

No. 777,060.

PATENTED DEC. 13, 1904.

R. AVERY, DEC'D.

G. C. AVERY, EXECUTRIX.

RAILWAY SIGNALING DEVICE.

APPLICATION FILED NOV. 11, 1901. RENEWED APR. 4, 1904.

NO MODEL.

2 SHEETS—SHEET 1.

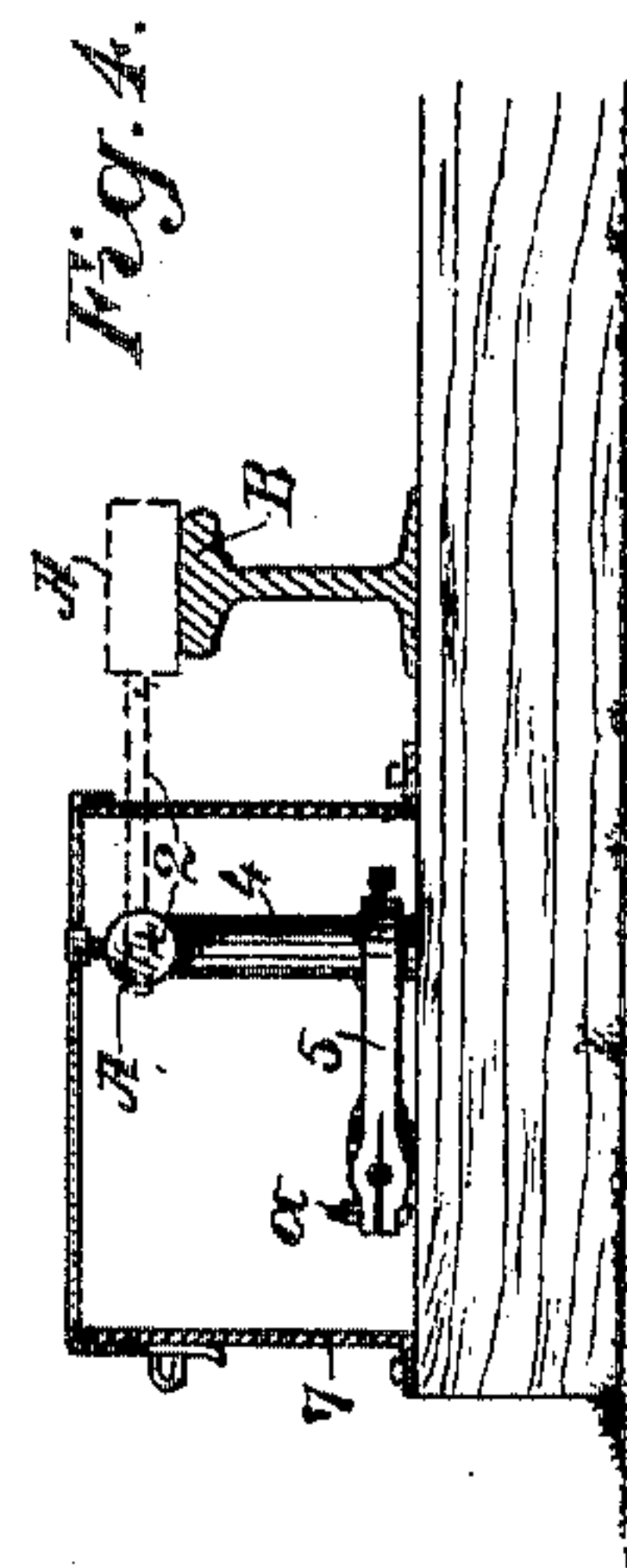
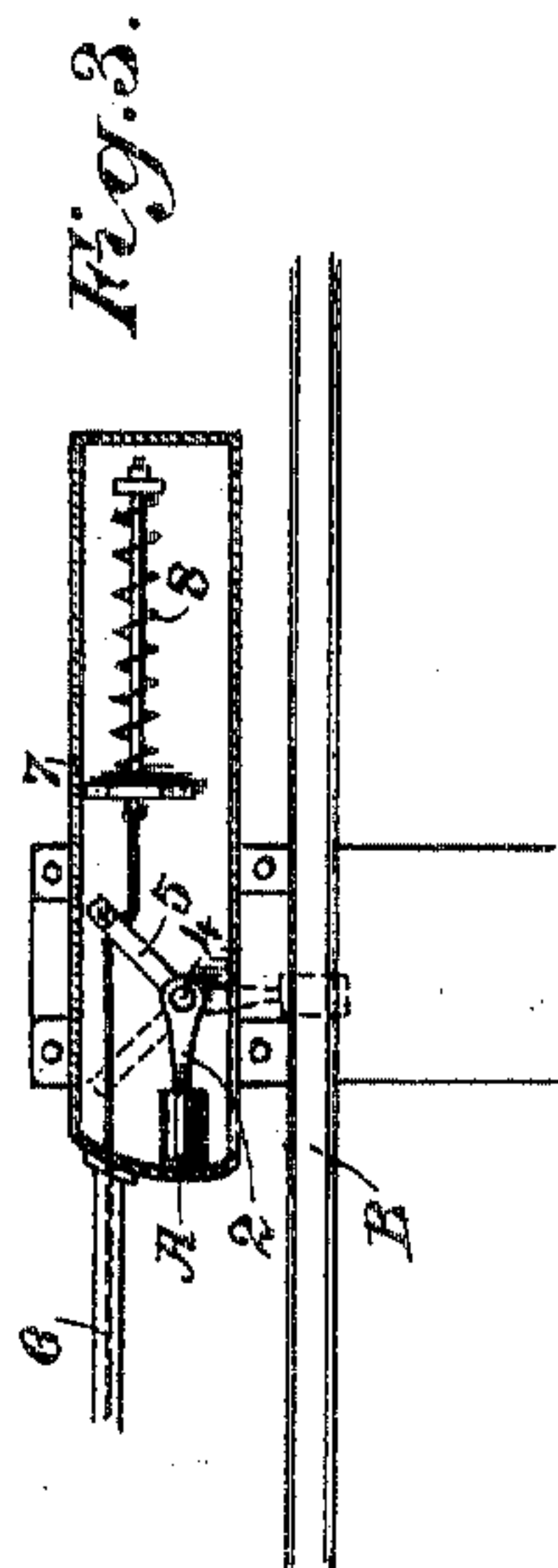
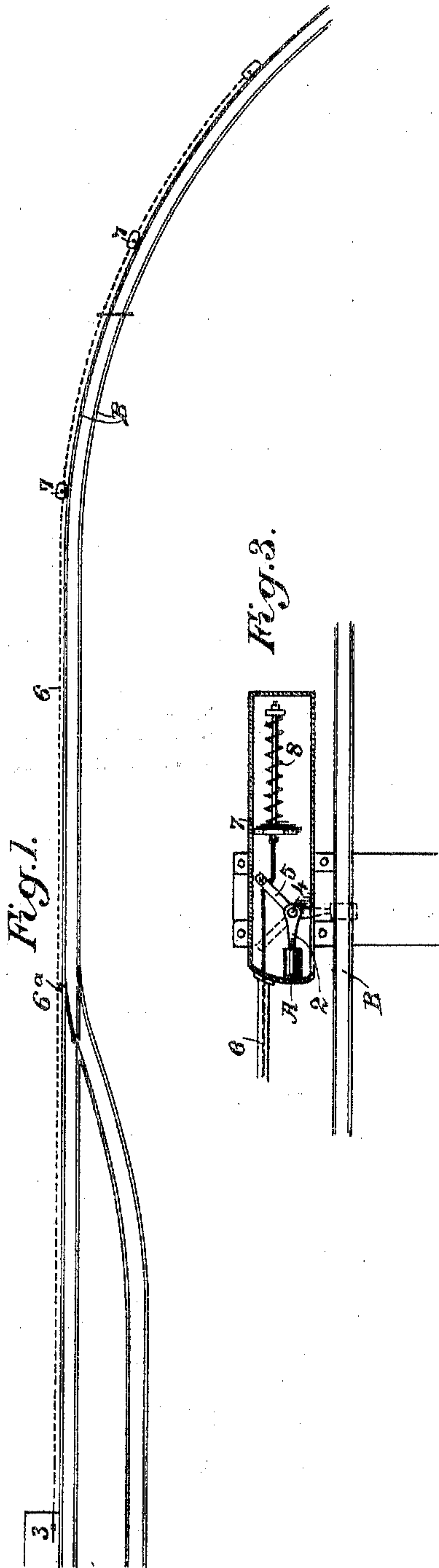
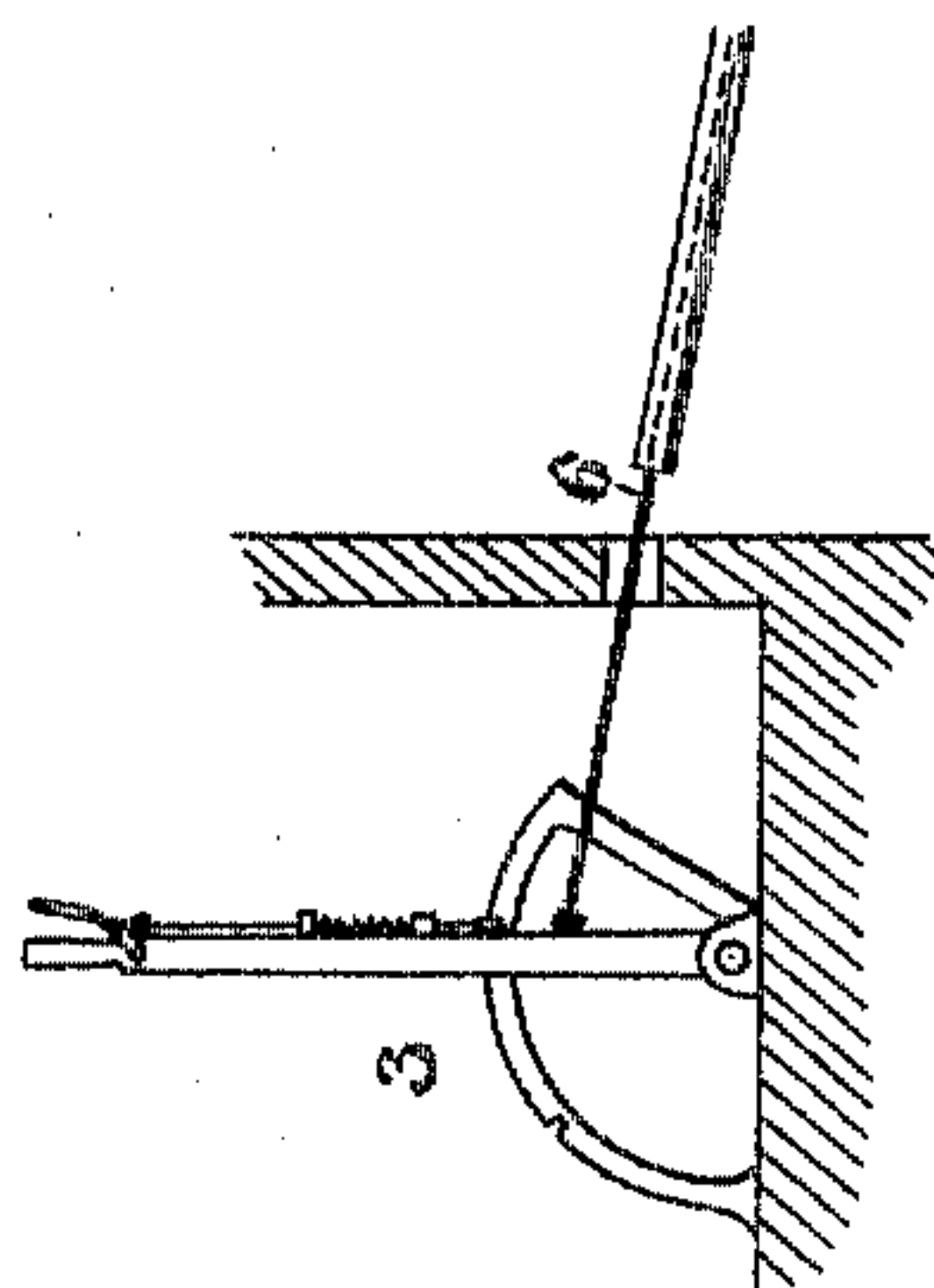


Fig. 2.



Witnesses,
Attest
J. F. Oscheck

Inventor,
Russell Avery
Devery Strong & Co. atty

No. 777,060.

PATENTED DEC. 13, 1904.

R. AVERY, DEC'D.

G. C. AVERY, EXECUTRIX.

RAILWAY SIGNALING DEVICE.

APPLICATION FILED NOV. 11, 1901. RENEWED APR. 4, 1904.

NO MODEL.

Fig. 5.

2 SHEETS—SHEET 2.

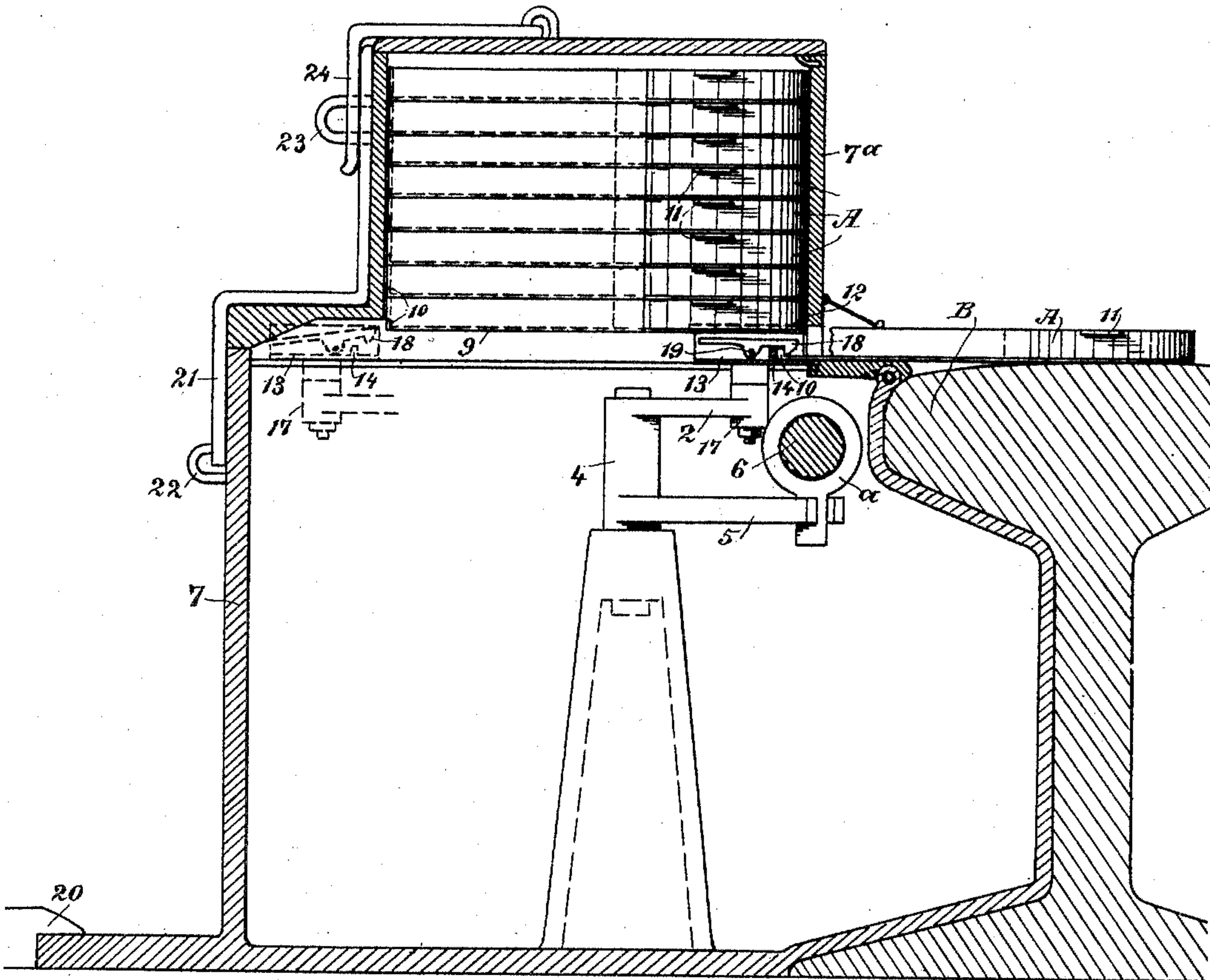
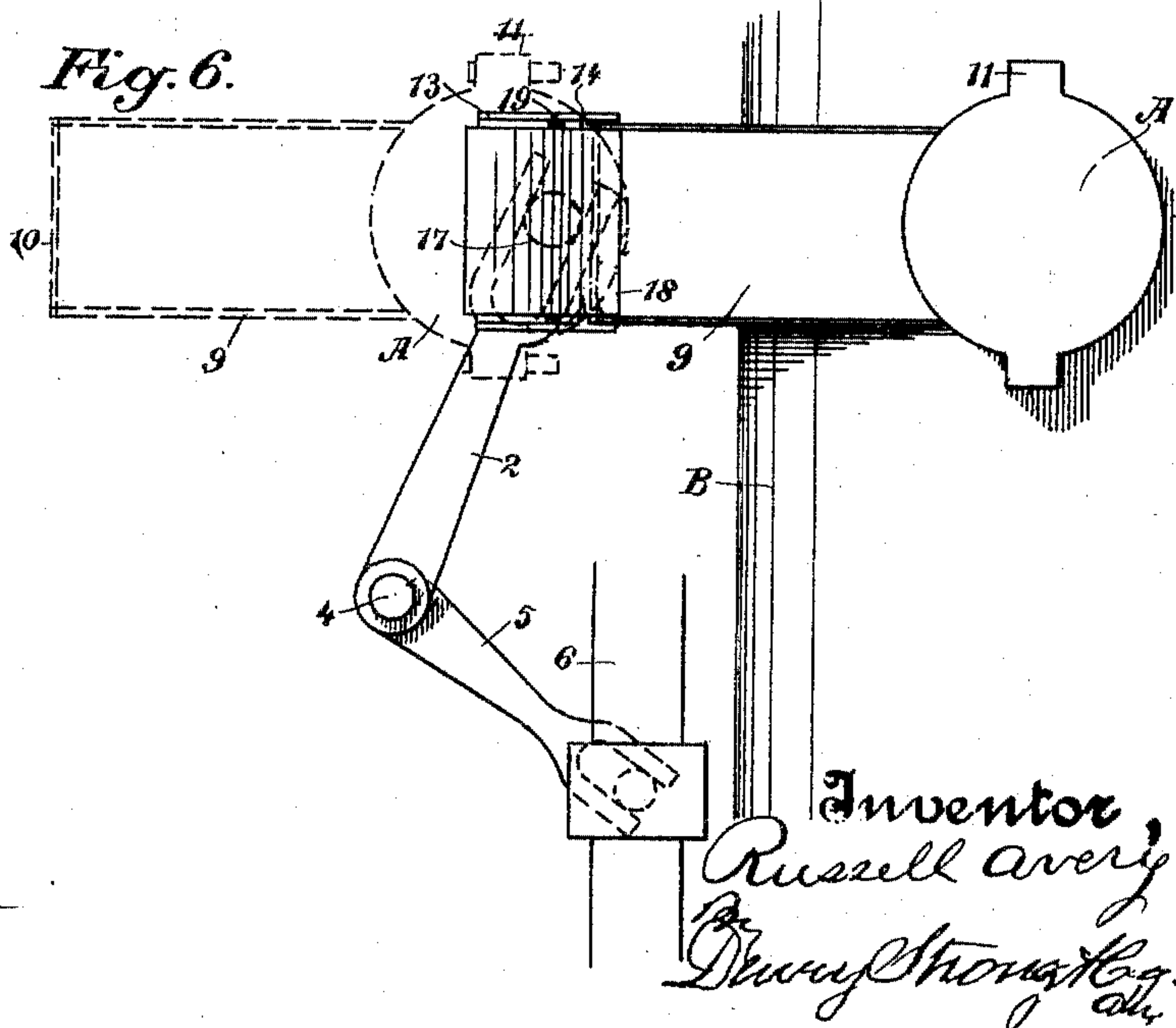


Fig. 6.



Witnesses,

J. F. Aschbeck

Inventor,

Russell Avery
Dwight Strong

UNITED STATES PATENT OFFICE.

RUSSELL AVERY, OF SAUSALITO, CALIFORNIA; GIACINTA CARSONI
AVERY EXECUTRIX OF SAID RUSSELL AVERY, DECEASED.

RAILWAY SIGNALING DEVICE.

SPECIFICATION forming part of Letters Patent No. 777,060, dated December 13, 1904.

Application filed November 11, 1901. Renewed April 4, 1904. Serial No. 201,597. (No model.)

To all whom it may concern:

Be it known that I, RUSSELL AVERY, a citizen of the United States, residing at Sausalito, county of Marin, State of California, have invented an Improvement in Railway Signaling Devices; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus which is especially designed for signaling the presence of trains upon the line of track over which other trains are liable to approach and to give warning to the approaching train of such other train in time to prevent collisions.

It consists of a series of torpedoes or equivalent devices and means by which they are temporarily placed above the rails in line of the approaching train, so that the officials of such train will be given an audible warning of the presence of another train upon the track in front.

It also consists in details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a plan view of my signals. Fig. 2 shows the point of operation. Fig. 3 is a plan view of one of the casings and its contents. Fig. 4 is a vertical section of the same. Fig. 5 is an enlarged transverse section of the magazine and attachments. Fig. 6 is a plan showing torpedo and actuating-lever.

Frequent rear-end collisions occur upon railways by reason of the unexpected stoppage or detention of a train upon the track at a station or other point, and where warning is not given the following train, believing the road to be clear, comes up without checking its speed, and disastrous collisions frequently occur.

It is the object of my invention to prevent such collisions by warning the approaching train by a series of audible signals so placed that ample time will be given to stop the train before it reaches the danger-point. These signals consist of torpedoes or equivalent explosive devices such as are used in connection with railway practice, and these torpedoes A may be mounted upon movable arms and connected by any suitable means with operating

levers or mechanism 3, located at the point where the previous train may be standing. A single torpedo may be actuated in this manner and be replaced by another when expended. I prefer to have a number of torpedoes in a magazine with mechanism by which they may be placed upon the track by connection with a distant operating-station and replaced as needed until exhausted.

Figs. 3 and 4 show the torpedo or explosive A carried upon an arm 2, which is mounted upon a vertically-turnable post 4. This post has a lever-arm 5, to which is connected a wire or rod 6, and this wire or rod extends through suitable guides or protecting-tubes to a point sufficiently distant from the torpedo where it connects with the lever 3. In practice it is found that such collisions and accidents take place at stations, and the lever 3 would properly be arranged in close proximity with the station, the wires or connections following the line of track to a distance of a quarter or half mile or more from the station.

The torpedoes or explosives A and the vertical posts upon which the arms carrying the torpedoes are turnable are preferably contained within casings, as shown at 7, and in their normal condition the arms will be turned so that the torpedoes are concealed within the casings by the side of the track and at about the level with the top of the track. In practice it is possible to have a series of these torpedoes arranged at short distances apart, so that an oncoming train will strike the torpedoes when in place and discharge them successively, so that there will be no question about sufficient warning having been given to the train officials.

It will be the duty of all the officials of the train which has been stopped at the station to see that the lever 3 or its equivalent has been moved so as to swing the torpedoes out across the track at the instant when the train stops, so that another train following will discharge these torpedoes and give its officials the proper warning, so that the train may be stopped before reaching the station or colliding with the train in front. As soon as the train which has been lying at the station moves out the

lever 3 is moved to swing the torpedoes off the track and into their casings, thus leaving the track free for the next train, which will then pass without warning.

5 The operation of removing the torpedoes from the track may either be effected by the direct movement of the lever or it may be effected by means of a sufficiently powerful spring 8, either connected with the line of wire
10 at a point beyond the last of the torpedoes or in other suitable manner, so that when the lever is moved the spring will act to pull the connecting-wire in the opposite direction and swing the torpedoes off the track.

15 In order to maintain the proper tension between the different levers 5, through which the rod or wire acts, I have shown the levers split at the outer ends, so as to form a clamp through which the wire passes, and this split
20 end has a clamping-screw *a* passing through it. When the clamping-screw is turned so as to grip the wires, they will all be held firmly to the levers. If any slack takes place, it is easily taken up by loosening the clamping-screws
25 and pulling the wire or connection through until the slack has been taken up.

In order to maintain the apparatus in readiness for use without visiting it after the expenditure of a torpedo, I prefer to make a casing 7 large enough to form a magazine in
30 which a number of torpedoes may be contained superposed one upon the other, as shown in Fig. 5. Each of the torpedoes has a projecting arm 9 with the end upturned, as shown
35 at 10, and upon each side are projecting lugs 11. Within the casing parallel with the bottom and raised sufficiently above are the guide-rails 12, and as the lugs 11 project from the top of the torpedo they rest upon these guide-rails.
40 The bottom of the casing is open beneath the line of torpedoes; but while the torpedoes are intact they cannot pass through, because of the lugs 11 resting upon the guides 12. The box 13 is a slide consisting of side bars movable
45 on each side of and parallel with the extension 9 of the torpedo, and these side bars have inwardly-projecting lugs 14, which when the slides are pushed forward strike the upturned rear end 10 of the torpedo extension, thus
50 pushing it forward and out through a slot or opening in the front of the case 7, through which it is movable, directly upon the top of the railway-rail B and in position to be exploded and crushed by a passing train. The
55 slide 14 may be connected in any suitable way with the operating cord and lever. In the present case I have shown a bell-crank lever 5, having its angle pivoted upon the top of the post 4 and one arm connected with the
60 operating rope or rod 6. The other arm, 2, is connected with a stud or pin 17, which is connected so as to move the sliding carrier 13, so that a pull upon the cord or rod 6 or equivalent actuating device will move the parts and
65 project the torpedo, as previously described.

After a torpedo has been exploded and crushed it is necessary to remove it, so as to be in readiness to place another one upon the track when required without visiting the magazine 7, which may be at a considerable
70 distance from the point where the operating-lever 3 is stationed. In order to do this, I have shown a hook-arm 18 pivoted to the carriers 13, as shown at 19. The front end of this arm carries the hook, and the arm
75 itself is sufficiently elastic so that when the carriers are first pushed forward this hook will pass over the upturned end 10 of the extension 9 of the torpedo, and this can be effected because the frictional resistance to the
80 movements or movement of the torpedo is made sufficient to allow of this action before the lugs 14 strike the plate 10. Then when the hook 18 has passed over the upturned edge 10 the lugs 14, contacting with it from
85 behind, will push the torpedo out upon the track, as previously described, the surface of the box exterior to the case 7 being approximately on the plane of the top of the track.

When the torpedo is crushed by the passing
90 train, it will be flattened down, and the projecting lugs or arms 11 upon each side will then be below the level of the guides 12, which are within the casing. The hook 18 will still be in engagement with the upturned
95 rear end 10 of the plate 9, so that when the movement of the parts is reversed the hook will drag the torpedo backwardly into the casing and beneath the guides 12, so that when it arrives above the open bottom of the
100 casing it will drop.

In order to cover and protect all the parts which have been heretofore described, I have shown the casing as made in two parts, the magazine 7^a, containing the torpedoes, fixed
105 to or forming a part of the cover of the main box or casing 7, within which latter box the lever mechanism is contained.

The whole device is adapted to rest upon one of the cross-ties over which the rails are
110 laid and preferably exterior to the line of the rail. The end of the box contiguous to the rail is so shaped as to fit the space formed by the head, the web, and the bottom flange, and this locks this end of the box in place with its
115 top, as before stated, approximately level with the top of the rail and forming a surface over which the torpedoes move from the magazine. The opposite end of the box has a projection at the bottom with holes which serve to receive spikes, as at 20, and the whole device is thus firmly secured. The cover of the box carries a magazine, and the magazine has a separate cover. Both of these covers are locked
120 by hasps and staples, as follows: The cover of the main box is secured by a hasp 21, turnable about a staple upon the end of the box, as at 22, and conforming to the outline of the upper part of the box, the cover, and the side of the magazine 7^a. Upon the magazine 7^a is a
125 130

staple 23, and the upper end of the hasp 21 is slotted to fit over this staple. The cover of the magazine 7^a is hinged or otherwise adapted to close down upon the top of the magazine, and this carries a second hasp 24, the lower end of which fits over the same staple 23, so that a single locking device passed through the staple 23 secures both the cover of the magazine and the cover of the casing.

10 When the magazine is to be recharged, it is only necessary to disengage its cover and open it.

When access to the main casing is desired, the hasp 21 is disengaged and the cover of the case 7 is in condition for opening.

I have here described the device as being operated by mechanical means; but it will be manifest that it might be operated by compressed air acting through pipes upon pistons moving in cylinders and having the piston-rods connected with the actuating-levers 5 at each torpedo-station or by means of an electrical circuit and mechanism, which could be actuated thereby.

25 A motor or other well-known electrical device at each station would serve to move the torpedoes on or off the track.

I do not desire to limit my invention to any particular mechanism by which the movement of the torpedoes is effected.

The cable 6 may be connected with a switch-lever, as at 6^a, so that when the cable is pulled to deposit a torpedo a switch will be opened to lead the train off the main track to either a side track or a derailling device.

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

1. A railway signaling device, consisting of one or more torpedoes, said torpedoes having rearwardly-extending members and lugs near their upper ends by which they are supported, supports upon which said torpedoes are carried, contiguous to the line of track, and mechanism engaging the extended portion of the torpedo by which the torpedoes may be projected above the line of the track or removed therefrom.

2. A railway signaling device, consisting of one or more torpedoes having rearward extensions and supporting-lugs, carriers by which they are actuated, said carriers engaging said extensions, supports with which the carriers are connected contiguous to the track, mechanism connecting the torpedoes with a distant station whereby they may be moved to stand above the line of the track and form a danger-signal to an approaching train, or removed therefrom.

3. A railway-signal consisting of a plurality of torpedoes mounted upon carriers, said torpedoes having rearward extensions provided with upturned ends, and mechanism including a slide having a member to engage the upturned end of the torpedo extension by which

the torpedoes may be projected above the line of the track or removed therefrom, connections between said actuating mechanism and a distant station from which the movement of the torpedoes may be effected, and housings contiguous to the track within which the torpedoes are normally concealed and protected and from which they are projected over the track.

4. The combination in a railway signaling device of a torpedo-containing magazine and housing, torpedoes having rear extensions having an upwardly-projecting portion, carriers engaging said projecting portion of the torpedoes by which the torpedoes are successively advanced upon the track and retracted, and means for discharging the expended torpedoes.

5. In a railway signaling device, a torpedo-containing device and housing, guides upon which a plurality of torpedoes are superposed, torpedoes having lugs to fit said guides and having rearward-extending portions provided with a member to be engaged, a mechanism and actuating devices by which the lowermost torpedo is advanced upon the guides and deposited upon the track, and retracted beneath the track after being exploded, and a discharge through which the spent torpedo is ejected.

6. In a railway signaling device, torpedoes having rearward extensions provided with a member to be engaged, said torpedoes having lugs projecting from opposite sides, guides upon which the lugs rest, and a mechanism engaging the said member by which the torpedo is advanced between the guides.

7. In a railway signaling apparatus, torpedoes having lugs projecting from the upper edges, parallel guides upon which the lugs rest, with the torpedo between them, mechanism by which the torpedo is advanced and deposited upon the rail, and by which it is retracted, with the lugs beneath the guides, after being exploded and flattened by the passing wheels, and means for ejecting it.

8. In a railway signaling apparatus, torpedoes having rearward extensions and transversely-projecting lugs, a magazine and casing with guides upon which the lugs are supported with the torpedo approximately in the plane of the track-surface, mechanism engaging the rearward extension of the torpedo, to advance or retract it with relation to the track, with the lugs of an unexpended torpedo retained above the guides, and movable beneath the guides after the torpedo has been flattened by passing wheels.

In witness whereof I have hereunto set my hand.

RUSSELL AVERY

Witnesses:

S. H. NOURSE,
JESSIE C. BRODIE.