

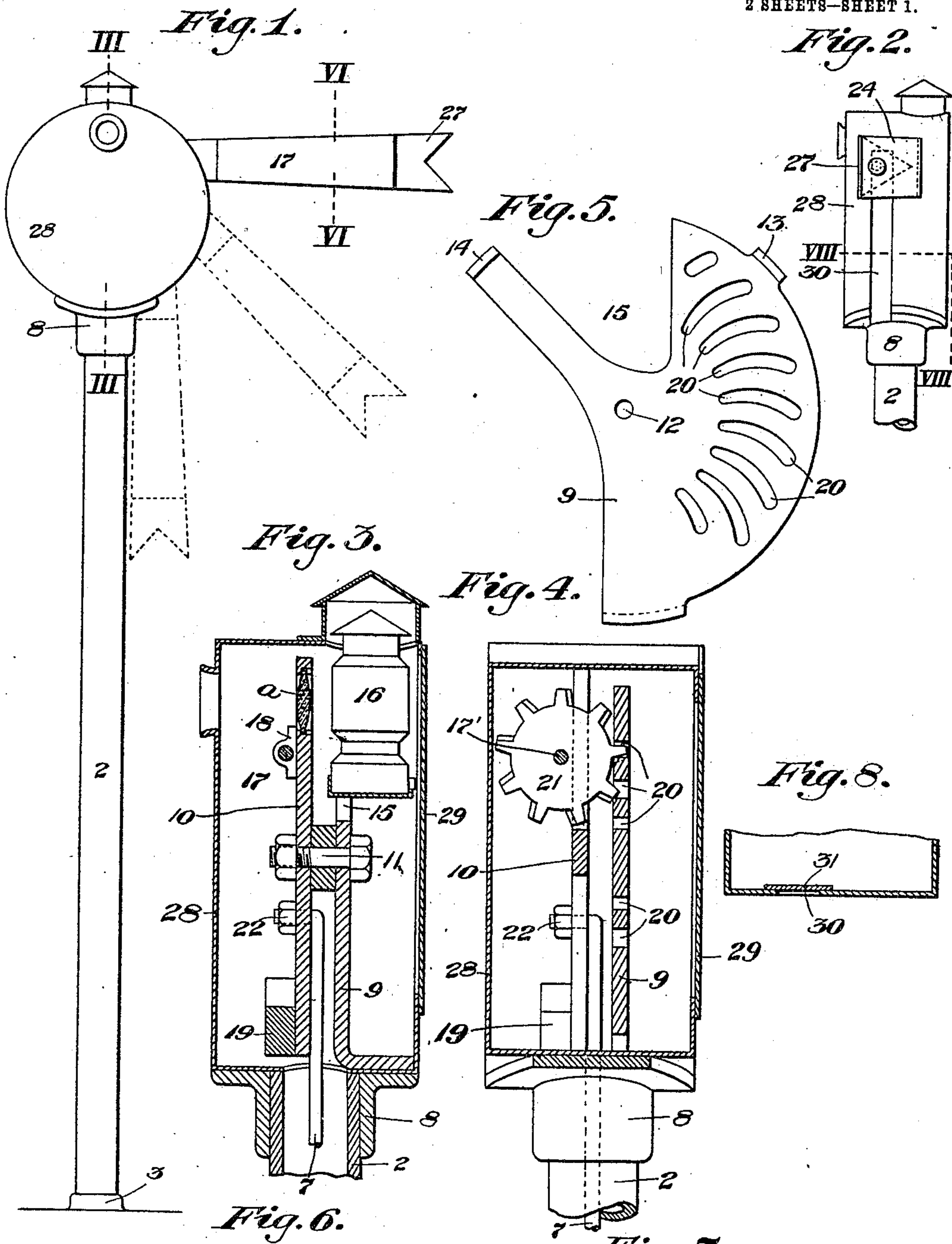
No. 837,421.

PATENTED DEC. 4, 1906.

W. A. RICHARDSON.
SIGNAL.

APPLICATION FILED FEB. 21, 1906,

2 SHEETS—SHEET 1.



Witnesses:

E. R. Rodd.

Chas. S. Sepley.

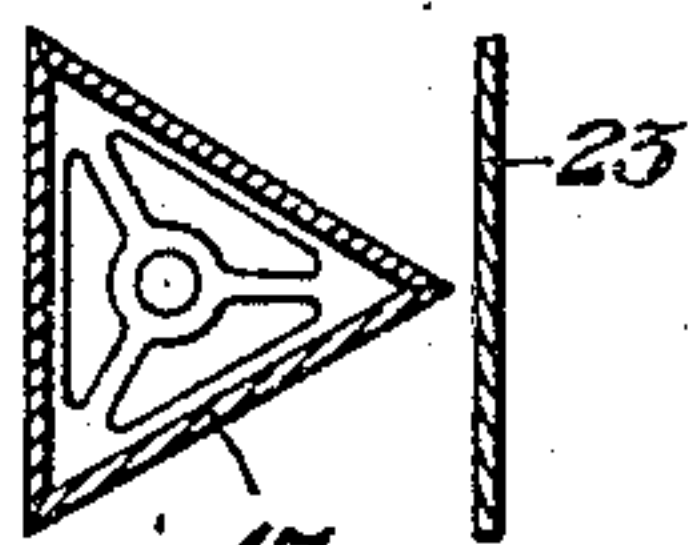


Fig. 7.

Inventor:

William A. Richardson

by A. M. Clarke
his attorney

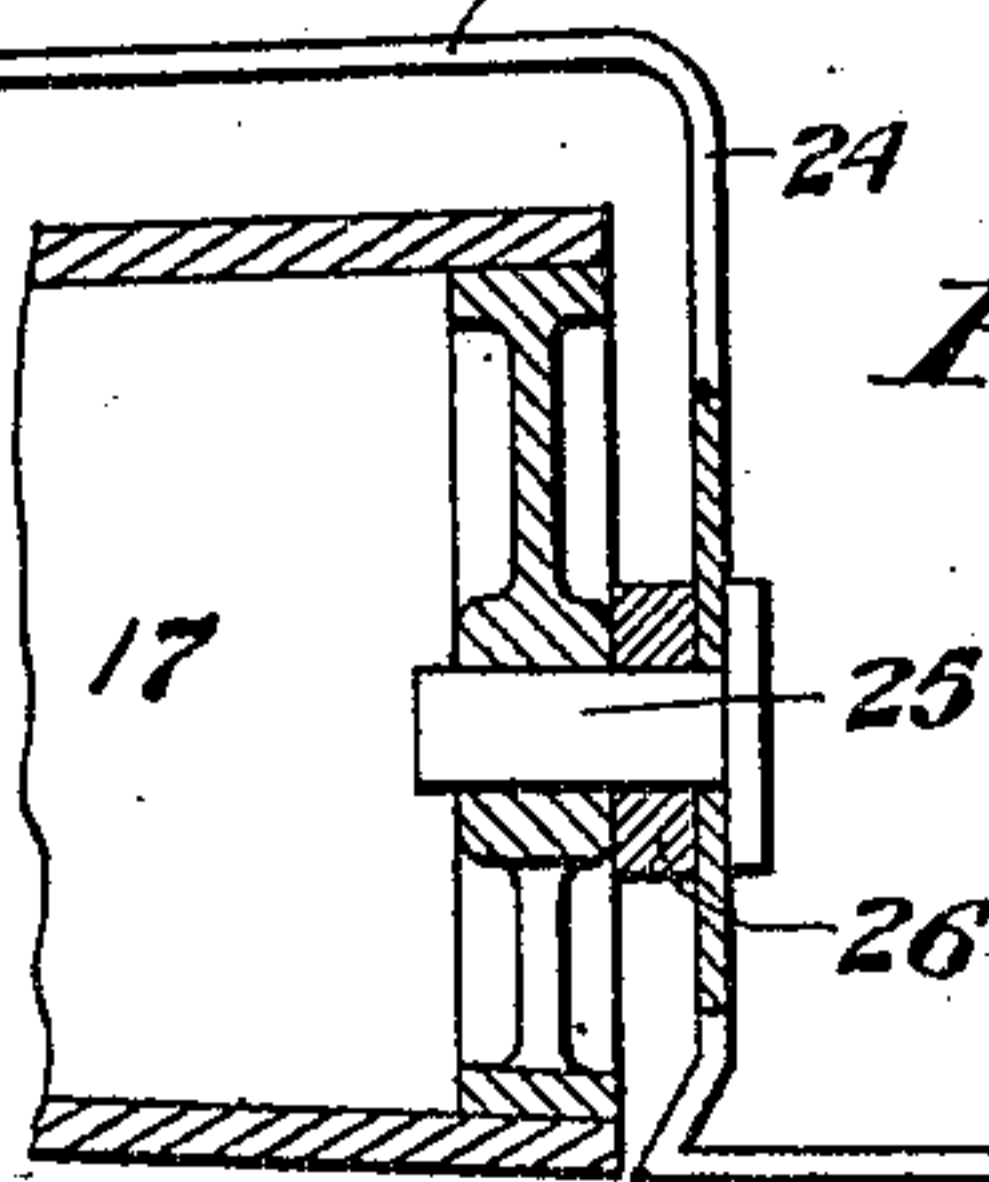
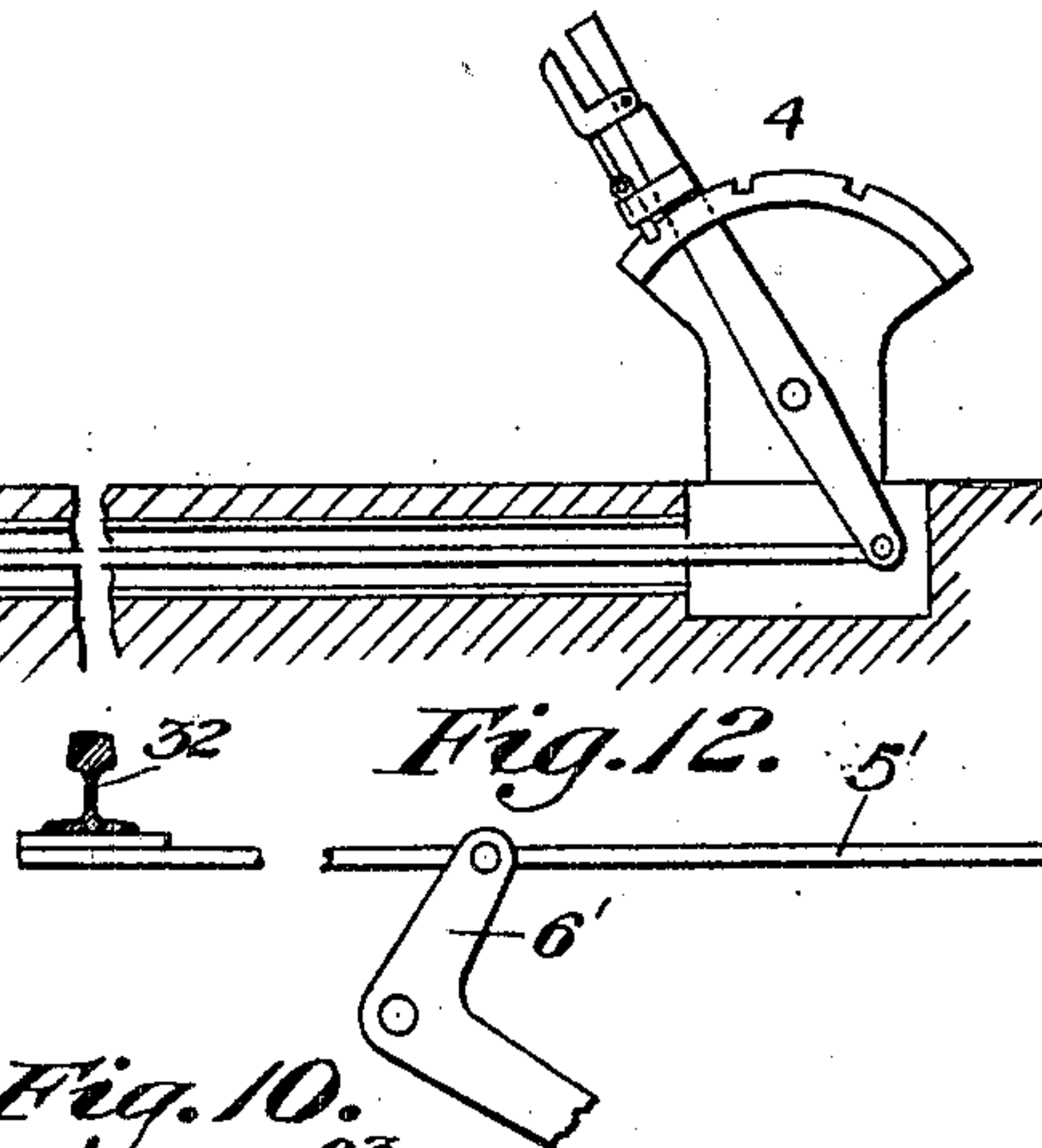
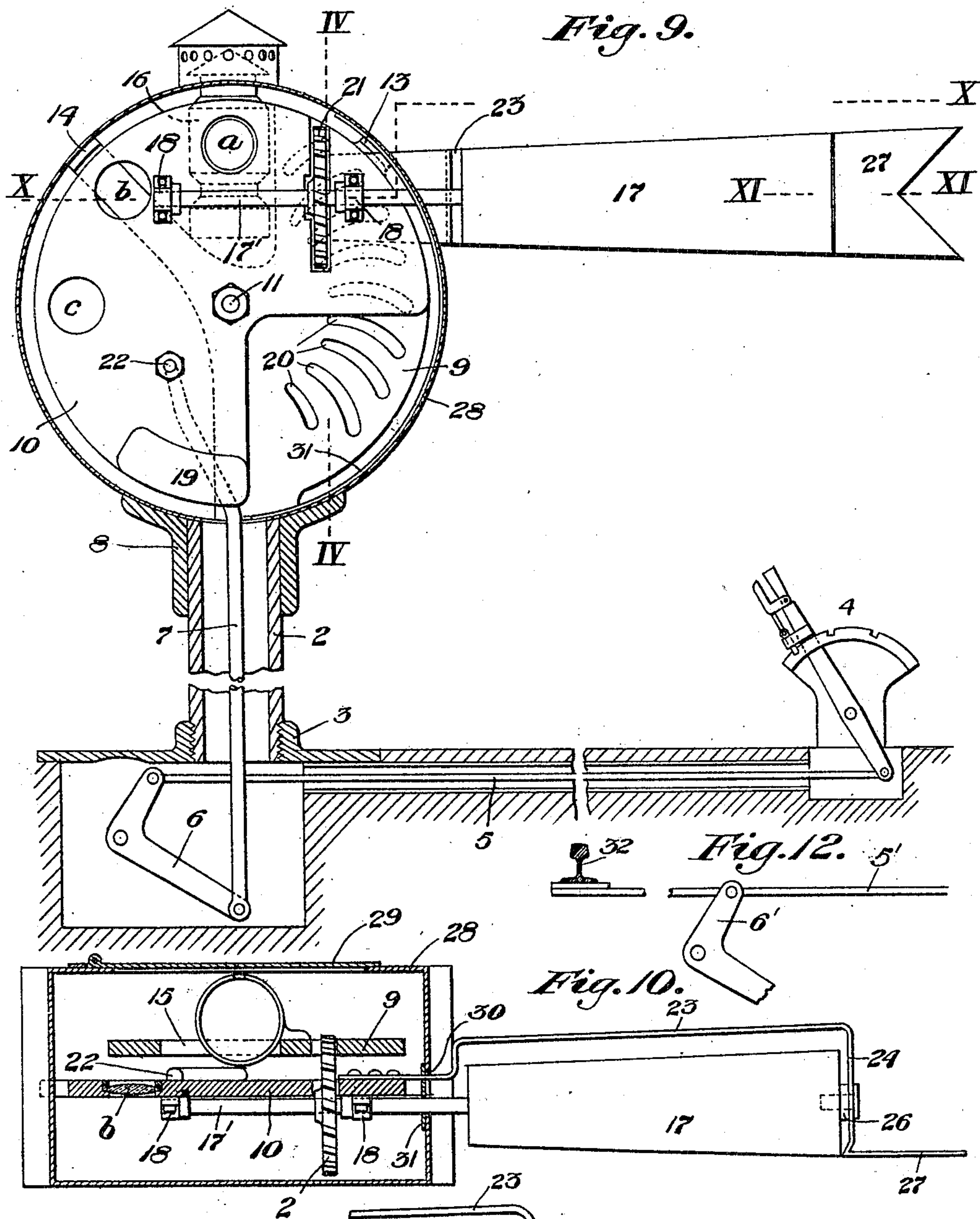
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2 SHEETS—SHEET 2.



Witnesses:

O. R. Rodd.

Chas. S. Sibley.

Inventor:

William A. Richardson

27th Oct. 1906
his Attorney

UNITED STATES PATENT OFFICE.

WILLIAM A. RICHARDSON, OF EDWARDSVILLE, ILLINOIS, ASSIGNOR TO
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SIGNAL.

No. 837,421.

Specification of Letters Patent.

Patented Dec. 4, 1906.

Application filed February 21, 1906. Serial No. 302,257.

To all whom it may concern:

Be it known that I, WILLIAM A. RICHARDSON, a citizen of the United States, residing at Edwardsville, in the county of Madison and State of Illinois, have invented certain new and useful Improvements in Signals, of which the following is a specification, reference being had therein to the accompanying drawings, forming part of the specification, in which—

Figure 1 is a view in front elevation of my improved signal indicating the danger position in horizontal arrangement and the "caution" and "clear" or safety positions in dotted lines. Fig. 2 is a view inside elevation of the device. Fig. 3 is an enlarged vertical sectional view indicated by the line III III of Fig. 1. Fig. 4 is a detail cross-sectional view indicated by the line IV IV of Fig. 9. Fig. 5 is a detail view, in front elevation, of the stationary rack-plate engaging the turning-wheel. Fig. 6 is a detail cross-sectional view on the line VI VI of Fig. 1. Fig. 7 is a similar view showing a modified form of shield. Fig. 8 is a detail sectional view of part of the case on the line VIII VIII of Fig. 2. Fig. 9 is a view in front elevation of the signal mechanism proper, the front of the case having been removed and illustrating in central vertical section the supporting hollow post and lever-actuating mechanism. Fig. 10 is a horizontal sectional view indicated by the line X X of Fig. 9. Fig. 11 is a detail sectional view showing the upper end of the signal-shield, bearing, &c., indicated by the line XI XI of Fig. 9. Fig. 12 is a detail view showing the connection of the operating-rod with a switch-point.

My invention refers to improvements in signals, more particularly that class of signals wherein a semaphore arm or paddle is pivotally mounted upon a suitable bearing at the upper portion of a supporting structure and, if desired, provided with a spectacle, frame extending beyond the other side of the pivotal bearing provided with lights adapted to register with the lamp in positions corresponding to the varying positions of the semaphore-blade.

The present invention relates particularly to the construction and mode of operation of the mechanism for mounting and actuating

the rotating swinging blade or paddle, and comprises improvements in that class of signaling mechanism illustrated in my prior patent, No. 761,787, dated June 7, 1904, and my prior application bearing the Serial No. 291,829.

Generally stated, the invention comprises a triangular-shaped rotating signal each face of which is preferably colored to suit the particular position which it will assume—for instance, red for "danger," yellow for "caution," and green for "safety."

The invention exemplifies a signal where absolute harmony and consistency between the various positions of the signal and the appropriate generally recognized indicating corresponding colors are secured and maintained throughout the operation of the signal. By providing absolute correspondence between color and position I dispense with any of the usual difficulties attendant upon the selection of any particular color for the blade.

The invention provides a signal perfectly consistent with flag-signals and does not require that trainmen must carry two or three systems in their memory.

It provides such a similarity of signals that all will be understood as soon as the significance of the signal-colors is known and makes it possible to adopt a system of unvariable signal-rules, while doing no violence to the accepted practice of signaling by position, all of the advantages of the "position" system being retained and supplemented by the equally important advantage or feature of color identification.

Other objects in view are to provide a compact mechanical construction capable of being mounted centrally above a supporting-post and inclosed within a symmetrical inclosing casing, wherein the signal-light and spectacle-frame glasses will always appear in the same central position when such are used and in which the semaphore-arm has ample freedom and space to assume the three different positions—to wit, horizontal, diagonal, and vertical—without interference with the frame.

The invention also refers to the construction of the obscuring-shield for the rotating blade and its incorporation therewith, as

well as to various other features or details of construction, as shall be more fully hereinafter described.

Referring now to the drawings, 2 represents the supporting-post upon which the signal apparatus is mounted, said post being preferably hollow and conveniently made of a metal pipe or tube mounted upon a suitable supporting-base 3 and in proper location for use with relation to the tracks of the road. The signal is set to the desired position by means of the usual lever mechanism 4, located at any convenient point along the right of way or in a signal-tower, from which mechanism by connections 5 and lever mechanism 6 a rod 7, mounted within the hollow post 2, is vertically actuated. It will be understood also that the rod 7 may be actuated by any other suitable or convenient mechanism or motor, and I do not wish to be limited to the construction shown.

Rigidly mounted at the upper portion of the supporting-post 2 upon any convenient base structure, as a flanged terminal 8, is the frame or plate 9, which constitutes a rigid supporting-base for the partially-rotating signal-carrying plate 10. This plate 10 is pivotally mounted upon bolt 11, secured at the central portion of frame 9 in a receiving-hole 12. The plate 9 is provided at points 13 and 14 with attaching flanges for the outer case, concentrically arranged with relation to the center 12 and is cut out for clearance at one side and also at the upper portion, as at 15, for the lantern 16.

17 is the swinging rotating signal, which may be triangular in form, as shown, or in box form to present four sides or merely a flat blade. The signal is mounted upon the outer end of rotatable shaft 17', mounted in bearings 18 18 on the front face of the tilting plate or frame 10. This frame combines the several glass lights *a*, *b*, and *c*, Fig. 9, thus embodying the usual spectacle-frame, and normally carries the rotating signal to danger position, as shown in Fig. 9, by means of a counterweight 19 at its lower portion. The advantage of such construction is that in case of breakage of the connections the signal will always come to "danger," while the counterweight also serves to overbalance the weight of the extending signal.

The stationary frame 9 is provided with a series of curved slots 20, into which engage the terminal teeth of wheel 21, secured upon shaft 17', whereby when the frame 10 is tilted a corresponding rotation is imparted to the triangular signal to expose the color corresponding to the position assumed. It will be seen that the shaft 17' is located considerably above the pivotal center 11 and that the axial center of the shaft is tangential to said center at a considerable radius away therefrom, whereby when the signal and shaft are in vertical position the shaft will hang verti-

cally at the same radial distance away from center 12. This arrangement is desirable for the reasons already stated, and for the purpose of providing an efficient actuating-gearing mechanism I have designed the arc-shaped slots 20, adapted to engage the teeth of wheel 21, which teeth are diagonally or otherwise formed at their points so as to correspond with the engaging angle of the slots at all times. Such series of slots perform the functions of a radial rack, but are much more efficient, and, as will be observed, they may increase in width outwardly, thus providing clearance for the entering and emerging teeth.

As the frame 10 is actuated by connecting-rod 7, connected to the frame at 22, the signal will be shifted to either caution or safety positions, as desired, and will be rotated to bring the correspondingly-colored face of the signal into position, which face will be flat and at right angles to the point of view of the approaching engineer when in its stationary position.

For the purpose of supporting the outer end of the signal 17 and also for the purpose of shielding the reverse side of the signal I employ a shield 23, of light sheet metal or other suitable material, secured at its inner end to the swinging frame 10, as shown, extending along back of the rotating signal, which it surrounds at the outer end, as at 24. The outer end of the signal is rotatably mounted upon an inwardly-extending stud 25, secured to the shield end 24, this portion of the shield being thus closely adjacent to the outer end of the rotating signal. The end bearing of the shaft projects inwardly a sufficient distance and is provided with a surrounding spacing-thimble 26, which thus effectually protects the outer bearing of the signal from the clogging effects of snow, sleet, or other foreign matter, thereby greatly facilitating the operation.

A feature of novelty and advantage in the present invention is the terminal wing 27 of the shield, which is so formed as to constitute an extension of the signal-blade. Such terminal may be of swallow-tail form, as shown in Fig. 9, or of any other desired form and suitably colored, as by painting it black, to form a distinguishing element of the entire signal mechanism.

The entire working apparatus with the exception of the signal-blade is inclosed within a circular surrounding case 28, preferably of sheet metal, provided with a swinging door 29 at one or both sides, by which access may be had to the interior and for the purpose of lighting or filling the lamp 16. The case 28 is slotted, as at 30, for clearance of the shield and signal-shaft, the rotating frame 11 having attached to it a sliding plate 31, arranged to cover the slot 30 inside at all positions. It will be seen that when thus constructed the

whole apparatus is very compact, well protected from the elements, and provides a symmetrical and mechanical device for the purposes in view.

5 In Fig. 7 I have shown in cross-section a construction employing a barrel-shaped shield 23', arranged to surround the triangular signal-blade at all sides except the front, whereby the signal is more completely pro-
10 tected from the elements. By this construction the flat face only is exposed at front and clearance is provided for free rotation.

In Fig. 12 I show the operating rod 5' extended beyond the connection with the oper-
15 ating-lever 6' and attached to a switch-point 32, whereby the switch and signal may be so connected as to always operate in unison.

It will be understood that changes or variations may be made in the design, construc-
20 tion, or various details by the skilled mechanic and that the same actuating mechanism may be employed in a double signal—*i. e.*, a signal having independent blades extending outwardly at opposite sides, which latter
25 will form the subject-matter of a later application. All obvious changes or variations, however, are to be included within the scope of the following claims.

What I claim is—

30 1. In a signal, the combination with a supporting-frame having a series of curved slots, of a centrally-pivoted swinging frame provided with a tangentially-arranged rotating signal-shaft and signal, and a toothed wheel
35 arranged to engage said series of slots, substantially as set forth.

2. In a signal, the combination with a supporting-frame having a series of curved slots, of a centrally-pivoted swinging frame pro-
40 vided with a tangentially-arranged rotating signal-shaft and signal, and a toothed wheel arranged to engage said series of slots, with mechanism for actuating said pivoted frame, substantially as set forth.

45 3. In a signal, the combination with a supporting-frame having a series of curved slots, of a centrally-pivoted swinging frame provided with a tangentially-arranged rotating signal-shaft and signal, and a toothed wheel
50 arranged to engage said series of slots, said frame being provided with lantern-lights, substantially as set forth.

4. In a signal, the combination with a stationary rack structure provided with a series
55 of radially-arranged curved teeth-engaging elements, of a pivoted swinging frame provided with a rotatable signal-shaft and signal, said shaft having a toothed wheel engaging said series of teeth-engaging elements,
60 substantially as set forth.

5. In a signal, the combination with a stationary rack structure provided with a series of radially-arranged curved teeth-engaging
65 vided with a rotatable signal-shaft and sig-

nal, said shaft having a toothed wheel engaging said series of teeth-engaging elements, with an obscuring-shield for the signal, substantially as set forth.

6. In a signal, the combination with a sta- 70
tionary rack structure provided with a series of radially-arranged curved teeth-engaging elements, of a pivoted swinging frame provided with a rotatable signal-shaft and signal, said shaft having a toothed wheel engag- 75
ing said series of teeth-engaging elements, with an obscuring-shield for the signal secured to the swinging frame and extending behind and beyond the signal, substantially as set forth. 80

7. In a signal, the combination with a stationary rack structure provided with a series of radially-arranged curved teeth-engaging elements, of a pivoted swinging frame provided with a counterweight and a rotatable 85
signal-shaft and signal, said shaft having a toothed wheel engaging said series of teeth-engaging elements, substantially as set forth.

8. In a signal, the combination with a stationary rack structure provided with a series 90
of radially-arranged curved teeth-engaging elements, of a pivoted swinging frame provided with a counterweight and lantern-lights and provided with a rotatable signal-shaft and signal, said shaft having a toothed 95
wheel engaging said series of teeth-engaging elements, substantially as set forth.

9. In a signal, the combination with a cylindrical slotted case having an inclosed stationary rack structure provided with a series 100
of radially-arranged curved teeth-engaging elements, of a pivoted swinging frame provided with a rotatable signal-shaft extending laterally through the slotted case and provided with an exterior signal, and an interior 105
toothed wheel engaging said series of teeth-engaging elements, substantially as set forth.

10. In a signal, the combination with a cylindrical slotted case having an inclosed stationary rack structure provided with a series 110
of radially-arranged curved teeth-engaging elements, of a pivoted swinging frame provided with a rotatable signal-shaft extending laterally through the slotted case and provided with an exterior signal, and an interior 115
toothed wheel engaging said series of teeth-engaging elements, with a cover-plate for the slot, substantially as set forth.

11. The combination with a pivoted swinging frame provided with a rotatable 120
signal-shaft and a signal connected therewith at one end, of an obscuring-shield secured to the swinging frame and provided with an end bearing for the signal, substantially as set forth. 125

12. The combination with a pivoted swinging frame provided with a rotatable signal-shaft and a signal connected therewith at one end, of an obscuring-shield secured to the swinging frame and provided with an 130

end bearing for the signal, said shield having an extension arranged to cooperate with the face of the signal, substantially as set forth.

13. The combination with a pivoted
5 swinging frame provided with a rotatable signal-shaft and a triangular signal connected therewith at one end, of a surrounding obscuring-shield secured to the swinging frame and arranged to cover and inclose two faces
10 of the signal, substantially as set forth.

14. The combination with a pivoted swinging frame provided with a rotatable signal-shaft and a triangular signal con-

nected therewith at one end, of a surrounding obscuring-shield secured to the swinging
15 frame and arranged to cover and inclose two faces of the signal, said shield having a flat extension arranged to cooperate with the face of the signal, substantially as set forth.

In testimony whereof I affix my signature 20
in presence of two witnesses.

WILLIAM A. RICHARDSON.

In presence of—

CHAS. S. LEPLEY,
C. M. CLARKE.