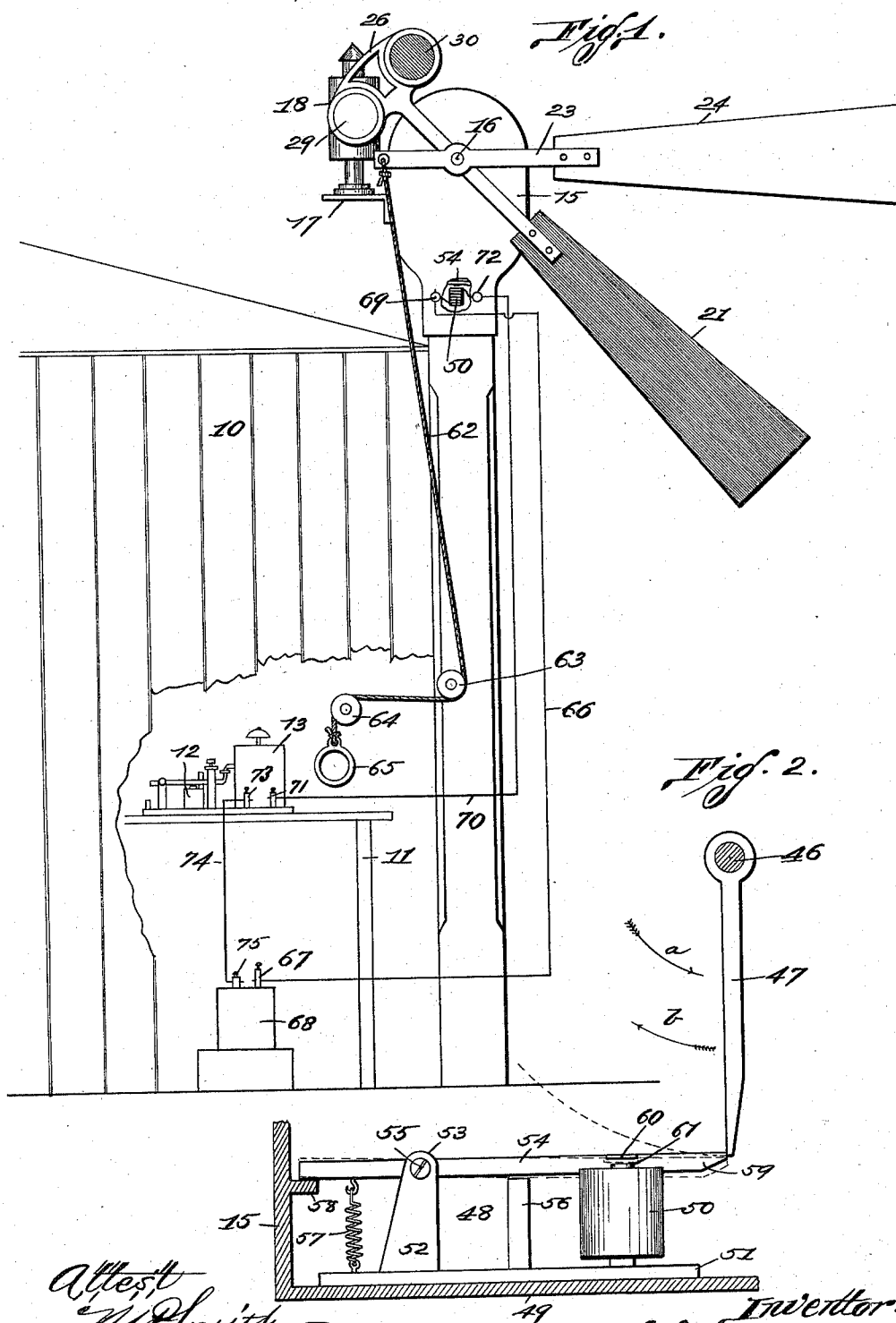


2 Sheets—Sheet 1.

ELECTRICALLY OPERATED SIGNAL OR SEMAPHORE.

Patented Mar. 23, 1897.



Attest
M. P. Smith.
S. G. Wells.

29 Inventor:-
J. N. Newsom
By Higdon Langan & Higdon Attys.

(No Model.)

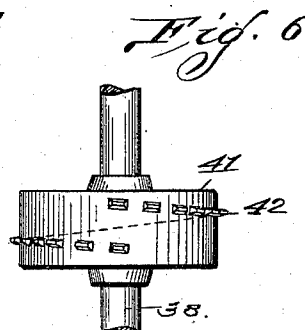
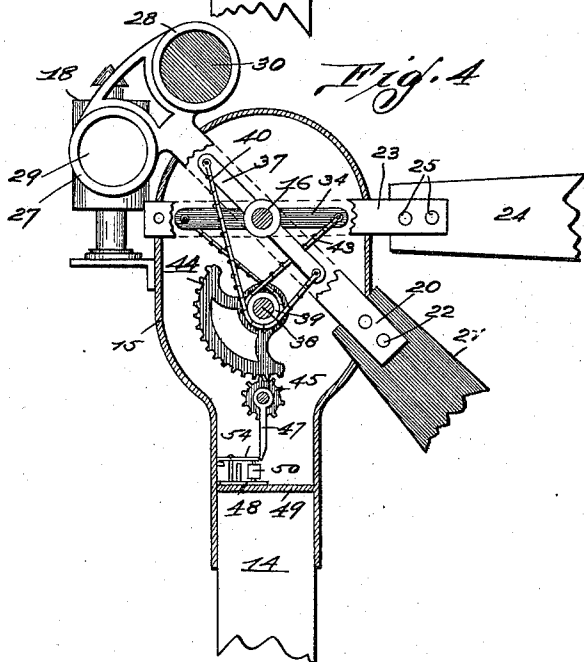
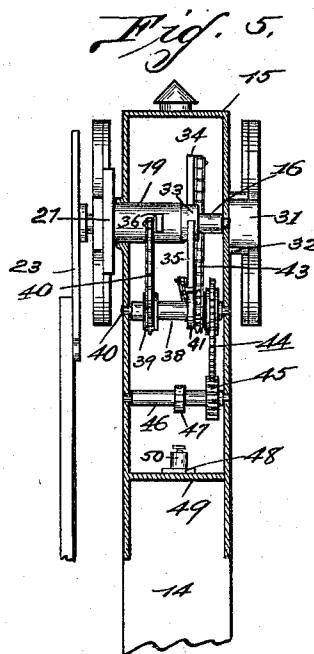
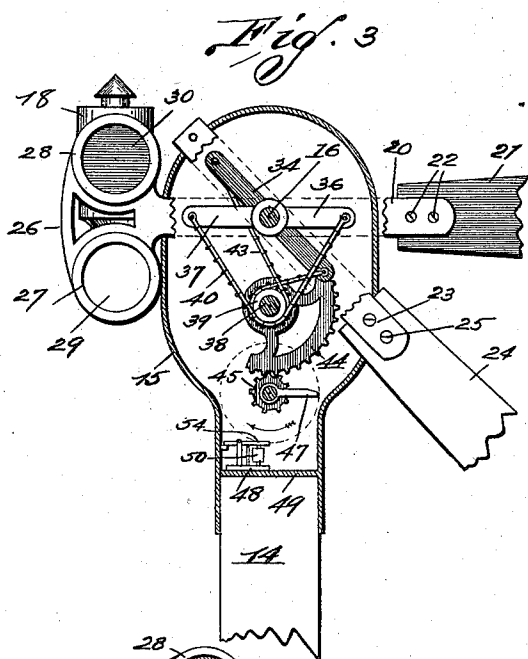
2 Sheets—Sheet 2.

J. N. NEWSOM.

ELECTRICALLY OPERATED SIGNAL OR SEMAPHORE.

No. 579,170.

Patented Mar. 23, 1897.



Attest
S. G. Wells

Inventor:
J. N. Newsom.

By Higdon, Hougan, & Higdon,
attys.

UNITED STATES PATENT OFFICE.

JOSEPH N. NEWSOM, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO
MICHAEL SUTTER, OF SAME PLACE.

ELECTRICALLY-OPERATED SIGNAL OR SEMAPHORE.

SPECIFICATION forming part of Letters Patent No. 579,170, dated March 23, 1897.

Application filed September 14, 1896. Serial No. 605,749. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH N. NEWSOM, of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Electrically-Operated Signals or Semaphores, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to electrically-operated signals or semaphores, and is supplemental to and should be read in connection with my former application, filed April 27, 1896, Serial No. 589,237, and pending concurrently herewith; and it consists in the novel construction, combination, and arrangement of parts hereinafter shown, described, and claimed.

Figure 1 is a diagrammatic view in elevation of the semaphore and a telegraph-office for the purpose of illustrating the use and operation of my present invention in connection with my invention shown, described, and claimed in my former application, above referred to. Fig. 2 is an enlarged detail view of the electromagnet of which I make use in operating the semaphore. Fig. 3 is a vertical sectional view of the mechanism for operating the semaphore, parts being broken away to more clearly illustrate the same, and the mechanism shown in the position it occupies when the danger-signal is displayed. Fig. 4 is a view similar to Fig. 3, showing the mechanism in the position it occupies before it has been operated to display the danger-signal. Fig. 5 is a vertical sectional view taken approximately on the indicated line 5 5 of Fig. 3. Fig. 6 is an enlarged detail view of a worm sprocket-wheel of which I make use.

I will describe my invention with special reference to its use upon a train-despatcher's circuit and in connection with way-stations as a means by which the train-despatcher may display the train-signals.

The telegraph-office 10 contains the usual operator's table 11, upon which is placed the operator's instruments, among which instruments is the sounder 12, to which is attached the telegraph call-bell 13, the details of which call-bell are shown and described in my former application, above referred to.

The post 14 should be mounted in a conspicuous position beside the railroad-track and also in a position convenient to the telegraph-office. Upon the upper end of the post 14 is mounted a casing 15, and the mechanism for operating the semaphore is contained within the casing 15. The shaft 16 is mounted in a horizontal position in the casing 15 and in a line approximately parallel with the railroad-track. A bracket 17 is attached to one side of the casing 15 and supports the bull's-eye lantern 18. A collar 19 is loosely mounted upon the shaft 16 and projects through one side of the casing 15, and upon the end of said collar 19, outside of the casing 15, is fixed a lever 20, and the blade 21 is attached to one end of said lever by means of the screws 22. The blade 21 is painted red and is designed to be operated as a danger-signal. Upon the outer end of the shaft 16 and adjacent to the lever 20 a lever 23, similar in every respect to the lever 20, is fixed to the shaft. The blade 24 is attached to one end of the lever 23 by means of the screws 25. The blade 24 is painted white and is designed to be used and operated as a safety-signal. The blades 21 and 24 are so operated that when the danger-signal is up the safety-signal is down, and vice versa.

Attached to the end of the lever 20, opposite the end to which the danger-signal is attached, is the frame 26, connecting the rings 27 and 28, which rings are mounted in vertical alinement with each other. The ring 27 carries the disk 29, of white glass, and the ring 28 carries the disk 30, of red glass. The disks 29 and 30 are in such a position relative to the lantern 18 that when the danger-signal is displayed in a horizontal position the red disk 30 will be in front of the lantern, causing the lantern to display a red light, and when the safety-signal 24 is in a horizontal position the white disk 29 will be in front of the lantern, causing the lantern to display a white light.

A frame 31 is mounted upon the opposite side of the lantern 18 from the frame 26, and a horizontal bar 32 connects the frame 31 with the frame 26. The frame 31 is identical in every respect with the frame 26 and carries a white disk corresponding to the white disk 29

and a red disk corresponding to the red disk 30. By this construction the signal-lights are displayed in both directions.

A collar 33 is fixed upon the shaft 16 and against the inner end of the collar 19. Arms 34 and 35 project from opposite sides of the collar 33 in alinement with each other and in positions parallel with the lever 23. Arms 36 and 37 project from opposite sides of the collar 19 in alinement with each other and in positions parallel with the lever 20.

The shaft 38 is mounted in the casing 15 directly below the shaft 16 and in position parallel with said shaft. A sprocket-wheel 39 is mounted upon the shaft 38 and rigidly fixed thereto, and a chain 40 has one of its ends attached to the free end of the arm 36 and passes under the sprocket-wheel 39 and in engagement therewith, and the opposite end of said chain is fixed to the free end of the arm 37.

A worm sprocket-wheel 41 is mounted upon the shaft 38 in alinement with the ends of the arms 34 and 35. The sprocket-wheel 41 is shown in detail in Fig. 6. The distinguishing feature of this sprocket-wheel is the fact that the teeth 42 are arranged spirally around the wheel, the object being that the chain may be wound entirely around the wheel and crossed.

The chain 43 has one of its ends attached to the free end of the arm 34, and said chain passes under the sprocket-wheel 41 in engagement therewith and entirely around said sprocket-wheel, and its opposite end is attached to the free end of the arm 35. The object of this construction is to operate the levers 20 and 23 in opposite directions by the operation of the shaft 38.

A segmental spur-gear 44 is mounted upon the shaft 38 and fixed thereto and meshes with the spur-pinion 45, which is mounted upon and fixed to the shaft 46, which shaft 46 is mounted in the casing 15 below the shaft 38 and in position parallel with said shaft 38. An arm 47 is mounted upon the shaft 46, and an electromagnet 48 is mounted upon the plate 49 in position to have the free end of its armature engaged by the free end of the arm 47, as shown in Fig. 2. The plate 49 is horizontally positioned on top of the post 14 and within the casing 15.

The construction of the electromagnet 48 is similar to that of an ordinary telegraph-sounder, and it consists of the magnet-coils 50, arranged in vertical position upon the base 51, which base rests upon the plate 49. The post 52 extends upwardly from the base 51 and some distance from the coils 50, and the upper end of said post 52 is bifurcated, forming the ears 53, between which the armature 54 is pivotally mounted by means of the screw 55. A post 56 extends upwardly from the base 51 in a position approximately halfway between the post 52 and the coils 50, and said post 56 is of such a length that the armature 54 will rest upon the upper end of said

post when the magnets 50 have attracted said armature. A coil-spring 57 connects the end of the armature 54 opposite the magnet with the base 51 and operates to raise the armature 54 away from the post 56. A lug 58, formed upon the inner face of the casing 15, acts as a stop to limit the downward motion of the end of the armature 54, which end is opposite the magnet.

The free end 59 of the armature 54 operates between the upper ends of the magnet-coils 50, and the cross-bar 60, attached to said armature, engages the end of the core 61 of the magnet-coils. When the magnet-coils are not electrically energized, the coil-spring 57 raises the cross-bar 60 away from the cores 61. A cord 62 is attached to the end of the lever 23 opposite the end to which the blade 24 is attached, and said cord passes downwardly under the grooved pulley 63, thence through the wall of the telegraph-office and over the grooved pulley 64, and the ring 65 is attached to the lower end of said cord.

When it is desired to display the safety-signal, the operator engages the ring 65 and pulls the cord 62, thus raising the blade 24 and lowering the blade 21. This operation also raises the red disk 30 out of alinement with the lantern 18 and places the white disk 29 in alinement with said lantern. This operation rotates the shaft 46, carrying the arm 47, in the direction indicated by the arrow *a* in Fig. 2, and the free end of said arm 47 engages the free end 59 of the armature 54 and is held in a vertical position, as shown in Fig. 2. When the magnet-coils 50 are electrically energized, the bar 60 is attracted to the cores 61, and the free end 59 of the armature moves downwardly out of engagement with the arm 47 and allows the shaft 46, carrying said arm 47, to be rotated in the direction indicated by the arrow *b*. By this operation the mechanism within the casing 15 is released, and the frames 26 overbalance the blade 21 and cause said blade 21 to be raised to a horizontal position and the blade 24 to descend, and the frames 26 descend, bringing the red disk 30 into alinement with the lantern 18.

The call-bell 13 is constructed upon the principles shown and described in my former application, above referred to, and the electromagnet 50 is placed in the "bell-circuit" of the call-bell, and said bell-circuit is operated as shown and described in my former application.

The wire 66 has one of its ends attached to the binding-post 67 of the local battery 68, and said binding-post is electrically connected to one of the poles of the battery. The opposite end of said wire 66 is attached to the binding-post 69, which binding-post is attached to the casing 15 and is electrically connected to one of the coils 50 of the electromagnet 48. The wire 70 has one of its ends attached to the binding-post 71, which is attached to the call-bell 13, and its opposite end is attached to the binding-post 72, which

is attached to the casing 15 and is electrically connected with the coils 50. The binding-post 73 is attached to the call-bell 13, and the binding-posts 71 and 73 are connected by the bell-circuit, as described in my former application.

The wire 74 leads from the binding-post 73 to the binding-post 75, which is electrically connected with the opposite pole of the battery 68 from the pole to which the binding-post 67 is connected.

When the telegraph-sounder 12 is operated to operate the call-bell, the electromagnet 48 will also be operated to release the semaphore mechanism and display the danger-signal. When it is desired to display the safety-signal, the operator pulls the cord 62, as before suggested.

I claim—

1. In a semaphore, a shaft rotatably mounted in a horizontal position, a collar fixed upon said shaft, arms projecting from said collar in opposite directions, a collar loosely mounted upon said shaft, arms projecting from said loose collar in opposite directions, a lever mounted upon the outer end of said loose collar, signals upon the ends of said lever, a lever upon the outer end of said shaft, a signal attached to one end of said lever, and connections between said shaft and said loose collar, whereby said levers are operated in opposite directions, substantially as specified.

2. In a semaphore, a shaft rotatably mounted, a collar loosely mounted upon one end of said shaft, a lever fixed to said collar, a lever fixed to said shaft, signals upon corresponding ends of said levers, connections between said levers, and electrically-controlled mechanism whereby said levers are operated in opposite directions, substantially as specified.

3. In a semaphore, a suitable casing, a shaft rotatably mounted in said casing, a lantern at one side of said casing, a collar loosely mounted upon said shaft, a lever fixed to said collar, a lever fixed to said shaft, frames fixed to one end of one of said levers and carrying glass disks in position to come upon opposite sides of said lantern, signals upon the opposite ends of said levers from said lantern, connections between said levers whereby they are operated in opposite directions and electrically-controlled mechanism for operating and holding said levers, substantially as specified.

4. In a semaphore, a suitable casing, a shaft rotatably mounted in a horizontal position in said casing, a collar fixed to said shaft, arms projecting in opposite directions from said collar, a collar loosely mounted upon said shaft, arms projecting in opposite directions from said loose collar, a second shaft mounted in a position parallel with said first-mentioned shaft, a sprocket-wheel upon said second shaft, a chain connecting the free ends of the arms upon said loose collar, and engaging said sprocket-wheel, a worm sprocket-wheel upon the second-mentioned shaft, a chain connecting the free ends of the first-men-

tioned arms and passing around said sprocket-wheel in such a way that said shaft and said loose collar will be operated in opposite directions by the operation of the second shaft, substantially as specified.

5. In a semaphore, a suitable casing, a shaft rotatably mounted in a horizontal position in said casing, a collar fixed to said shaft, arms projecting in opposite directions from said collar, a collar loosely mounted upon said shaft, arms projecting in opposite directions from said loose collar, a second shaft mounted in a position parallel with said first-mentioned shaft, a sprocket-wheel upon said second shaft, a chain connecting the free ends of the arms upon said loose collar, and engaging said sprocket-wheel, a worm sprocket-wheel upon the second-mentioned shaft, a chain connecting the free ends of the first-mentioned arms and passing around said sprocket-wheel in such a way that said shaft and said loose collar will be operated in opposite directions by the operation of the second shaft, a segmental gear upon said second shaft, a third shaft mounted in a position parallel with said second shaft, a pinion upon said third shaft meshing with said segmental gear, an arm upon said third shaft, and an electromagnet in position to have the free end of its armature engaged by said arm, substantially as specified.

6. In a semaphore, a suitable casing, a shaft rotatably mounted in a horizontal position in said casing, a collar fixed to said shaft, arms projecting in opposite directions from said collar, a collar loosely mounted upon said shaft, arms projecting in opposite directions from said loose collar, a second shaft mounted in a position parallel with said first-mentioned shaft, a sprocket-wheel upon said second shaft, a chain connecting the free ends of the arms upon said loose collar and engaging said sprocket-wheel, a worm sprocket-wheel upon the second-mentioned shaft, a chain connecting the free ends of the first-mentioned arms and passing around said sprocket-wheel in such a way that said shaft and said loose collar will be operated in opposite directions by the operation of the second shaft, a segmental gear upon said second shaft, a third shaft mounted in a position parallel with said second shaft, a pinion upon said third shaft meshing with said segmental gear, an arm upon said third shaft, an electromagnet in position to have the free end of its armature engaged by said arm, a lever attached to the outer end of said loose collar, a lever attached to the outer end of said shaft and beside the first-mentioned lever, and signals attached to the ends of said levers, substantially as specified.

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

JOSEPH N. NEWSOM.

Witnesses:

M. P. SMITH,

MAUD GRIFFIN.