

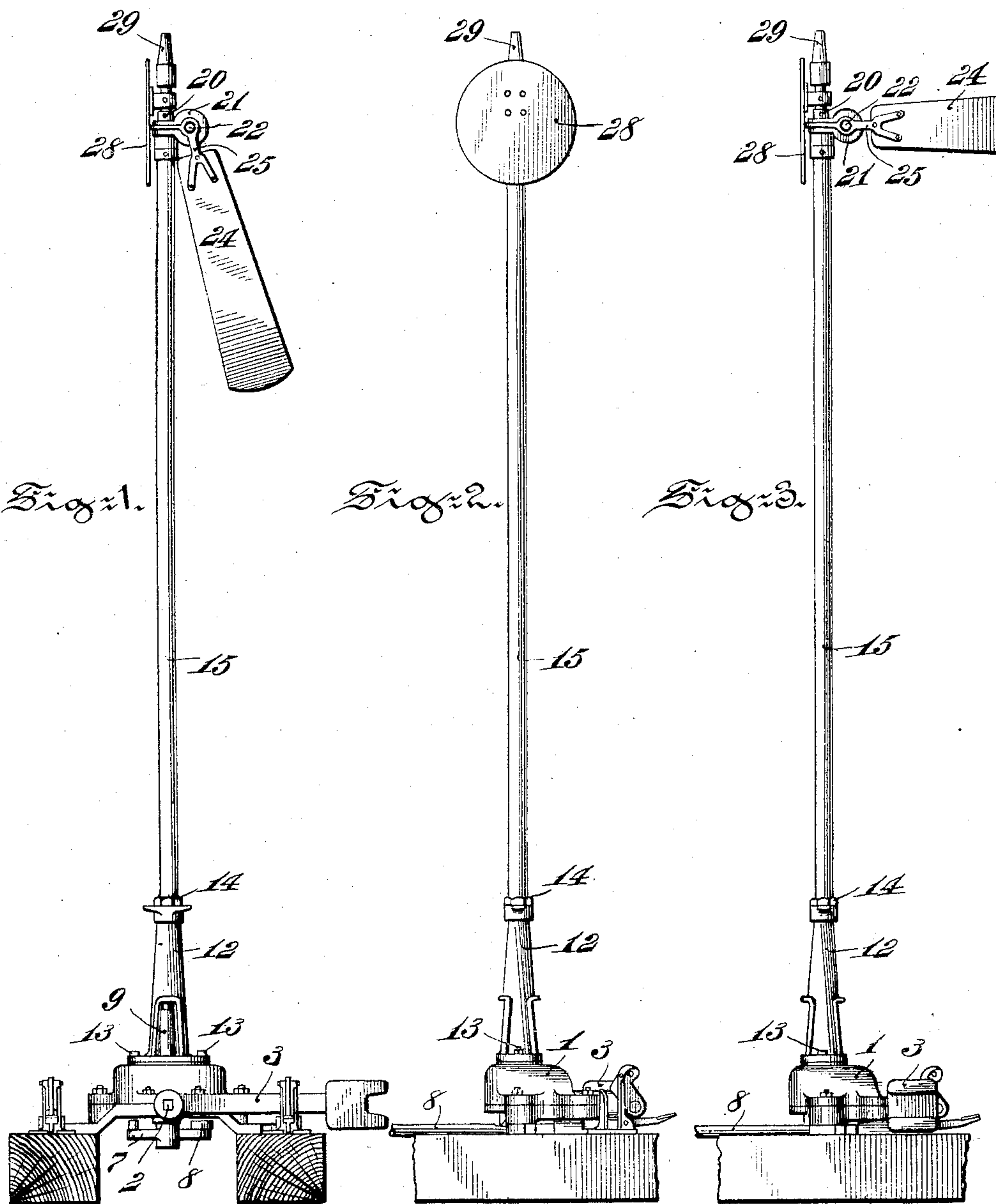
No. 866,872.

PATENTED SEPT. 24, 1907.

M. W. LONG.
SEMAPHORE SWITCH STAND.

APPLICATION FILED FEB. 14, 1907.

3 SHEETS—SHEET 1.



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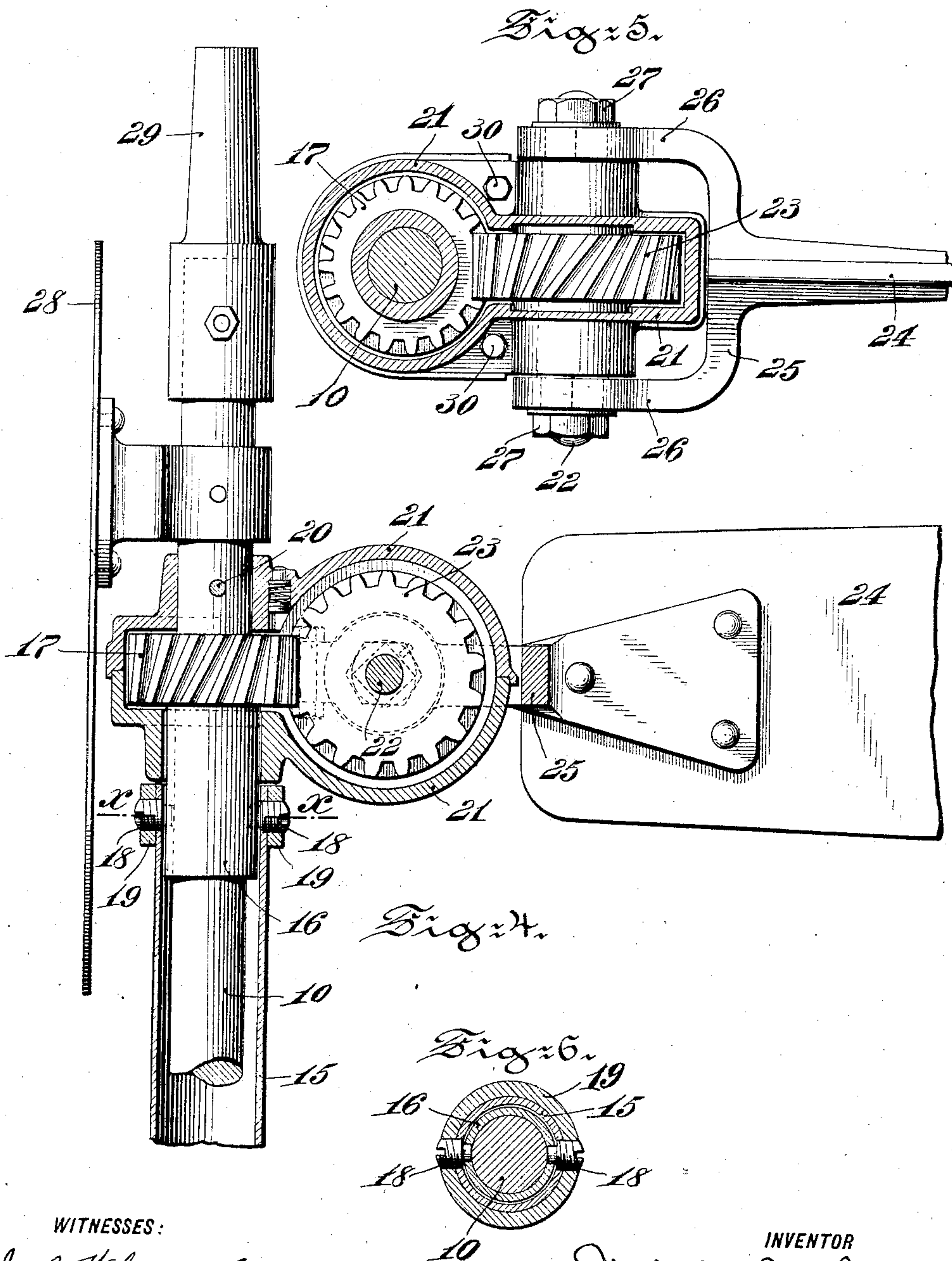
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3 SHEETS—SHEET 2



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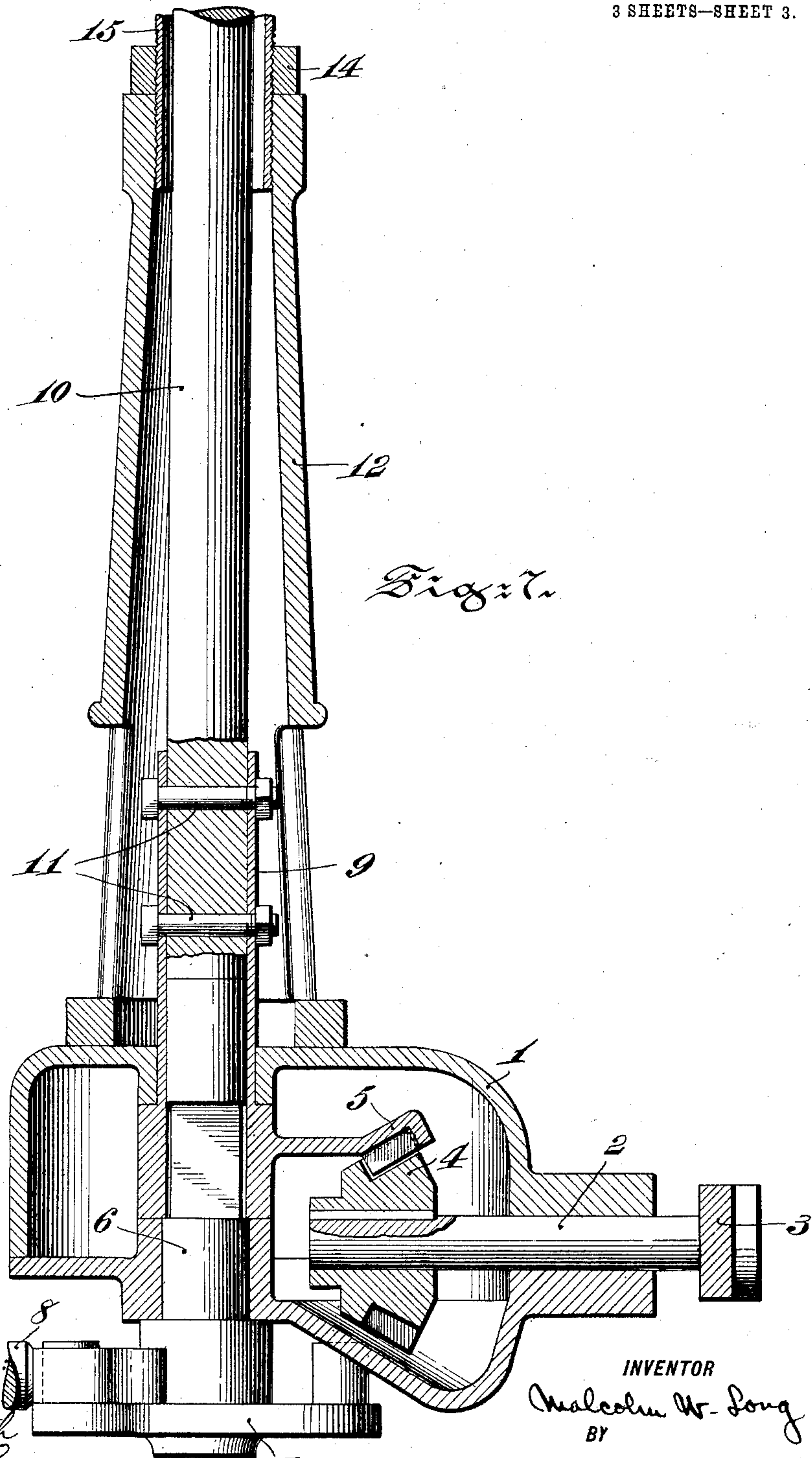
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3 SHEETS—SHEET 3.



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MALCOLM W. LONG, OF HARRISBURG, PENNSYLVANIA, ASSIGNOR TO THE PENNSYLVANIA STEEL COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

SEMAPHORE SWITCH-STAND.

No. 866,872.

Specification of Letters Patent.

Patented Sept. 24, 1907.

Application filed February 14, 1907. Serial No. 357,262.

To all whom it may concern:

Be it known that I, MALCOLM W. LONG, a citizen of the United States, and a resident of Harrisburg, Dauphin county, State of Pennsylvania, have invented
5 certain new and useful Improvements in Semaphore Switch-Stands, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, of which—

Figure 1 is an elevation, looking toward the track,
10 of a switch-stand in which my invention is embodied, the parts being in the position in which the switch is set for the main line, the target and semaphore so indicating. Fig. 2 is an end elevation of Fig. 1, that is, looking in the direction parallel with the track. Fig.
15 3 is a view similar to Fig. 2, but showing the parts in position in which the lever-arm has been thrown over to the opposite horizontal position, to set the switch for the siding, the horizontal position of the semaphore so indicating. Fig. 4 is a vertical section partially in
20 elevation, of the upper end of the signal shaft, and its incasing tube, showing the mechanism for operating the semaphore blade. Fig. 5 is a horizontal section as on the line $x-x$ Fig. 4. Fig. 6 is a section on the line $x-x$, Fig. 4. Fig. 7 is a vertical section through the
25 switch-stand, and the lower portion of the signal shaft and its inclosing case.

This invention relates to improvements in switch-stands, more particularly to that class of switch-stands in which the signal is operated at the upper
30 end of a vertical signal shaft rotated by the operation of the stand.

The immediate object of this invention is to provide such a stand with a semaphore blade which shall be operated by the rotation of said vertical signal shaft,
35 when the switch-stand is operated.

The switch-stand proper illustrated in the drawings is of a type well known upon the market as the New Century switch-stand, and comprises a casing, 1, in which is journaled a horizontal shaft, 2, provided at
40 its outer end with an operating weighted lever-arm, 3, and on its inner end with a beveled pinion, 4, engaging a segment gear, 5, secured to a vertical crank shaft, 6, which is journaled in said casing, 1 and is provided, at its lower end with the usual crank, 7, connected by a
45 bar, 8, with the switch, in the well known manner. Extending upwardly through the casing, 1, is a hub extension, 9 from the segment gear 5, which hub extension has, extending thereinto, the lower end of a vertical signal shaft, 10, the parts being secured
50 together by bolts, 11, or other suitable means.

Mounted upon the casing, 1, is a tubular housing, 12, bolted to said casing by bolts, 13, and extending from the top of said housing, 12, being screwed into the upper end thereof and held in place by a jam nut,
55 14, incasing said signal shaft, 10, is a tube, 15. Within

the upper end of the tube, 15, extends the hub, 16, of a horizontal planetary gear, 17, through which hub and gear said signal shaft, 10, extends, and is free to rotate. The said hub, 16 is secured to the upper end of said tube, 15, by means of screws, 18, passing through
60 said tube (and a reinforcing collar, 19, thereon) and into said hub, as seen in Fig. 4.

Secured to the signal shaft, 10, by means of a through pin, 20, is a casing, 21, in which is journaled a horizontal shaft, 22, carrying a planetary gear, 23, whose
65 teeth engage those of the planetary gear 17. Said casing also incloses said planetary gears, preventing access of dirt or dust thereto. A semaphore blade, 24, is mounted upon said horizontal shaft, 22, said blade being secured to a bifurcated yoke, 25, whose limbs, 26,
70 are fitted on squared end-extensions of said shaft, 22, beyond the casing, 21, being secured in place by nuts, 27, screwed upon the outer ends of said shaft. The signal shaft, 10, is also provided with a target, 28, secured to an arm, 29, extending from and secured to
75 said shaft.

Having now briefly described the construction of my invention, I shall proceed with the description of the operation thereof.

The parts being in the positions shown in Figs. 1 and
80 2; that is, the switch set for the main line, so that when looking down the trackway toward the switch the semaphore blade, 24, is in the downward position, hidden behind the tube, 15, and the target, 28 presented toward the observer; if, now, the operating
85 lever, 3, be thrown from the horizontal position illustrated in said Figs. 1 and 2, to the opposite position; that is, that shown in Fig. 3; to set the switch for the siding, the operation is as follows:—The movement of said lever-arm, 3, rotates the shaft, 2, through an arc
90 of 180 degrees, and the pinion, 4, of said shaft rotates the segment gear, 5, through an arc of 90 degrees; thereby through the crank shaft, 6, and its connections with the switch operating the latter. The vertical signal shaft, 10, is also rotated 90 degrees, thereby
95 causing the casing, 21 (which, it will be remembered, is secured to said shaft) and the parts carried thereby, to rotate, and during such rotation of the gear case, 21, the planetary gear, 23, is caused, by the stationary planetary gear, 17, which is supported upon the tube, 100
15, to rotate on its axis, thereby rotating the horizontal shaft, 22, upon which said gear, 23, is mounted. The planetary gears, 23 and 17, are so proportioned that the rotation of the signal shaft, 10, through an arc of 90 degrees will cause said shaft 22 to rotate through a
105 slightly less angle to bring the semaphore blade which is carried by said shaft, 22, from the downward position of Fig. 1 to the horizontal position of Figs. 3 and 4, at the same time presenting said semaphore blade, 24, at right angles to the track. This rotation of the signal 110

shaft, 10, also carries the target, 28, from the position of Fig. 2 to that of Fig. 3, in which latter position it is presented edgewise to the observer. These latter relative positions of the target and semaphore indicate to a person coming down the track that the switch is set for the siding.

I would usually provide the top of the signal shaft 10, with a lamp-post, 29, upon which a lamp signal may be mounted for night service.

10 I remark that in practice I make the gear case, 21 of two parts divided horizontally on the line of the center of the shaft, 22, as seen in Figs. 4 and 5, said parts being secured together by means of bolts, 30.

The housing, 12, serves as a convenient support into which the lower end of the tube, 15, may be screwed, and said housing and tube, 15, not only serves to inclose the signal shaft, 10, thereby keeping dirt, &c. therefrom, but said tube also serves as a support for the stationary planetary gear, 17.

20 In assembling the apparatus, after the parts have been connected together, the tube, 15, is rotated in the upper part of the housing, 12, until the semaphore and target are brought to the proper position with relation to the track; and the switch setting; whereupon the jam-nut, 14, secures said tube immovably in said position of adjustment.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. In a semaphore switch-stand, the combination of switch-operating means, a casing inclosing the same, a tubular, vertical extension supported upon said casing, a vertical shaft within said tubular extension, and whose lower end is connected to said switch-operating means, a planetary gear secured to the upper end of said tubular extension, a horizontal shaft carried by said vertical shaft, a planetary gear on said horizontal shaft whose teeth engage those of said first mentioned gear, together with a semaphore blade carried by said horizontal shaft, substantially as and for the purpose set forth.

2. In a semaphore switch-stand, the combination of switch-operating means, a casing inclosing the same, a tubular, vertical extension supported upon said casing, a vertical shaft within said tubular extension, and whose lower end is connected to said switch-operating means, a planetary gear secured to the upper end of said tubular extension, a gear-case carried by and secured to said vertical shaft and incasing said planetary gear, a horizontal shaft journaled in said casing, a planetary gear upon said shaft within said casing, and whose teeth engage those of the first mentioned gear, together with a semaphore blade carried by said horizontal shaft, substantially as and for the purpose set forth.

3. In a semaphore switch-stand, the combination of switch-operating means, a casing inclosing the same, a tubular, vertical extension supported upon said casing, a vertical shaft within said tubular extension, and whose lower end is connected to said switch-operating means, a planetary gear secured to the upper end of said tubular extension, a horizontal shaft carried by said vertical shaft, a planetary gear on said horizontal shaft whose teeth engage those of said first mentioned gear, together with a semaphore blade carried by said horizontal shaft, and the target disk secured to said vertical shaft in suitable relation to said semaphore blade, substantially as and for the purpose set forth.

4. In a semaphore switch-stand, the combination of switch-operating means, a casing inclosing the same, a tubular, vertical extension supported upon said casing, a vertical shaft within said tubular extension, and whose lower end is connected to said switch-operating means, the planetary gear having the downwardly extending hub portion fixed to the upper end of said tubular extension, and

through which hub and gear the said vertical shaft extends and is free to rotate, the horizontal shaft carried by said vertical shaft, a planetary gear on said horizontal shaft whose teeth engage those of said first mentioned gear, together with a semaphore blade carried by said horizontal shaft, substantially as and for the purpose set forth.

5. In a semaphore switch-stand, the combination of switch-operating means, a casing inclosing the same, a tubular, vertical extension supported upon said casing, a vertical shaft within said tubular extension, and whose lower end is connected to said switch-operating means, the planetary gear having the downwardly extending hub portion fixed to the upper end of said tubular extension, and through which hub and gear the said vertical shaft extends and is free to rotate, a gear case carried by and secured to said vertical shaft and incasing said planetary gear, a horizontal shaft journaled in said casing, a planetary gear upon said shaft within said casing and whose teeth engage those of the first mentioned gear, together with a semaphore blade carried by said horizontal shaft, substantially as and for the purpose set forth.

6. In a semaphore switch-stand the combination of a lower casing, an upwardly projecting tubular extension secured thereto, switch-operating means in said lower casing, a shaft extending through said tubular extension and operatively connected with the switch-operating means, a closed gear-box carried by said shaft, a semaphore supported on the exterior of said gear box, a stationary gear carried by said tubular extension, and operating mechanism between said gear and said semaphore whereby rotation of said shaft will cause said semaphore to be raised and lowered, substantially as and for the purpose set forth.

7. In a semaphore switch-stand the combination of switch-operating means, a casing inclosing the same, a tubular, vertical extension supported upon said casing and whose lower end is rotatively secured thereto, means for securing said tubular extension in any position of rotative adjustment with relation to said casing, a vertical shaft within said tubular extension and whose lower end is connected to said switch-operating means, a planetary gear secured to the upper end of said tubular extension, a horizontal shaft carried by said vertical shaft, a planetary gear on said horizontal shaft whose teeth engage those of the first mentioned gear, together with a semaphore blade carried by said horizontal shaft, substantially as and for the purpose set forth.

8. In a semaphore switch-stand the combination of switch-operating means, a casing inclosing the same, a tubular vertical extension supported upon said casing and whose lower end is screwed thereinto, a jam nut securing said extension in any position of rotative adjustment, a vertical shaft within said tubular extension, and whose lower end is connected to said switch-operating means, a planetary gear secured to the upper end of said tubular extension, a horizontal shaft carried by said vertical shaft, a planetary gear on said horizontal shaft whose teeth engage those of said first mentioned gear, together with a semaphore blade carried by said horizontal shaft, substantially as and for the purpose set forth.

9. In a semaphore switch-stand, the combination of switch-operating means, a casing inclosing the same, a tubular housing extending from and secured to said casing, the vertical tube whose lower end is screwed into the upper end of said tubular housing, the jam nut securing said tube in any position of rotative adjustment, the vertical shaft within said tubular extension and whose lower end is connected to said switch-operating means, a planetary gear secured to the upper end of said tubular extension, a horizontal shaft carried by said vertical shaft, a planetary gear on said horizontal shaft whose teeth engage those of said first mentioned gear, together with a semaphore blade carried by said horizontal shaft, substantially as and for the purpose set forth.

In testimony whereof, I have hereunto affixed my signature.

MALCOLM W. LONG.

Witnesses:

WM. M. HENDERSON,
WM. R. MILLER.