBS.