

No. 776,629.

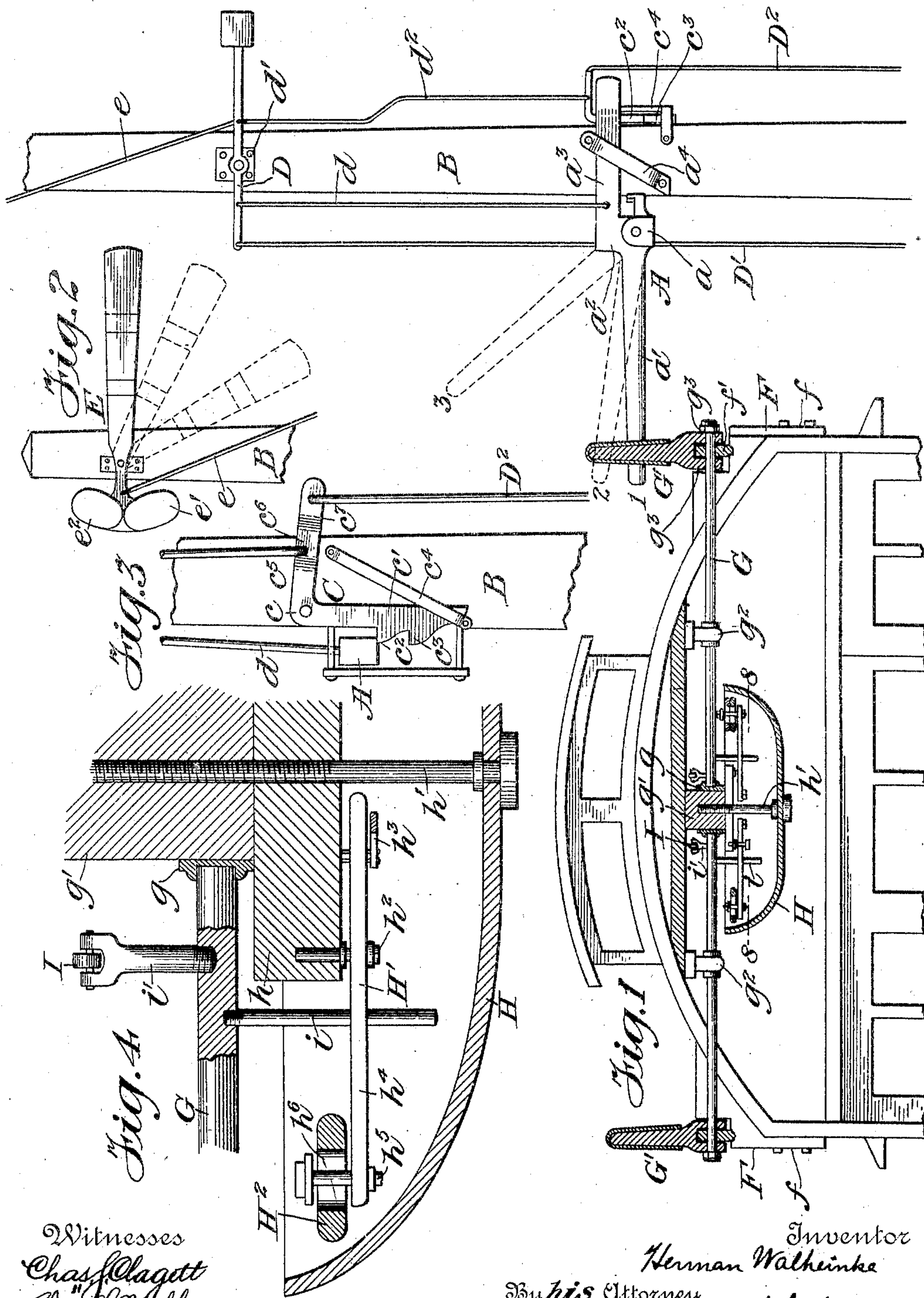
PATENTED DEC. 6, 1904.

H. WALHEINKE.
RAILROAD SIGNAL APPARATUS.

APPLICATION FILED MAR. 24, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses
Chas. Clagett
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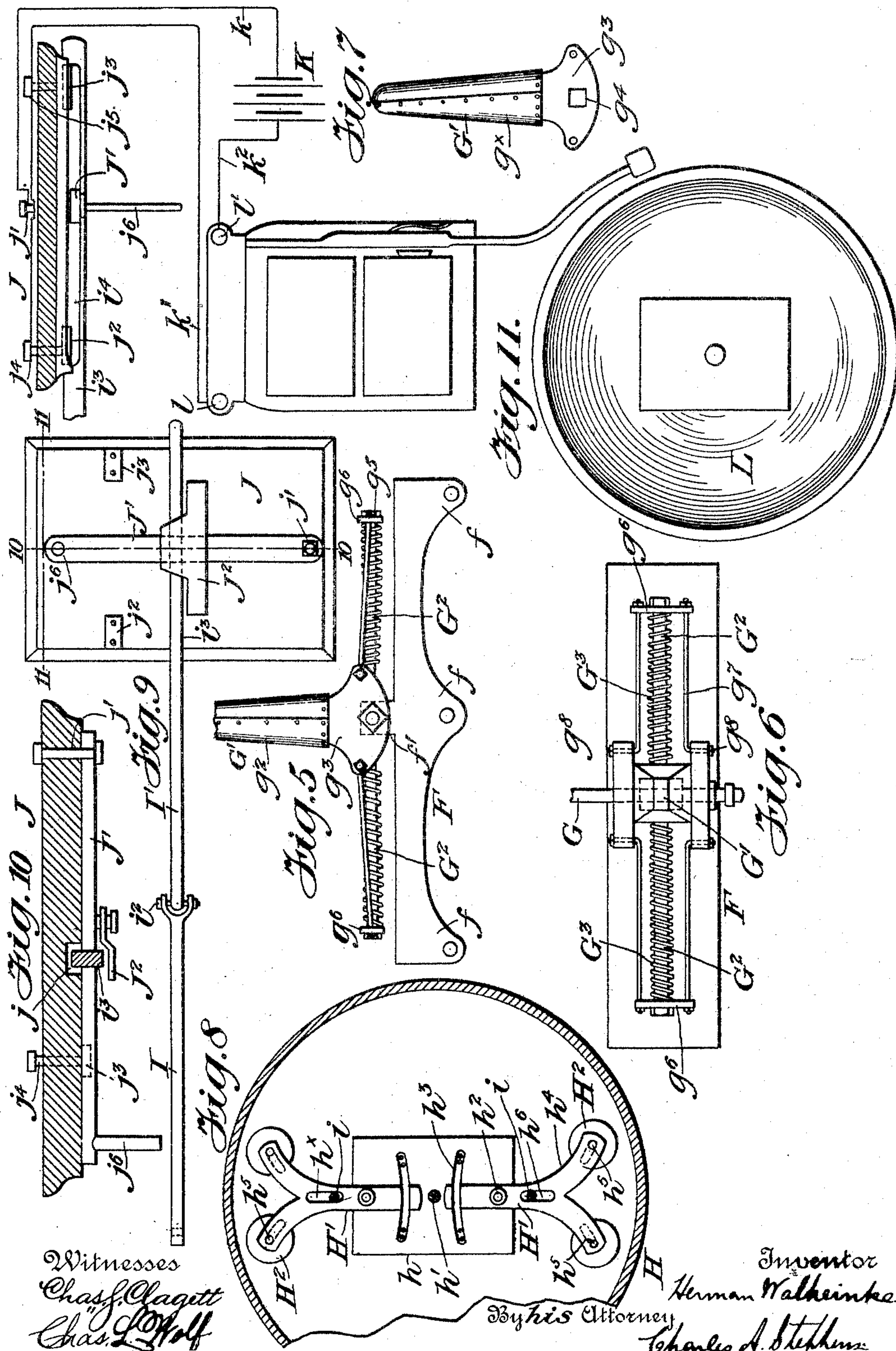
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UNITED STATES PATENT OFFICE.

HERMAN WALHEINKE, OF WEST HOBOKEN, NEW JERSEY.

RAILROAD SIGNAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 776,629, dated December 6, 1904.

Application filed March 24, 1904. Serial No. 199,711. (No model.)

To all whom it may concern:

Be it known that I, HERMAN WALHEINKE, a citizen of the United States, and a resident of West Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Railroad Signal Apparatus, of which the following is a specification.

The present invention relates to improvements in railroad signaling apparatus, the more prominent objects being to provide highly-efficient, as well as comparatively simple, means whereby when requisite either a cautionary or danger signal will be positively and distinctively sounded on a moving locomotive or train in such manner as to insure a proper realization of conditions on the track or way which caution and danger signals generally represent.

An important feature connected with the invention is the adaptability of the improvements for installation without involving any considerable expenditure of labor and expense in comparison with the advantages to be secured and element of increased safety conferred. Moreover, the novel means can be employed in conjunction with or supplementary to any of the different systems of railroad-signals now in use.

With the above and other purposes in view the novel signaling apparatus comprises generally a movable tappet-lever arranged along the track or way and capable of assuming and being retained in either of three positions corresponding with "clear," "caution," or "danger," the last two positions being such that said lever will contact with an arm or other suitable device on a passing locomotive or car, and thereby actuate an audible signal on such locomotive or car, the signal for either condition being of such distinctive character as to insure notice and understanding of the same.

A development of the invention consists in so disposing each tappet-lever that the latter will be operated by the connections and appliances embodied in a signaling system of any of the approved types, with the result that the tappet-lever will be moved to and retained in positions corresponding with the

required signal conditions and with the similar adjustments of the signal devices specifically provided in the particular system selected. Thus the tappet-lever and its retaining means can be controlled by the semaphore-operating wires employed in a block system or by rod connections characteristic of the electric-gas system in vogue.

The improved means are susceptible of operation whether the locomotive or car is moving forward or backward and without regard to which side of the track or way the tappet-lever is located.

There are other important features connected with the invention which, besides those previously alluded to, are clearly set forth in the subsequent detailed description.

In the accompanying drawings, forming part of this specification, Figure 1 is a part elevational and part sectional view of a portion of semaphore standard or post and upper portion of a locomotive-cab equipped with one form of my invention, certain features within the cab being for the purposes of illustration of somewhat exaggerated proportion. Fig. 2 is an elevational view of the semaphore-carrying portion of the standard omitted from Fig. 1. Fig. 3 is a detail elevational view of that part of the standard on which the tappet-lever and its retaining means are located, the view being at right angles to that in which the standard appears in Fig. 1. Fig. 4 is an enlarged vertical detail sectional view of certain features within the cab. Fig. 5 is a side view of one of the contact-arms and its base located on the locomotive, part of the arm being broken away. Fig. 6 is a plan view of the contact-arm and its base as illustrated in the preceding figure. Fig. 7 is a view of a contact-arm detached. Fig. 8 is an inverted sectional plan view of the gong and certain of the sounding devices represented in Fig. 1, the section being in the plane indicated by the broken line 88 of said latter figure. Fig. 9 is a bottom view of the circuit-closing switch and immediate operative connections, pertaining more particularly to the means for transmitting the "danger-signal." Fig. 10 is a longitudinal sectional view of the circuit-closing switch, the section being in

the plane of the broken line 10 10, Fig. 9. Fig. 11 is a transverse sectional view of said switch, the section being in the plane of the broken line 11 11, Fig. 9. This view also illustrates the electrically-actuated gong devices associated with the switch.

Similar reference characters are employed to designate corresponding parts in the several figures where they occur.

As disclosed in Fig. 1, the tappet-lever A is pivotally mounted in a bracket a , appropriately secured to the semaphore standard or post B, the pivotal support of the tappet-lever being such as to adapt its forward portion a' to assume either of the three positions 1, 2, and 3 indicated by full and dotted lines. It will be convenient to have the lever A of the angular form illustrated and pivot this lever in its bracket at the lower angle of the elbow a^2 . The portion a^3 at the rear of the elbow is in a slightly-higher plane than that occupied by the portion a' . A diagonal strap a^4 , bolted to the side of the standard B, contacts with said standard side to confine and brace the rear portion a^3 of the lever in its pivotal movements and more particularly with a view of resisting the lateral strain to which the lever is subjected in striking the herein-after-described contact-arm on passing locomotives or cars. It may be well to here state that the contact-arm and parts actuated thereby can be either on a locomotive or a car, and with this understood these particular features for the sake of brevity will be hereinafter described as being on the locomotive, which arrangement, for obvious reasons, will be the more preferable.

Returning to the lever A and other parts on the standard B, on the rear of the latter is pivotally secured at the elbow c thereof an angular detent C, the vertical member c' of which depends contiguous to the front of the standard and has two offsets c^2 c^3 , the upper horizontal edges of which are designed to serve as stops upon which the forward part of the lever A is to bear and retain said part against downward movement. A diagonal strap-keeper c^4 on the side of the standard B confines the depending member C' of the detent and insures the proper operative maintenance of said member in its relation with respect to the forward part of the lever. The other member, c^5 , of the detent extends substantially horizontal to and beyond one side of the standard, said member embodying two lateral bends forming portions c^6 c^7 , as indicated more clearly in Fig. 3. A rod d connects the lever A at a point to the rear of its pivot to the forward portion of a bar D, pivotally mounted above on the standard side, the rear part of said bar being weighted to counterbalance through a suitable connection e the semaphore E, also pivotally mounted on the standard near the top thereof. A stop d' on the pivot-plate of the arm D serves to prevent the weighted part

of the latter from moving below a horizontal position. The semaphore is capacitated for both day and night service in a manner familiar with this class of devices, the disks e' e^2 being provided to coact with a suitable light to indicate at night the green or caution and the red or danger signals, respectively. The parts are shown as set for the danger-signal. A rod d^2 connects the rear member c^5 of the detent C with the counterbalance-bar D at the rear of its pivot. This rod d^2 may also be utilized in adapting the improvements for combination with the electro-gas system when the invention is used in connection therewith.

D' D^2 are the wires used for setting the signal, as in the ordinary block-signal system. The wire D' passes direct to and is shown as being connected to the forward end of the bar D. The wire D^2 is attached to the rear part of the detent C and designed to control the movements of the latter.

At each side of the cab of the locomotive and at any suitable point thereon is secured a metal section F, which, as disclosed in Figs. 1, 5, and 6, is rectangular and somewhat extended in plan and of peculiar cross-section, the latter feature being shown in Fig. 1, the cross-sectional shape permitting the said section to be adjusted and bolted so as to be rigidly secured to conform to the angle externally presented at the top of the cab at the intersection of the side and roof thereof. For this purpose the section F has outer depending ears F, perforated for the passage of the securing-bolts. Integral with this base at an intermediate point thereon is a short vertical lug f' , having a transverse opening for the reception and bearing of a horizontal shaft G, which projects considerably beyond this lug at its outer side, said shaft extending through an appropriate opening in the cab-roof and having its inner end revolvably supported in a thrust-bearing g on the side of a block g' , centrally secured in the upper part of the cab-compartment. An intermediately-located hanger g^2 contributes to support this shaft. A contact-arm G' has its enlarged butt bifurcated to enable it to straddle the lug f' of its particular base F, such bifurcation resulting in parallel longitudinally-extended segments g^3 , one at each side of the lug and each containing a square or other shaped opening g^4 for receiving a correspondingly-shaped part of the shaft G and insure the latter partaking of motion acquired by its arm.

Screwed into a threaded recess therefor in the front and back of the lug f' of the base are the inner ends of forward and rear longitudinal guides G^2 , the outer end of each of which has a nut g^5 to limit the outward movement of a slide-plate g^6 , to the side extremities of which are connected parallel rods g^7 , for which purpose the outer ends of these rods pass through perforations in these extremities and are engaged by nuts. The perfora-

tions mentioned are capable of permitting a limited vertical and lateral slue of the rods, whereby they can be manipulated so that their inner bent ends can be engaged and pivotally held within perforations therefor in the adjacent end of the arm-segment g^3 at that side. Coiled expanding springs G^3 on the guides G^2 abut against the lug f' and the slide-plate g^5 and yieldingly maintain the arm G' normally in a vertical position.

To the under side of the block g' is attached a facing-plate h , the connection being shown as effected by means of an elongated bolt h' , a portion of which depends for suspending a gong H .

On opposite sides of the bolt h' are diametrically-disposed shanks $H' H'$, each of which is pivotally supported immediately beneath the plate by a pivot-bolt h^2 , bearing in the latter. As the succeeding features pertaining to each shank are substantially the same as those of the other, a description of the features pertaining to one of said shanks will suffice for understanding of both.

The inner end of each shank is confined and restricted in its lateral movements by an inwardly-curved keeper h^3 , bolted to the plate h . At its outer end the shank presents relatively diverging curved necks h^4 , near the outer end of each of which is a vertical bolt h^5 projecting upwardly through the slot h^6 of a circular head or hammer H^2 , the engagement of these parts being maintained by a nut on the upper end of the bolt h^5 above the head. It will be comprehended that as the shank is swung on its pivot h^2 in either direction one or the other of the necks h^4 is brought nearer the gong, according to the direction of movements and the hammer of such neck by reason of its slot and bolt engagement, and by the momentum thus acquired be projected to contact with the gong and produce a loud tone.

Depending through a longitudinal slot h in the forward part of the shank is a rod i , the upper end of which is suitably connected to the shaft G above—as, for instance, by being screw-engaged within a recess tapped in the under side of said shaft. Connected to the upper side of the latter, if desirable, in a similar manner is a short vertical standard i' , in the upper forked extremity of which is pivoted the end of a horizontally-extended rod I . The other end of this rod is vertically bifurcated for the pivotal attachment of one end of a similarly-extended rod I' , the pivot i^2 admitting of the vertically-swinging movement of the rod I relative thereto to compensate for the change of position of that end which is connected to the standard i' , due to the oscillation of the latter by reason of the partial turning of its shaft G .

The end portion i^3 of the rod I' farthest from the pivot i^2 is adapted to be slidingly guided in a groove j transversely in the under face

of the base of a switch J , the latter being suitably fastened to the ceiling or upper part of the cab-compartment. Said end portion i^3 of the rod I' contains an elongated slot i^4 , equal, or nearly so, in length to the width of the switch-base, and through this slot extends the switch-circuit-closing bar J' , one end of which is on a pivot j' , so that the bar can be oppositely swung against either of two contacts $j^2 j^3$. A handle j^6 , depending from the free end of the bar J' , permits the latter to be moved from a contact to a non-contact position. A keeper J^2 on the switch-base retains the rod portion i^3 in its guided relation within the groove j . The pivot j' and also bolts $j^4 j^5$, which latter are connected with the contacts $j^2 j^3$, extend to the back of the switch to serve as binding-posts for the attachment of the wires necessary to complete an electric circuit with the electromagnetic actuating provision of an electric bell. As shown, one element of the battery K is connected by a wire k with the pivot j' . The binding-posts $j^4 j^5$ are connected by a common wire k' with one of the posts l of the magnet provision of the bell L . The other binding-post l' is connected by wire k^2 with the battery.

From the description thus far it will be easy to understand that with the tappet-lever A in the safety or clear position indicated by the dotted lines 3, Fig. 1, a locomotive equipped with the contact arm or arms G and devices actuated by the latter can pass in either direction along the track or way and no audible signal will be given. When, however, the tappet-lever is adjusted to, say, the green or safety position indicated by the dotted lines 2 in said Fig. 1, it will be so retained by reason of the detent having been swung on its pivot so that its upper offset e^2 will engage beneath and hold the forward portion a' of the lever in the position desired. As thus conditioned the outer part of this lever is at such altitude that the locomotive passing in either direction will be certain to receive the desired signal by reason of the fact that the tappet-lever will strike the nearest contact-arm G' at such height as to only partially turn it and its shaft G , but sufficient, however, by reason of the engagement of the rod i with the shank H' , pertaining thereto, to laterally swing said shank and cause its appropriate hammer or head to strike the gong H and give the cautionary signal. The slot h^6 in the shank provides for the changing position of the latter with respect to the rod i engaged therewith. As soon as the partially-depressed contact-arm clears the tappet-lever the springs G^2 at the base of said arm operate to restore it to its normal vertical position ready to be struck by another tappet-lever at a succeeding point along the track or way. The partial turning movement imparted to the shaft G of the arm struck will, through the standard and rod connections, reciprocate the rod portion i^3 to a

limited extent across the switchboard, but by reason of the presence of the slot i^4 not to an extent sufficient to cause either of the parts forming the ends of the slot to engage and move the switch-bar J' against either of the contacts $j^2 j^3$; but should the tappet-lever be set and latched in the red or danger position I (represented in full lines, Fig. 1) the nearest arm G of a passing locomotive would be struck at a point more adjacent to its pivot, whereby such arm would undergo a greater degree of depression and one calculated to not only cause the gong H to be sounded, but throw the proper standard i' to such extent as to reciprocate the rod portion i^3 , so as to move the switch-bar against one or the other of the contacts $j^2 j^3$ (according to the direction in which the locomotive is traveling) and close a circuit through the magnet provision of the bell, thereby giving a prolonged danger-alarm and of a character thoroughly distinctive from that of the audible cautionary signal previously described.

By reason of the extended slot i^4 in the rod portion i^3 the latter can, through the indirect reactive effect of the springs $G^2 G^2$ of the arm depressed, assume its normal position without disturbing the bar J' in its circuit-closing relation. Hence the danger-signal will continue to sound until the circuit is broken by the attendant grasping the handle j^6 and moving the bar to an intermediate position.

Ordinarily the engineer will upon receiving the brief but distinct cautionary signal slow down, in which event he will be proceeding safely upon notice until the next tappet-lever is reached, the condition of which will apprise him of what is necessary under the circumstances; but if for any reason the cautionary signal is ignored the succeeding danger-signal will for reasons stated be such as to insure proper attention on the part of those on the locomotive. Manifestly inattention of the engineer to the cautionary signal and subsequent non-observance of the succeeding prolonged danger-signal will immediately apprise the fireman to discharge the responsibilities vitally associated with his duties.

The improved signaling apparatus obviates all dangers and uncertainties attendant upon determining the signals either at night or in foggy or other obscure conditions. Moreover, the audible signals will be given whether the locomotive is moving forward or backward, and by providing a duplicate of the circuit-closing switch J, operating-rods, and circuit-wires for the shaft G at the opposite side of the locomotive signals will be transmitted from the corresponding side of the track or way.

In employing the invention in connection with a locomotive of the "Hog" type, where the fireman is isolated from the engineer by being located in a separate compartment formed by a hood at the rear of the tender, a

gong operated by the danger-signal devices can be placed in such separate compartment. Consequently when the prolonged danger-signal is given to the fireman and no evidence is manifested on the part of the engineer that proper notice is taken of such signal the fireman immediately recognizes the inattention or dereliction on the part of the engineer and is impelled to ascertain the cause.

On sections of road having three, four, or a greater number of tracks a truss can span the entire series and the tappet-levers be properly supported by hangers depending from such truss.

The strength of the springs G^2 of the contact-arms can be such that besides normally maintaining the arm in a vertical position they will operate to cushion the parts on the locomotive against any tendency to injury through violent contact of the arms with the tappet-levers. This advantage can be further promoted and defacement of both the arms and levers avoided by providing each of the former above its segments with a protective covering g^x of any suitable material, as rubber, fiber, or leather. The latter properly treated with oil will give highly satisfactory results through its capacity to withstand shocks and blows and resist the deteriorating effect of climatic and atmospheric conditions.

As the danger-signals are of comparative infrequency, the extreme depression of the contact-arms and corresponding actuation of the devices on the cab will not occur sufficiently often to cause premature impairment of the parts.

Palpably any error on the part of both the engineer and fireman in determining the character of the usual signals along the track or way will be audibly rectified by my improvements.

The length and altitude of each tappet-lever will be such that the lever will in no way interfere with any part of the locomotive or train other than the proper contact-arm thereon. Moreover, the height of the contact-arm can be so proportioned as to allow for the lowest overhead objects along the line, and in any case the highest type of locomotive can be adapted as the standard, in which latter event the contact-arms on the lower locomotives will be elevated to occupy a similar plane.

As the momentary depression of a contact-arm by a tappet-lever is all that is required, the improved signaling apparatus will work as positively with the locomotive traveling at a high rate of speed as when moving slow.

Instead of using a separate gong for the red or danger signal, as previously set forth, the electrically-actuated striker or hammer may be in juxtaposition with the gong H, which can serve for both the caution and danger signals.

I do not desire to be understood as limiting myself to the precise construction and arrangement of parts shown and described, but

reserve the right to all modifications within the scope of my invention.

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

1. In railroad signaling apparatus, the combination with a tappet-lever along the track or way and adapted to assume either of three positions corresponding with clear caution and danger conditions respectively, of a contact-arm and signal devices on a locomotive or car, said contact-arm designed to be operated by said lever when in either the caution or danger positions to transmit a distinctive actuation to the said signal devices.

2. In railroad signaling apparatus, the combination with a tappet-lever along the track or way and adapted to assume either of three positions corresponding with clear, caution and danger conditions respectively, of a contact-arm and audible signal devices on a locomotive or car, said contact-arm designed to be operated by said tappet-lever when in either of the caution or danger positions to transmit a distinctive actuation to the said signal devices.

3. In railroad signaling apparatus, the combination with a tappet-lever along the track or way and adapted to be adjusted in either of three positions corresponding with clear, caution and danger conditions respectively, of a means for latching said lever in either of its caution or danger positions, a contact-arm and signal devices on a locomotive or car, said contact-arm designed to be operated by said lever when in either of the latched positions to transmit a distinctive actuation to said signal devices.

4. In railroad signaling apparatus, the combination with a tappet-lever along the track or way and adapted to be adjusted in either of three positions corresponding with clear, caution and danger conditions respectively, of a contact-arm and audible signal devices on a locomotive or car, said contact-arm designed to be operated by said tappet-lever when in either of the caution or danger positions to actuate the signal devices, the actuation of the arm and signal devices by the lever when in the caution position differing in degree from the actuation when in the danger position.

5. In railroad signaling apparatus, the combination with a tappet-lever along the track or way and adapted to be adjusted in either of the three positions corresponding with clear, caution and danger conditions respectively, of means for latching said lever in either of its caution or danger positions, connections for simultaneously moving the lever and latch a contact-arm and signal devices on a locomotive or car, said contact-arm designed to be operated by said lever when latched in either of the caution or danger positions to transmit a distinctive actuation to said signal devices.

6. In railroad signaling apparatus, the com-

bination with a tappet-lever along the track or way and adapted to assume either of the three positions corresponding with clear, caution and danger conditions respectively, of a contact-arm and signal devices on a locomotive or car, said contact-arm designed to be operated by said lever when in the caution or danger positions to transmit a distinctive actuation to the said signal devices, and spring provision for maintaining said contact-arm in a normal position.

7. In railroad signaling apparatus, the combination with a tappet-lever along the track or way and adapted to assume either of the three positions corresponding with clear, caution and danger conditions respectively, of a contact-arm and signal devices on a locomotive or car, said contact-arm capable of moving in opposite directions and designed to be operated by said lever when in the caution or danger positions, to transmit a distinctive actuation to the said signal devices, and spring provision for maintaining said contact-arm in a normal position.

8. In railroad signaling apparatus, the combination with a tappet-lever along the track or way and adapted to assume either of three positions corresponding with clear, caution and danger conditions respectively, of a contact-arm and signal devices on a locomotive or car, said contact-arm designed to be operated by said lever when in either of the caution or danger positions to transmit a distinctive actuation to said signal devices, and a protective covering for said arm.

9. In railroad signaling apparatus, the combination with a semaphore and a tappet-lever along the track or way and both adapted to assume either of three positions corresponding with clear, caution and danger conditions respectively, of connections for coincidentally bringing the semaphore and lever to corresponding conditions, and a contact-arm and signal devices on a locomotive or car, said contact-arm designed to be operated by said lever when in either of the caution or danger positions to transmit a distinctive actuation to said signal devices.

10. In railroad signaling apparatus, the combination with a tappet-lever along the track or way and adapted to assume either of three positions corresponding with clear, caution and danger conditions respectively, of a contact-arm and caution and danger signaling devices on the locomotive or car, said contact-arm capable of movement to a greater and a less extent, and connections between the arm and signaling devices whereby the actuation of either said signaling devices will be governed by the character of the contact of the lever with said arm.

11. In railroad signaling apparatus, the combination with a tappet-lever along the track or way and adapted to assume either of three positions corresponding with clear, caution and

danger conditions respectively, of a contact-arm, mechanically-operated caution-signal and electrically-operated danger-signal, devices on the locomotive or car, and connections between the arm and said devices whereby the respective actuation of said devices will be governed by the caution or danger position of the tappet-lever when contacting with the arm.

12. In railroad signaling apparatus, the combination with a movable tappet-lever along the track or way, of a contact-arm and gong carried by the locomotive or car, a pivoted shank and sliding head for said gong, and connections between the arm and shank whereby when the arm is operated by the lever, the shank will be swung and the hammer thrown in contact with the gong.

13. In a railroad signaling apparatus, the combination with a movable tappet-lever along the track or way, of a contact-arm and gong carried by the locomotive or car, said arm being movable in opposite directions, a pivoted shank in juxtaposition to the gong and having diverging necks, a sliding head on each neck, and connections between the arm and shank, whereby when the arm is moved in one direction or the other the shank will swing in one of two directions to throw one of its hammers in contact with the gong.

14. In railroad signaling apparatus, the combination with a movable tappet-lever along the track or way, of a contact-arm and gong carried by the locomotive or car, a hammer for said gong, a circuit-closing switch and electrically-actuated gong-hammer controlled thereby, a shaft operable by said arm and co-active with the first-mentioned hammer, to move the latter by a partial turning of the shaft, and connections between the latter and the switch for closing said switch when the shaft is turned to a further extent.

15. In railroad signaling apparatus, the combination with a movable tappet-lever along the track or way, of a contact arm and shaft operable thereby and both carried by the locomotive or car, a circuit-closing switch embodying a movable switch-arm, a rod connected with said shaft and having an extended slot through which said switch-arm extends, a gong controlled by said switch, said contact-arm capable of moving in opposite directions whereby either of said movements induced by the tappet-lever will effect the movement of the switch-arm in either direction to close a circuit and sound the gong.

16. In a railroad signaling apparatus, the combination with a movable tappet-lever along the track or way, of a contact-arm shaft operable thereby, a gong and its hammer carried by the locomotive or car, means for operating the gong-hammer from the shaft, a circuit-closing switch embodying a movable switch-arm, a rod connected with the shaft and having an extended slot through which said switch-arm extends, a gong-hammer controlled by said switch, said contact-arm being capable of moving in opposite directions to effect a greater or less turning of the shaft according to the position of the tappet-lever, the less turning effecting the throwing of the gong-hammer first mentioned, while the greater turning of the shaft induces both the throwing of the first-mentioned hammer and the movement of the switch-arm in either of two directions.

Signed at West Hoboken, in the county of Hudson and State of New Jersey, this 14th day of March, A. D. 1904.

HERMAN WALHEINKE.

Witnesses:

CHAS. MCCARTHY,
PETER MANCHELKOW.