

No. 677,387.

Patented July 2, 1901.

V. VON NEUMAN.
DETONATOR FOR RAILWAY SIGNALING.

(Application filed Apr. 21, 1900.)

(No Model.)

Fig. 1

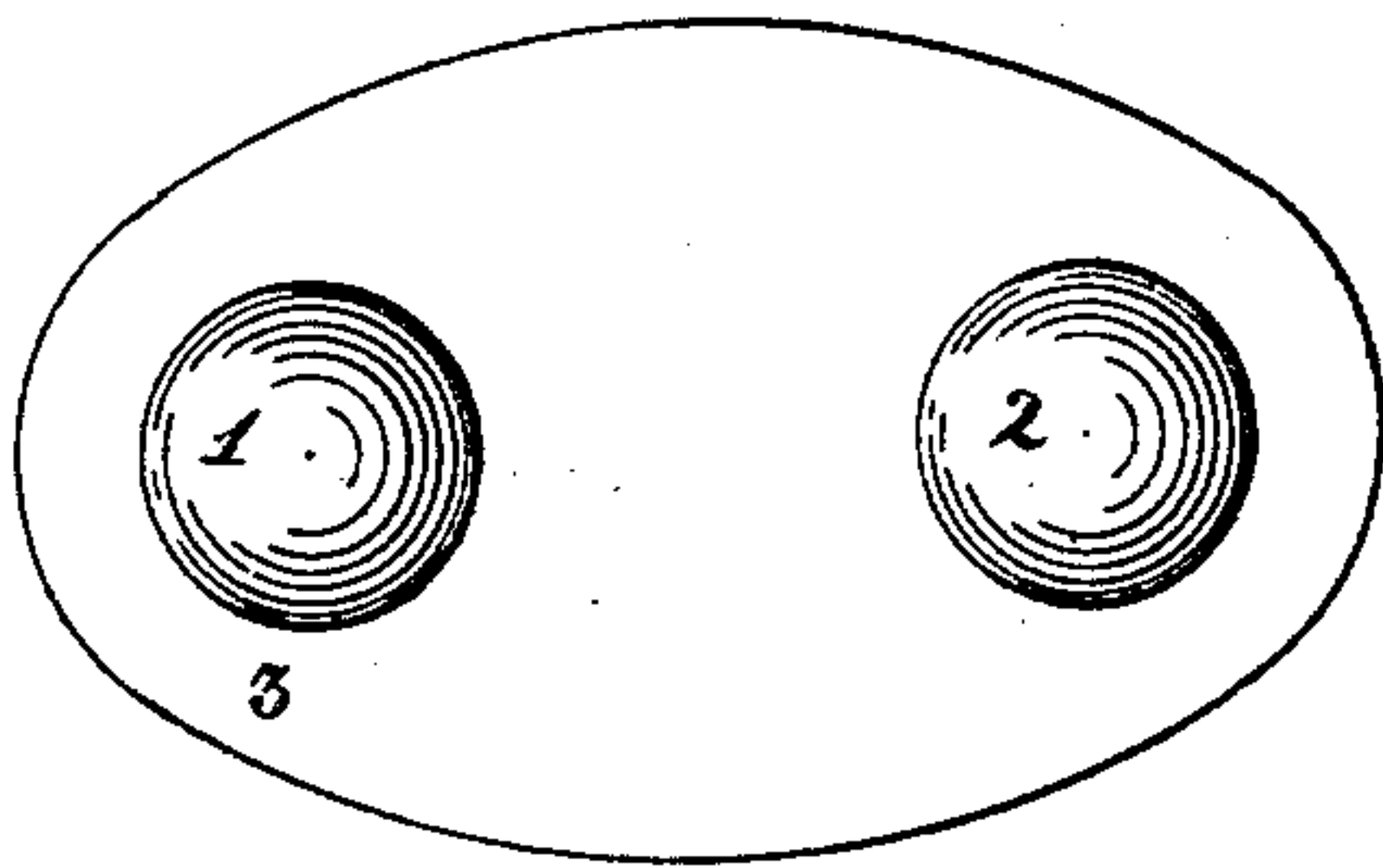


Fig. 3

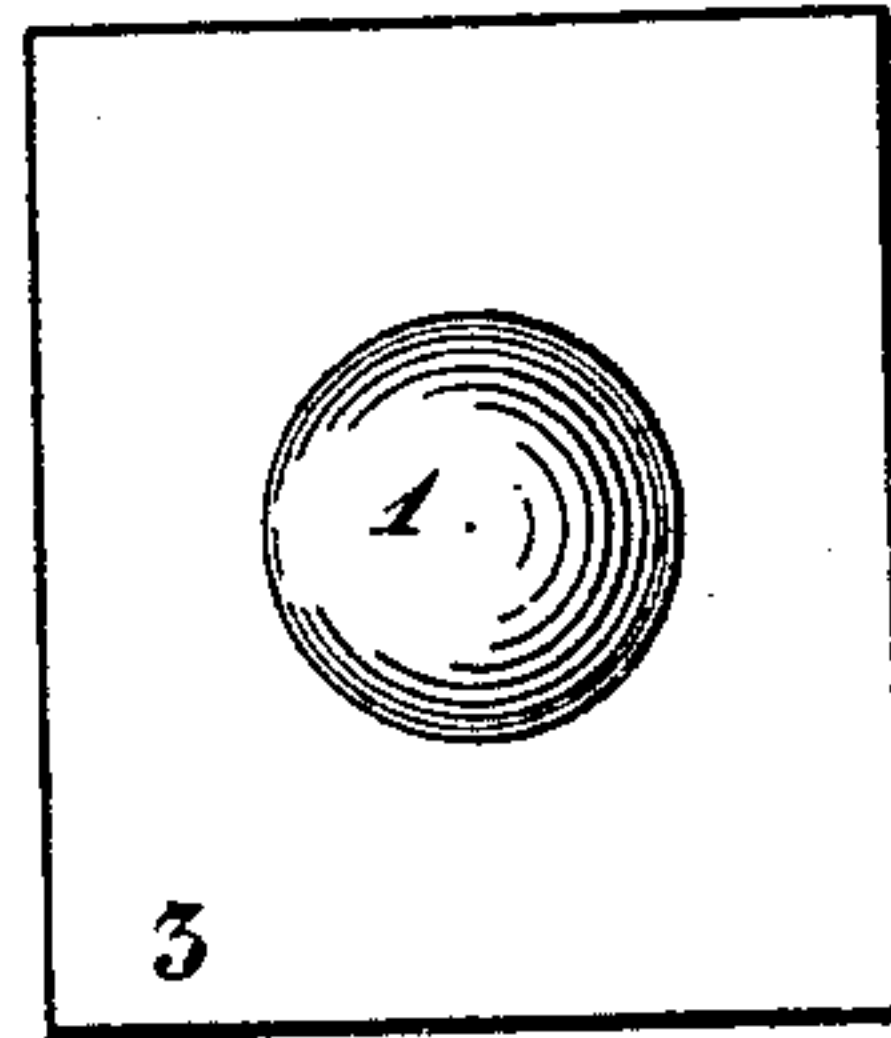


Fig. 2

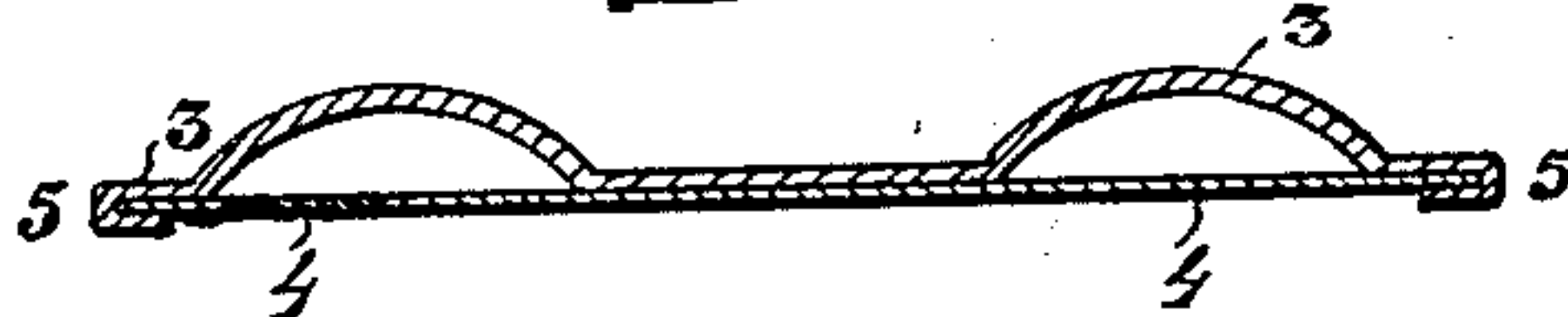


Fig. 4

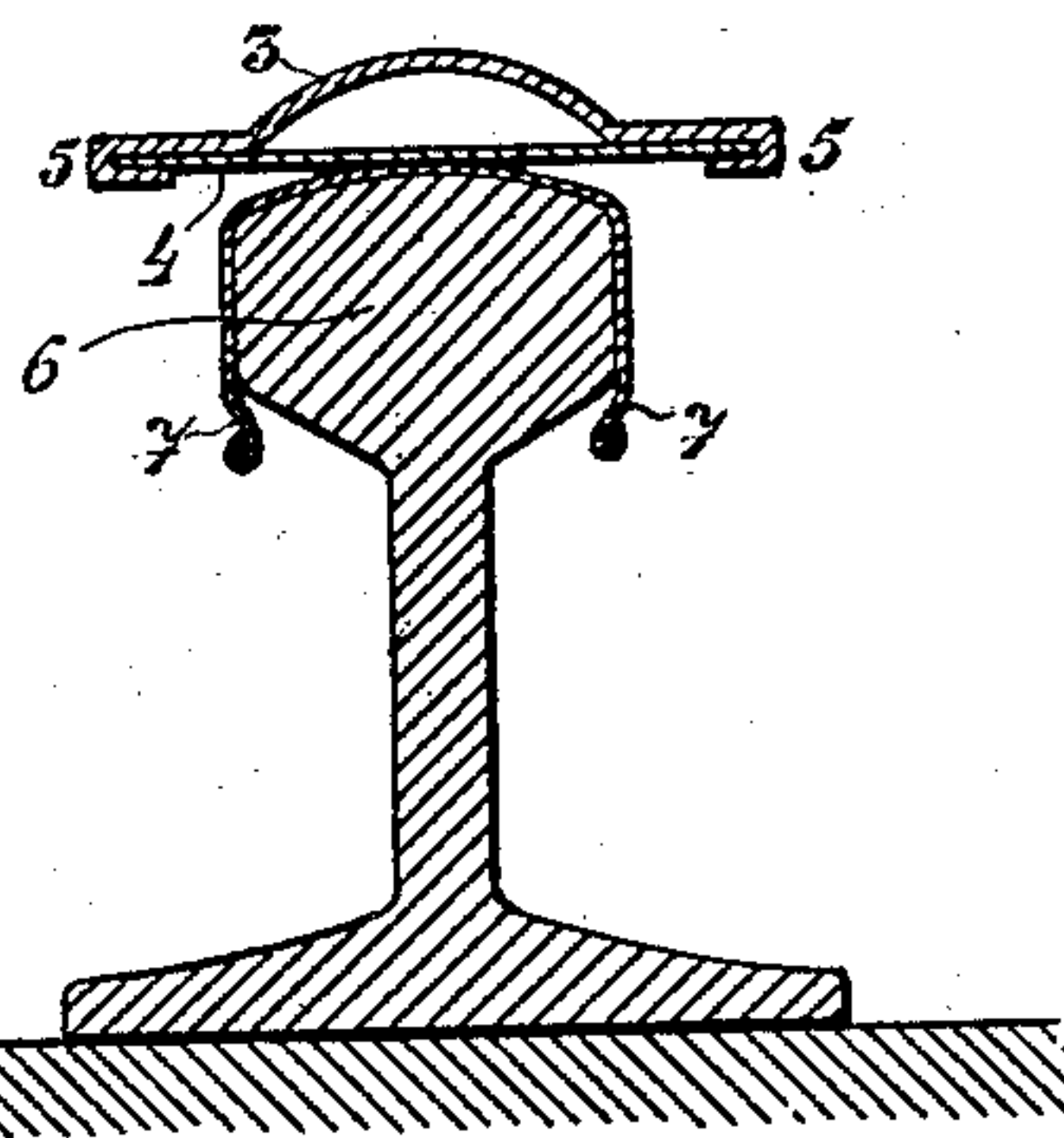
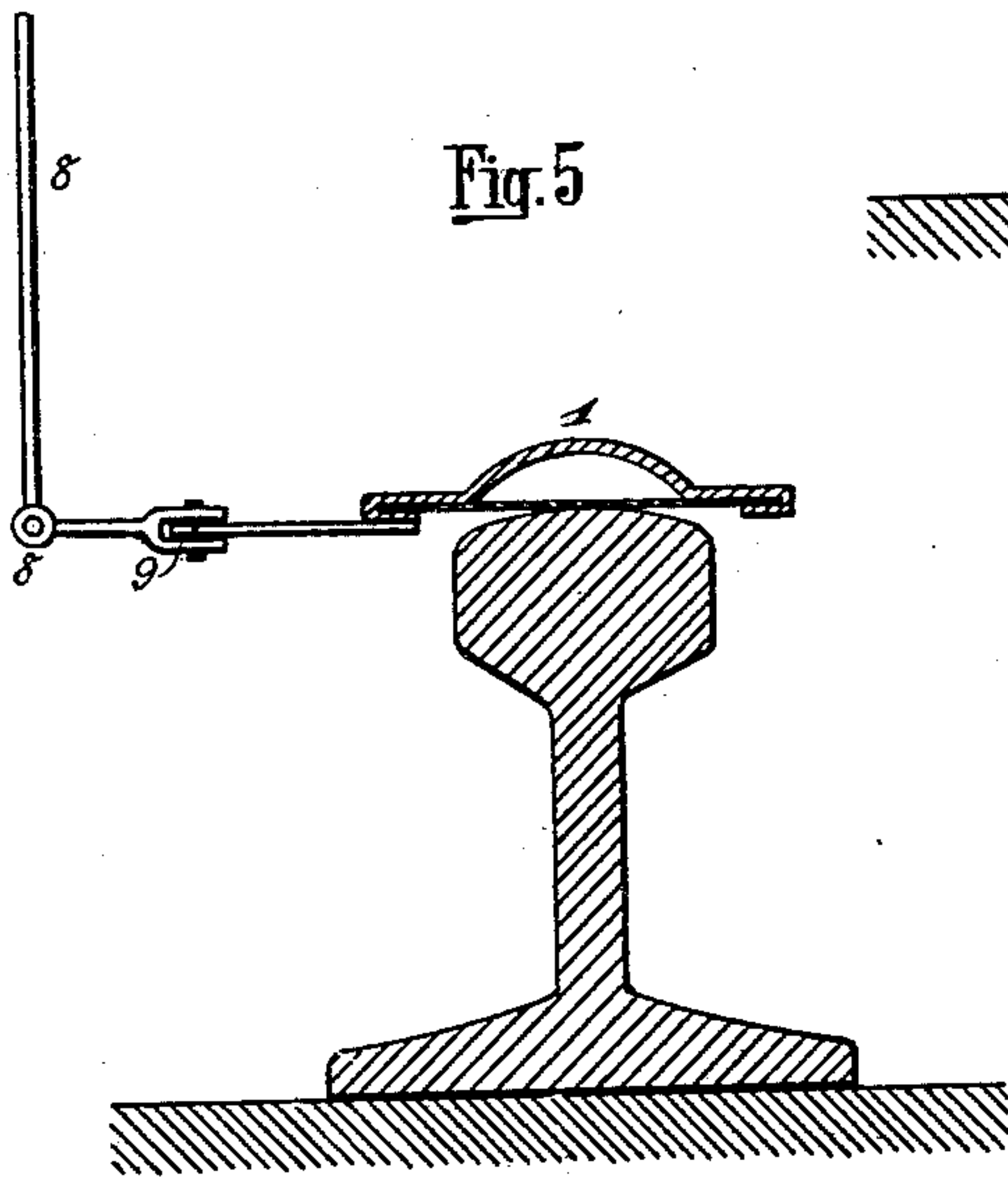


Fig. 5



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UNITED STATES PATENT OFFICE.

VICTOR VON NEUMAN, OF VIENNA, AUSTRIA-HUNGARY.

DETONATOR FOR RAILWAY SIGNALING.

SPECIFICATION forming part of Letters Patent No. 677,387, dated July 2, 1901.

Application filed April 21, 1900. Serial No. 13,774. (No model.)

To all whom it may concern:

Be it known that I, VICTOR VON NEUMAN, manufacturer, a citizen of the Empire of Austria-Hungary, residing at 13 Riemergasse, Vienna, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Detonators for Railway Signaling; 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 safety cartridges or detonators for railway signaling, which are placed upon the rails and caused to explode by the wheels of the train passing over them. Such detonators should fulfil the following requirements: First, they should explode with a report sufficiently loud to be overheard by the engine-driver under the most unfavorable conditions as regards weather; second, they should be capable of withstanding shock, damp, and other accidental external influences, and yet permit of storage without deterioration, and, third, when detonated by the impact of the wheel they should not cause a scattering or dispersion of fragments and splinters.

Although the first two requirements are more or less completely fulfilled by the explosive fog-signals now commonly in use, the third requirement has not yet been successfully met (except when using special protective caps)—that is to say, there is no known detonator which when exploded will not cause fragments or splinters to be hurled through the air at the risk of injuring bystanders or adjacent objects.

The object of this invention is to provide a detonator which will fulfil all three of the above requirements.

With this object in view a detonator embodying my invention consists in the features, arrangements, and combination of parts as hereinafter described, and pointed out in the claims.

Heretofore the casings have been of uniform strength or resisting power throughout, whatever the material employed, and consequently the charge when exploded has to overcome a uniform resistance in all directions, and hence a location of the point at which

the gaseous products of explosion make their escape has been a matter of chance and not of certainty. Therefore since the casing was prevented from bursting out on the rear and inner sides by reason of the rim and flange of the wheel bearing on these portions of the casing the latter usually burst toward the outer side of the rail in a forward direction or at the point of greatest danger, the danger having increased by reason of the custom of employing stable high explosives almost exclusively in order to enable the detonators to fulfil the two first requirements mentioned above. To remedy this defect, the casing, according to the present invention, is constructed in such a manner that the power of resistance of the parts of which the same is composed differs, the top part being much stronger in this respect than the bottom. These parts of the casing are fastened together, so as to constitute a water-tight joint where their edges meet, the detonating charge being inclosed between the two parts. When the explosion takes place, the weaker (lower) part is separated from the upper part along the joint, the lower portion under the disruptive influence of the expanding gaseous products of combustion being disconnected from the upper part along such joint and bent downward over the head of the rail, while the stronger (upper) part remains unaltered, thus constituting a shield which guards against the upward or lateral projection of any small fragments, deflecting them downward in the immediate vicinity of the rail, thereby rendering them innocuous.

In place of the mercury fulminate hitherto employed for the detonating charge black powders of low explosive force and stability are preferably employed in detonators embodying the present invention, the said detonating charge being combined with one or more ignition-caps mounted on nipples.

In order to render this improved signal visible, as well as audible, it is advisable to combine the explosive charge with illuminating charges, as are well known in pyrotechnics.

The attachments of the casing of these new signals to the rails may be effected in any suitable way hitherto practiced and governed by the peculiar circumstances of each case.

I will now give a description in detail of

my invention, reference being had to the accompanying drawings, in which—

Figure 1 represents in top plan, and Fig. 2 in vertical longitudinal section, a double detonator embodying my invention in one of its preferred forms. Fig. 3 represents a top plan of a single detonator under my invention; Fig. 4, a vertical section of the same, showing the same attached to a rail; and Fig. 5, a similar view showing another method of holding the same on a rail.

It will be noted from the drawings that a detonator embodying my invention is composed of an upper shield-plate B, having one spherical or similar shaped chamber or recess 1 for the reception of the explosive, as represented in Figs. 3, 4, and 5, or several such chambers 1 2, as shown in Figs. 1 and 2. To the upper shield-plate 3 is secured a lower closing or base plate 4, which lies flat against the plane portions of the shield-plate and which is secured to the said shield-plate by any suitable joint along the contiguous edges of the two plates—such, for example, as an overlapping seam or joint 34, as shown in Figs. 2, 4, and 5, produced by upsetting or bending over the flange 5 of the shield-plate 3 onto the outer edges of the plate 4.

The shield-plate 3 is made considerably stronger than the closing-plate 4—for example, by making it of thicker sheet or other metal—and the seam or joint 34 is preferably of such strength as to cause the same to be severed under the stress of the explosive.

As indicated in Fig. 4, the detonator is provided with means for mounting the same on the rail 6—for example, a clamp 7, as shown in Fig. 4, said clamp being attached or secured to the detonator in any suitable way—for example, by riveting or soldering it to the closing or base plate 4. Under this construction the detonator is mounted on the rail by simply causing the clamp 7 to engage the same, as shown in Fig. 4.

In Fig. 5 is represented another means for holding the detonator on the rail, which consists of a bell-crank 8, in the forked arm 88 of which is pivoted a swinging lever 9, to which is secured the detonator. The swinging lever allows the detonator to be accurately adjusted on the rail, while the bell-crank permits the detonator to be lifted off from or lowered onto the rail.

In operation, if after the detonator or cartridge above described has been placed or mounted on the rail 6 and a train passes thereover, the wheels thereof in passing over the convexity of the chamber or chambers 2 bear on the same with sufficient force to detonate the charge of explosive. Under the

stress of this explosion the lower base-plate 4 will be either ruptured or severed from the seam or joint 34 and laid or bent over the rail, whereby the products of the explosion will be directed only downward. This is for the reason that the shield-plate 3 is made stronger or of thicker material than the base-plate 4.

The joint or seam 34, though the same can be made weaker than the base-plate 4, is still sufficiently strong to form a water-tight joint or one that will prevent the access of moisture or other deteriorating matter to the explosive charge.

What I claim, and desire to secure by Letters Patent, is—

1. A detonator for railway signaling consisting of an upper shield-plate and a lower base-plate comprising a chamber for detonating explosives between them and suitably connected together, the upper shield-plate being stronger than the lower base-plate.

2. A detonator for railway signaling consisting of an upper shield-plate and a lower base-plate comprising a chamber for detonating explosives between them and connected together by a seam, the upper shield-plate being stronger than the base-plate and the seam being of such a strength as to release the base-plate under the stress of an explosion.

3. A detonator for railway signaling consisting of an upper shield-plate provided with a chamber or chambers for the explosive charge in combination with a flat base-plate connected to the shield-plate.

4. A detonator for railway signaling consisting of an upper shield-plate and a lower base-plate connected therewith in combination with means for holding the detonator on the rail.

5. A detonator for railway signaling consisting of an upper shield-plate provided with a chamber or chambers for an explosive charge, a lower base-plate secured thereto by a lap-seam, the lower base-plate being of less strength than the shield-plate.

6. A detonator for railway signaling consisting of an upper shield-plate provided with a chamber or chambers for an explosive charge, a lower base-plate secured thereto by a lap-seam, the lower base-plate being of less strength than the shield-plate, and the lap-seam of such strength as to release the base-plate under the stress of the explosive.

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

VICTOR VON NEUMAN.

Witnesses:

VINCENT DIEHL,
ALVESTO S. HOGUE.