

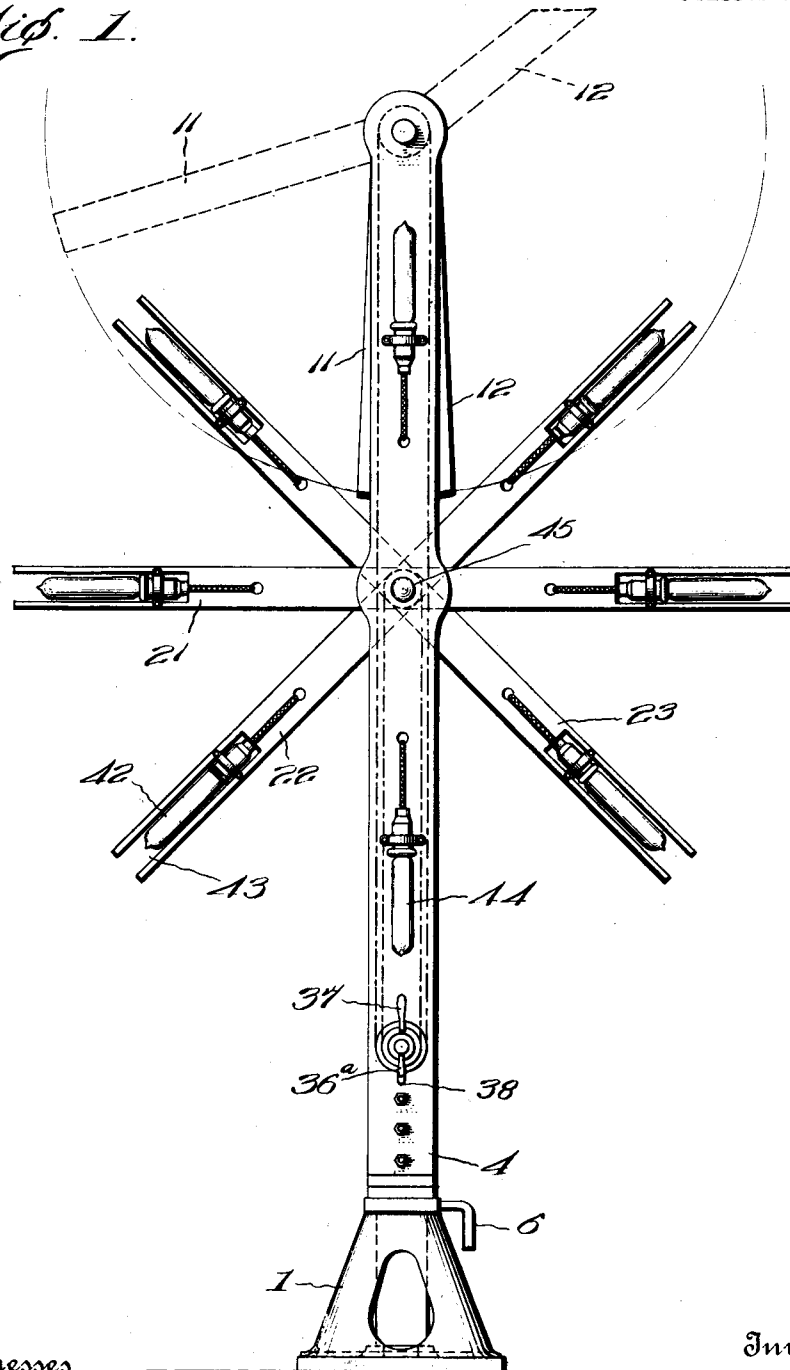
A. C. KAIL.
 SIGNALING MACHINE.
 APPLICATION FILED OCT. 17, 1911.

1,047,069.

Patented Dec. 10, 1912.

4 SHEETS—SHEET 1.

Fig. 1.



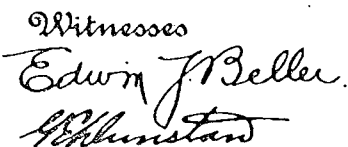
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4 SHEETS-SHEET 2.



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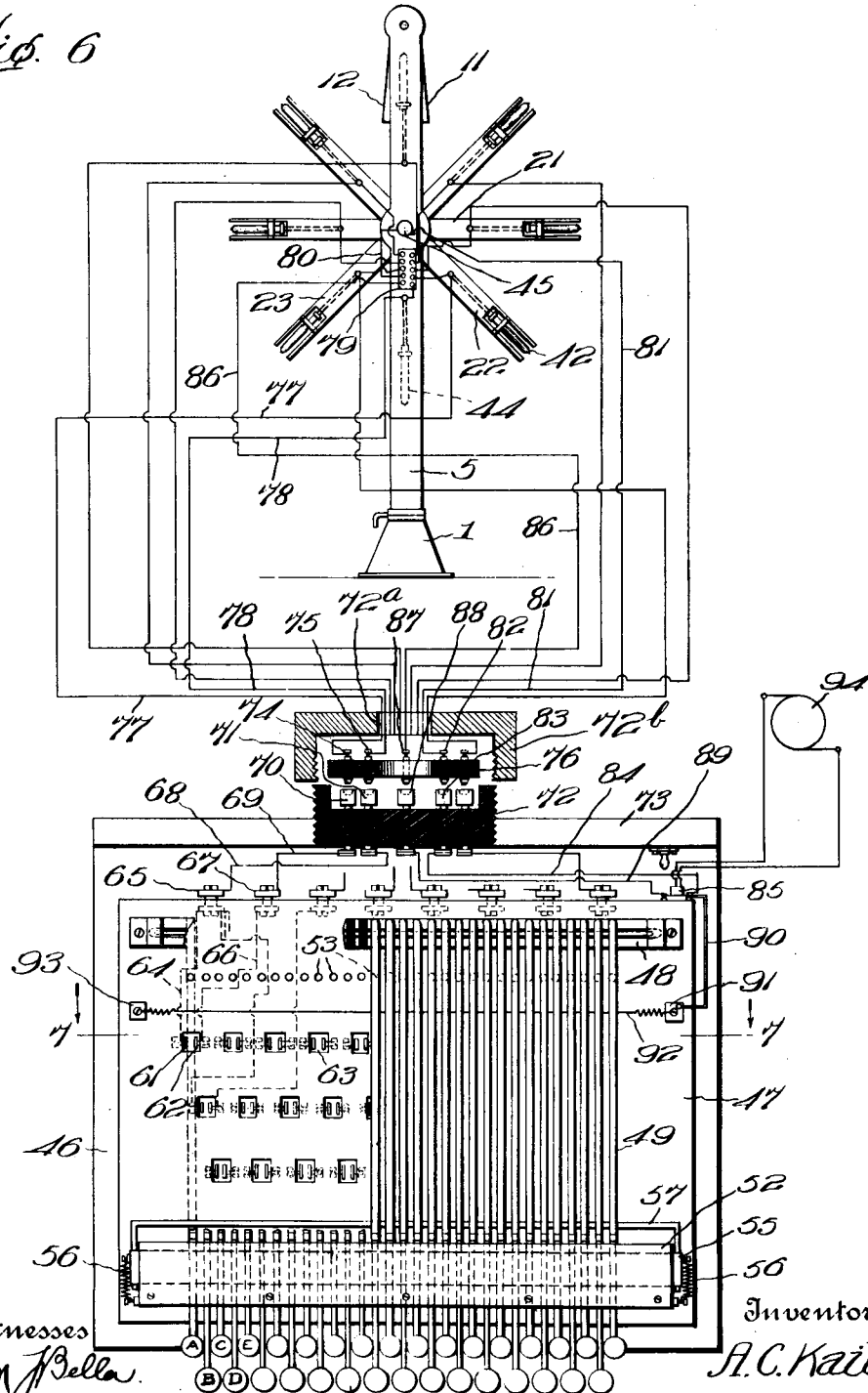
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4 SHEETS—SHEET 3.

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Fig. 6



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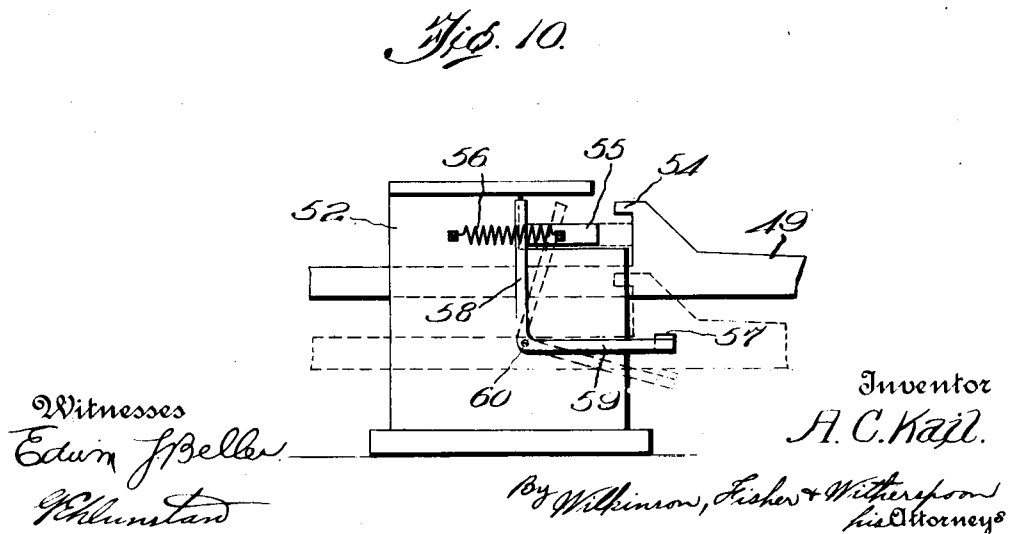
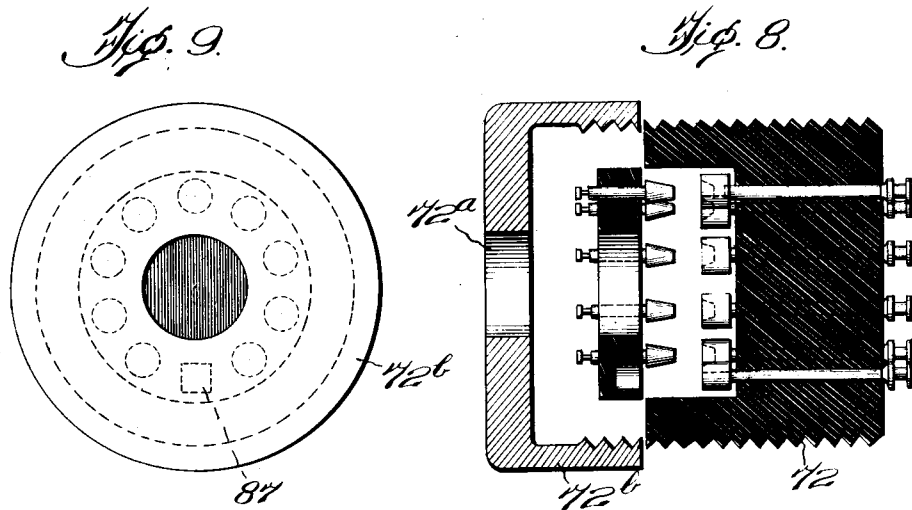
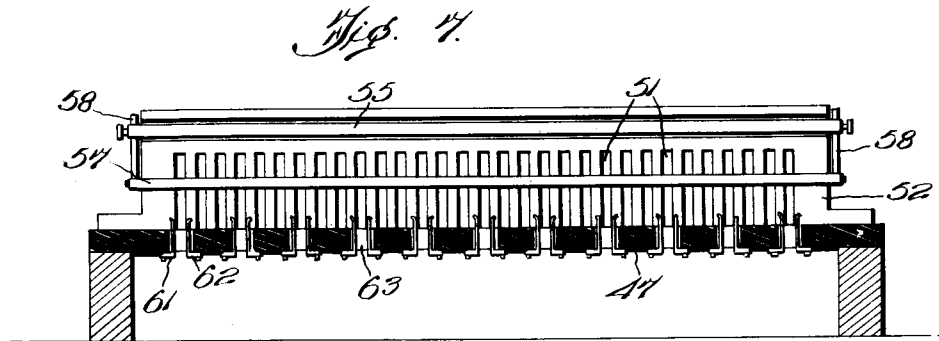
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4 SHEETS—SHEET 4.



UNITED STATES PATENT OFFICE.

ARTHUR CLIFTON KAIL, OF THE UNITED STATES NAVY.

SIGNALING-MACHINE.

1,047,069.

Specification of Letters Patent.

Patented Dec. 10, 1912.

Application filed October 17, 1911. Serial No. 655,186.

To all whom it may concern:

Be it known that I, ARTHUR C. KAIL, lieutenant, of the United States Navy, a citizen of the United States, at present attached to U. S. S. *Philadelphia*, have invented certain new and useful Improvements in Signaling-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in semaphore signaling machines, and has for its main object to provide means for signaling both in the day time and also at night.

Another object of the invention is to provide a plurality of lamps carried by arms arranged in such a manner as to make the letters of the semaphore alphabet according to a particular series of lamps operated.

A further object is to operate each series of lamps from a keyboard by using a single key.

With the above and other objects in view, the invention consists in certain combinations and arrangements of the parts hereinafter described, and the novel features thereof will be particularly pointed out in the appended claims.

In order that the invention may be understood, same will be fully described in connection with the accompanying drawings illustrating a preferred embodiment thereof, and in the drawings, like characters of reference indicate corresponding parts.

Figure 1 is a front elevation of a signaling machine, constructed in accordance with my invention; Fig. 2 is a vertical sectional view of Fig. 1, the signaling arms being in folded or inoperative positions; Fig. 3 illustrates a fragmental portion in section and elevation of the day signaling arms, and the means carrying same; Fig. 4 shows similar views of the means carrying the night signaling arms; Fig. 5 shows in section and end elevation the means for operating the day and also the night signaling arms; Fig. 6 illustrates the signaling machine, looking at the rear elevation thereof, connected to the keyboard shown in plan, part of the keyboard being broken away and the contact plug shown in section and the parts separated to more clearly show the construction; Fig. 7 is a transverse section of the keyboard, on an enlarged scale, taken on line 7-7, Fig. 6; Fig. 8 is a sectional

view, on an enlarged scale, of the contact plug, the parts being shown in separated positions; Fig. 9 is an end view of same; and, Fig. 10 is a side elevation of the forward end of the keyboard, showing the means for locking the other keys when one is operated.

The semaphore machine consists of a base 1 in which is rotatably mounted a pivot post 2, to the head 3 of which is fixed an upwardly projecting front side 4 and a corresponding rear side 5. Means for locking the pivot post against rotation is shown at 6. A short shaft 7 is supported by the front and rear sides 4 and 5 at their upper ends, and a plurality of sprocket wheels 8 and 9 having extending bosses 10 are mounted on the shaft between said sides. Day arms 11 and 12 are fixed to the bosses of the sprocket wheels and counterbalance weights 13 carried by their shorter ends. A separating sleeve 14 is interposed on the shaft 7 between the sprocket wheels.

Journaled in the front and rear sides 4 and 5 centrally of their ends is a spindle 15, to which is keyed a sprocket wheel 16. To the spindle 15 is secured a cupped disk 17 and loosely supported by the spindle are similar cupped disks 18 and 19. Said cupped disks have laterally oppositely extending flanges 20 to which are centrally connected night arms 21, 22 and 23, respectively. Hard wooden bearing blocks 24 are fitted within said disks and a washer 25 prevents longitudinal movement of the disks on the spindle. The night arms are caused to assume their proper positions for night signaling upon rotation of the sprocket wheel 16 as follows. The arm 21 and disk 17 are provided with an aperture 26, while the arm 22 and disk 18 are provided with a curved slot 27, and the arm 23 and disk 19 with a similar slot 28, except that it is longer. A pin 29 projects inwardly from the sprocket wheel 16 into the aperture 26 and curved slots 27 and 28, and when the sprocket wheel is suitably rotated, the pin 29 will move the disks 18 and 19 correspondingly less than the disk 17 according to the free movement allowed the pin in their curved slots, and the arms 21, 22 and 23 will take the position shown in Figs. 1 and 2. By rotating the sprocket wheel 16 in the reverse direction, the night arms will be returned to their folded positions.

A shaft 30 is journaled in the lower portion of the rear side 5, and fixed thereto is

a sleeve 31 which carries a sprocket wheel 32 on its rear end. A sleeve 33 having at its rear end a sprocket wheel 34 is rotatably mounted on the first sleeve, and a short sleeve 35 having fixed to its rear end a sprocket wheel 36 is loosely mounted on the forward end of the second sleeve 33. The sleeve 35 is journaled in the front side 4, and to the forward projecting ends of the shaft 30, and to the sleeves 33 and 35 are fixed handles 36^a, 37 and 38 respectively. The sprocket wheels 8 and 9 of the day arms are connected by sprocket chains 39 and 40 to the sprocket wheels 32 and 36, and the sprocket wheel 16 to the sprocket wheel 34 by a chain 41. The arms 11 and 12 are manually operated to give the ordinary signals during day time, as illustrated by dotted lines, Fig. 1, by rotating the handles 36^a and 38, and the night arms 21, 22 and 23 are caused to take their proper positions for night signaling by rotating the handle 37. When one set of arms is in operation, the other set is folded within the front and rear sides 4 and 5.

The semaphore alphabet for night signals is produced by means of electric lamps 42 carried by the bifurcated ends 43 of the night arms 21, 22 and 23, similar lamps 44 fastened to the front side 4 and a central lamp 45 on the front side at the pivotal point of the night arms. The different letters are indicated by the lighting of certain combinations or series of lamps, which is controlled from a keyboard.

The keyboard consists of a base 46 of insulating material which supports a platform 47 carrying at its rear end a key bearing 48, to which is pivotally connected a plurality of key levers 49 having at their front ends key caps 50, which are provided with different letters of the alphabet. Each of the levers 49 is constructed of highly conductive metal to close a circuit therethrough, as will be understood. The forward end portions of the key levers slide in vertical slots 51 of a guide 52, and coil springs 53 interposed between the key levers and the platform in proximity to the bearing 48 keep the key levers in normal elevated positions. In order to prevent the operating of the other key levers when one is operated, each key lever is provided with a projection or hook 54, and the key lever guide 52 with a sliding bar 55 which is normally held out of the path of the hooks by means of springs 56 connected to the ends thereof and to the guide. When one of the key levers is pressed downwardly, a bar 57 extending under all of the key levers is adapted to be engaged thereby and moved downwardly, and the upwardly extending arms 58 of a pair of bell cranks 59 pivoted to the ends of the guide at 60 cause the sliding bar to move under the hooks of the other

levers. Pairs of spring contacts 61 and 62 project upwardly through apertures 63 of the platform 47, and are adapted to be engaged by the key levers 49 to close the circuit for operating two of the signaling lamps.

The spring contact 61 is connected by a wire 64 to a terminal 65 carried by the keyboard, and the other spring contact 62 of the pair is connected by a wire 66 to a similar terminal 67. From these terminals lead wires 68 and 69 which are connected to terminals 70 and 71 of the keyboard contact plug 72 fixed in a frame 73 projecting from the base 46. Corresponding terminals 74 and 75 of the signaling machine contact plug 76 register with the terminals 70 and 71, and from said terminals extend wires 77 and 78 leading through a central opening 72^a in the contact plug cap 72^b to the lamps 42 and 44, which are connected by wires to a feeder box 79 carried by the rear side 5 of the signaling machine. The other lamps, except the central lamp 45, are similarly connected to the other key levers. The central lamp is connected to the feeder box by a wire 80, and from said lamp extends a wire 81 which leads to a terminal 82 registering with its corresponding terminal 83, from which extends a wire 84 to a socket plug 85 carried by the keyboard. Leading from the feeder box 79 is a wire 86 which extends to a terminal 87 registering with its corresponding terminal 88 which is connected by a wire 89 to the socket plug 85. A wire 90 connects the socket plug to a contact 91, at one side of the base 46, from which contact extends a wire 92 passing beneath all the key levers to a contact 93 at the other side of the base. The wire 90 is adapted to be engaged by the key levers when operated to complete the lamp circuits. The socket plug 85 may be connected with any suitable source of electrical energy, as indicated at 94.

The operation is as follows:—During the day time, the arms 11 and 12 are set at the usual different angles for signaling, as shown in dotted lines, Fig. 1, by rotating the handles 36^a and 38, and at night are folded within the front and rear sides 4 and 5 of the signaling machine. The arms 21, 22 and 23 are then set to the position shown in Figs. 1 and 2 by rotating the handle 37.

By pressing downwardly on one of the key caps, for instance A, the key lever engages the spring contact 61 and 62 which closes the following circuit and causes the central lamp 45 and the lamps 42 and 44 to burn for indicating the letter A of the semaphore alphabet. The electric current travels from 94 to the socket plug 85, and through 89, 82, 87 and 86 to the feeder box 79, through the lamp 44, 78, 75, 71, 68, 65, 64, 61, the operated key lever, 62, 66, 67, 69, 70, 130

74, 77, the lamp 42 and back to the feeder box 79. From 79 through 80 to the central lamp 45, through 81, 82, 83 and 84 to the socket plug 85, then through 90, 91, the wire 5 92 and back again to the key lever. The other key levers are similarly connected up with the lamps and it will be apparent that by operating any particular key lever, the series of lamps indicating the corresponding letter will be lighted. When one key lever 10 is operated, the others are locked against downward movement by forcing the sliding bar 55 under the hooks 54 of the other key levers.

15 Although the elements set forth and described are well adapted to accomplish the purposes for which they are intended, it is to be understood that slight changes in the details of construction and arrangements of the parts may be resorted to without sacrific- 20 ing any of the advantages or departing from the spirit of the invention.

Having fully described my invention, what I claim is:—

25 1. In a signaling machine, the combination of a support, arms pivotally connected at their centers to the support, means for moving the arms in succession to cause the same to form angles with said support; 30 lamps mounted on said support; lamps carried by the arms at either end thereof; and means for operating the lamps to indicate a signal, substantially as described.

35 2. In a signaling machine, the combination of a front side and a rear side, intersecting arms arranged between the sides and pivotally connected thereto at their centers,

means for rotating the arms in succession and causing them to assume angles with said sides, a central lamp carried by the front side at the pivotal point of the arms, 40 lamps arranged on the front side above and below the central lamp, lamps fixed to the arms at either end thereof, and means for operating the central lamp and two of the 45 other lamps to indicate a signal, substantially as described.

3. In a signaling machine, the combination of a front side and a rear side, a spindle journaled in the sides, a sprocket wheel 50 fixed to the spindle, a plurality of disks loosely mounted on the spindle, one of the disks having an aperture and the other disks being provided with curved slots of different lengths in alinement therewith, a pin pro- 55 jecting from the sprocket wheel through the aperture and said slots, arms carried by the disks, means for rotating the sprocket wheel to cause the arms to arrange themselves at angles with said sides, a central lamp car- 60 ried by the front side at the pivotal point of the arms, lamps arranged on the front side above and below the central lamp, lamps fixed to the arms, and means for operating the central lamp and two of the other lamps 65 to indicate a signal, substantially as described.

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

ARTHUR CLIFTON KAIL.

Witnesses:

W. J. MOSES,
F. T. RYAN.