

[54] **CLOSING DEVICE FOR MOVABLE PARTS
IN RAILWAY FROG AND CROSSING
AREAS**

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246/415

[56] **References Cited**

UNITED STATES PATENTS

3,697,747 10/1972 Edeling et al. 246/468

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[57] **ABSTRACT**

A closing device for movable parts suitable for closing inner edge gaps in the frog and deflection areas of switch points or crossings is disclosed including, in a wedge or filler part, a clamp which is rotatable about an axle and, at the free end thereof facing away from the axis of rotation, has a fishtail-shaped prong end which, on the one hand, engages in a corresponding recess in a bearing surface bottom which is inclined before the recess, a slide rod is guided within a groove, is displaceable along the wedge or filler part, and comprises a barb or hook into which the uppermost prong of the clamp can become engaged so that, during a movement of the slide rod in the direction toward the prong, the clamp will come to be engaged and hence be carried along therewith.

4 Claims, 4 Drawing Figures

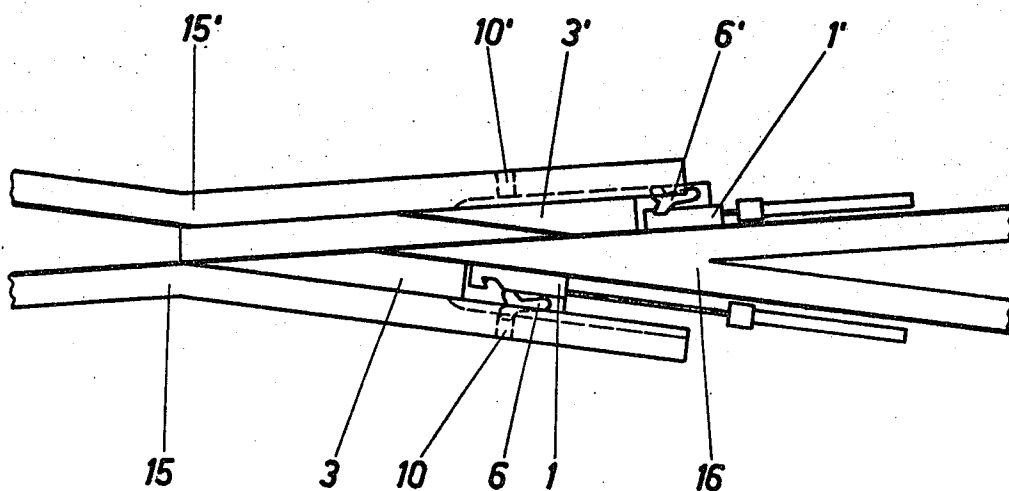


FIG. 1

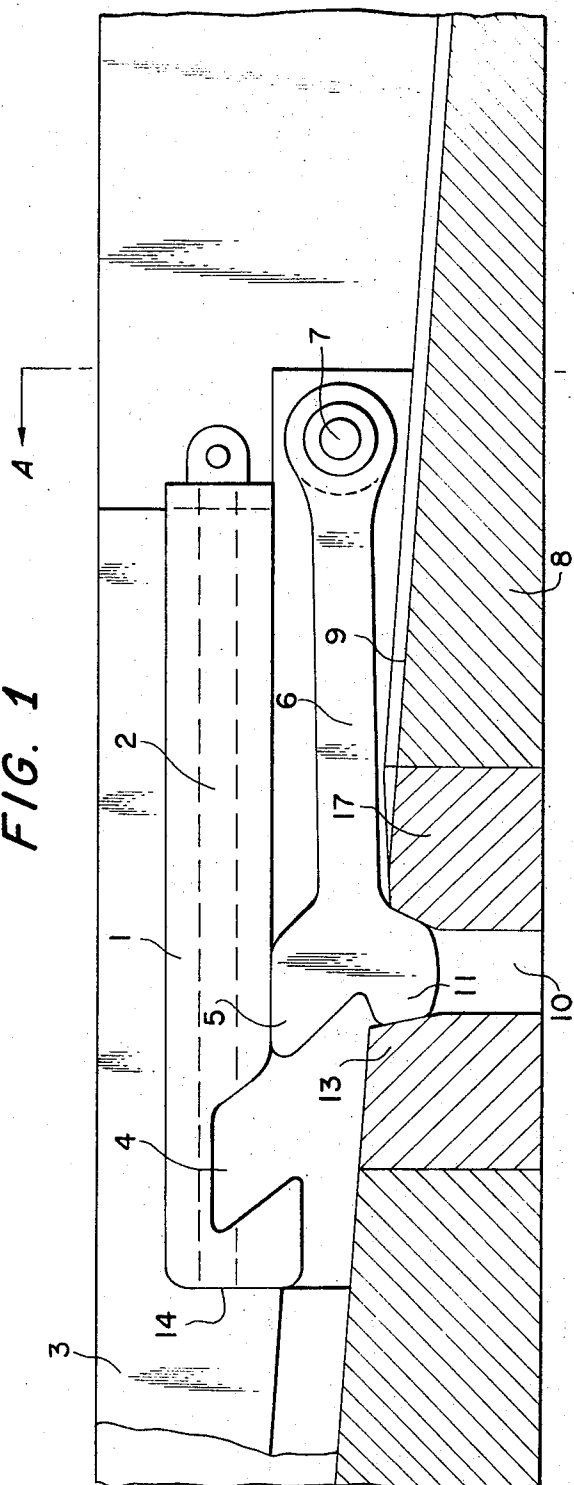
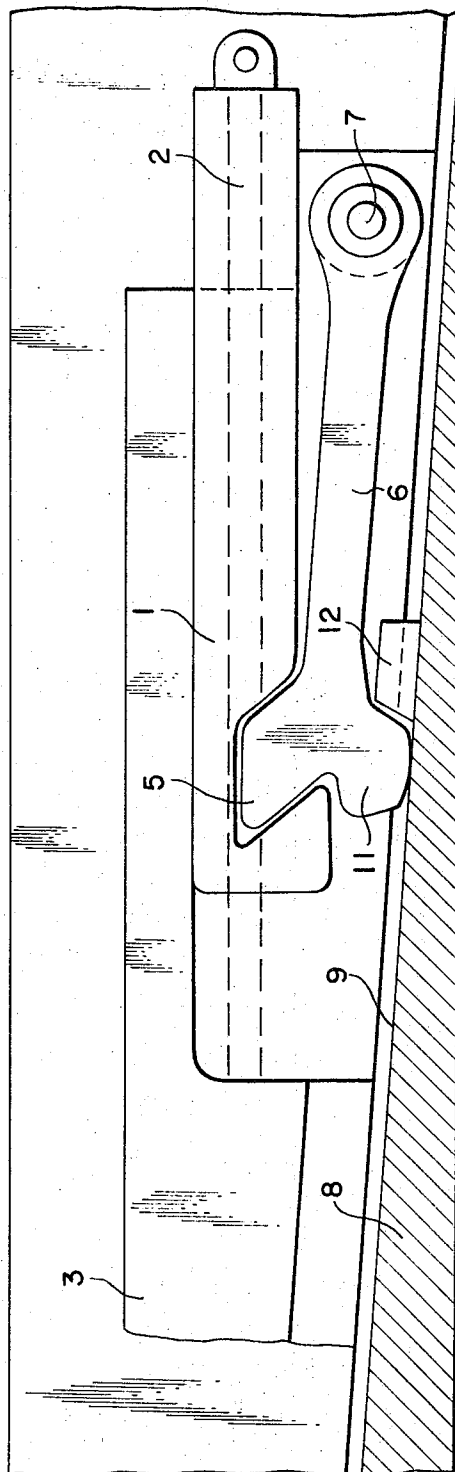


FIG. 2



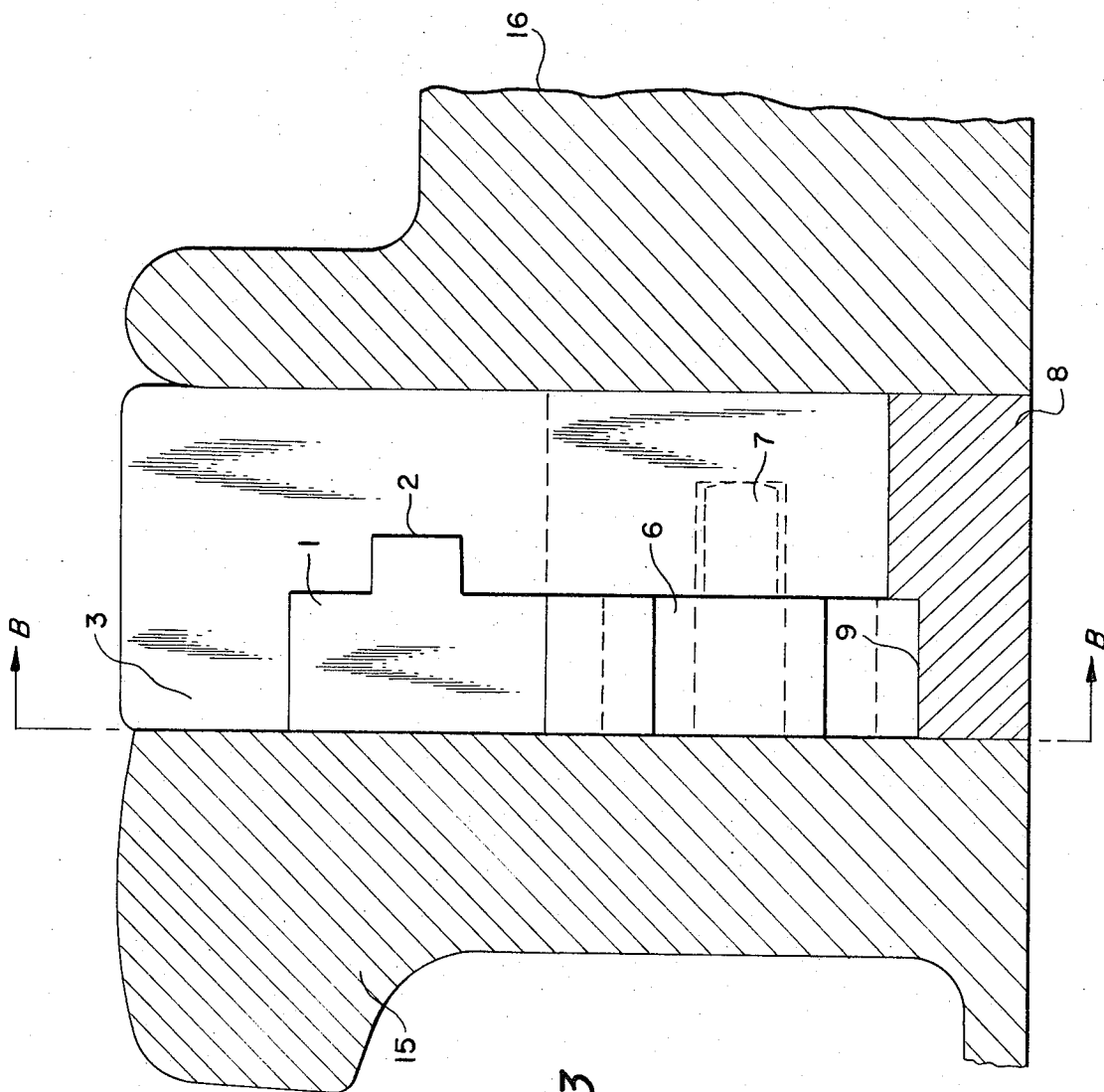


FIG. 3

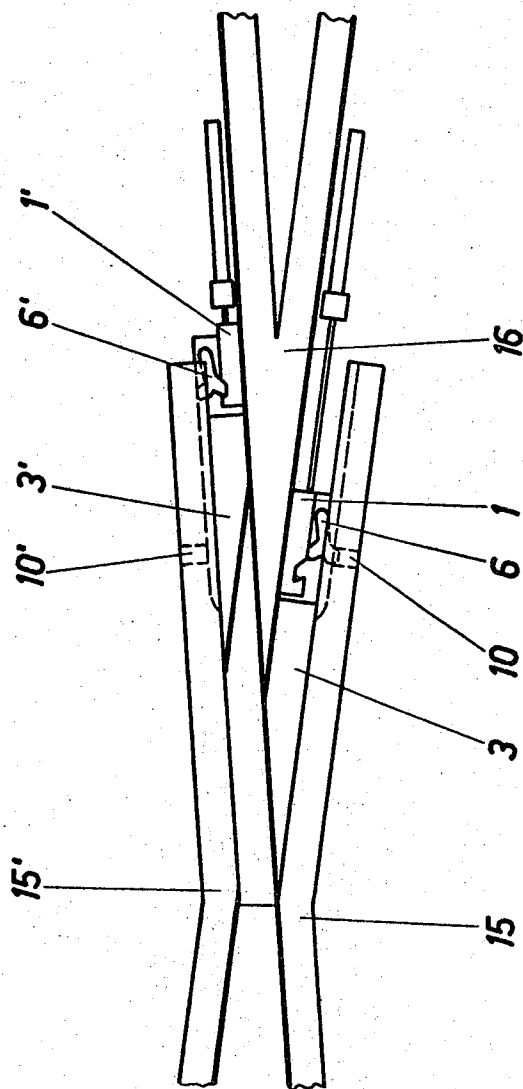


Fig. 4

CLOSING DEVICE FOR MOVABLE PARTS IN RAILWAY FROG AND CROSSING AREAS

The present invention relates to a closing device for movable parts which are suitable for closing inner edge gaps in the frog and deflection areas of switch points or crossings.

These movable parts must be so locked in the front position thereof that any sliding or slipping off toward the rear - even under a traffic load - is rendered impossible. It is desirable that the closing device requires essentially no maintenance and is free from tendencies to breakdown.

It is known from U.S. Pat. No. 1,933,451 that, for example, wedge-formed wedge-formed parts for frogs with a closed wheel over-run are so locked in the front or forward position thereof that bolts are laterally positioned at the guide rails, moved with the aid of hydraulic, pneumatic, or electromagnetic drives, and slide into receiving bores in the wedge-formed parts.

In order to rigidly lock these movable wedge-formed parts, very close tolerances must be maintained. These bolts will jam between the wedge parts and the guide part and the bolt operates perfectly synchronously. A perfect operation of this locking device is possible only if the wedge parts in the end positions thereof are brought by the drive exactly into the end positions thereof. If such is not the case, jamming will occur, rendering the apparatus inoperative.

The present invention provides a closing device for such wedge parts or movable parts in which the disadvantages referred to are obviated.

In accordance with the present invention, there is positioned in a wedge or filler part, a clamp which is rotatable about an axle and, at the free end thereof facing away from the axis of rotation, has a fishtail-shaped prong end which, on the one hand, engages in a corresponding recess in a bearing surface bottom which is inclined before the recess, a slide rod is guided within a groove, is displaceable along the wedge or filler part, and comprises a barb or hook into which the uppermost prong of the clamp can become engaged so that, during a movement of the slide rod in the direction toward the prong, the clamp will come to be engaged and hence be carried along therewith.

Established as a result thereof is a force-locking connection between the wedge or filler part and the frog body.

In a suitable further embodiment of the present invention, the engaging surfaces of the fishtail-formed prong end and of the barb or hook in the slide rod and the recess have an inclination of more than 55° in the bearing surface bottom. This has the effect that, taking into account the driving or retaining force to be transmitted, the vertical component at the surfaces of the clamp is considerably smaller than the horizontal components.

According to a further embodiment of the present invention, the part in the vicinity of the recess within the bearing surface bottom is made from a particularly high-strength material and is disposed in the bearing surface bottom in a manner such as to be adjustable or re-adjustable.

The closing device also may be selectively disposed so as to be turned in each case by 90° about the longitudinal axis thereof. This means that, in this case, the

clamp will no longer engage in the bottom of the guide surface, but in a corresponding recess of the wing rail. While, in the arrangement referred to first, the clamp will move in a vertical direction, it will move horizontally in the arrangement referred to last, which is turned by 90°.

The advantages that are achieved with the aid of the present invention consist in that only one drive aggregate is needed for the movement of the wedge or filler part or piece, and for the locking and/or unlocking operations. The tolerance of the structural elements may be chosen in accordance with the rough open line operation of working conditions.

Selected as one embodiment of the present invention is a frog with a wedge-closed wheel over-run. A preferred embodiment is explained by way of example on the basis of and with reference to the accompanying drawings, wherein

FIG. 1 is a side view of a wedge piece or part in the forward end position thereof; and disposed at the rear end of the wedge is the closing device as proposed by the present invention,

FIG. 2 is a side view corresponding to FIG. 1 but, in this case, the wedge piece or portion has reached the rear end position thereof,

FIG. 3 is a cross-sectional view taken along line A—A.

FIG. 4 is a top plan view of a frog with a wedge-type closed wheel over-run with the inventive closing device shown in an arrangement turned about 90°.

The connecting rod of the drive aggregate is connected with the slide rod 1 which is slidably positioned with the guide track 2 thereof within the wedge part 3 and is provided with a barb or hook for purposes of receiving the uppermost prong 5 of the clamp 6. The clamp 6 is pivotally mounted on the axle 7 in the wedge or filler part or piece 3. The bearing surface bottom 8, 17, is provided with a guide groove 9 and arranged at the forward end of the latter is a recess 10 for receiving the lower prong 11.

The wedge part or piece 3 is locked in the front or forward position thereof by virtue of the fact that the lower prong 11 of the clamp 6 engages in the recess 10 of the bearing surface bottom 8, at which time the slide rod 1 is positioned above the upper prong 5 of the clamp 6 so that any lifting-out of the lower prong 11 of the clamp 6 is rendered impossible, see FIG. 1. The inclination of the surfaces of the lower prong 11 of the clamp 6 is so chosen in conformity with the inclination of the recess 10 in the bearing surface bottom 8 that in view of the retaining force to be transmitted, the vertical component is considerably smaller than the horizontal component.

In order to bring the wedge piece 3 into the lower end position thereof, the following sequence of operations is required:

The connecting rod of the drive aggregate moves the slide rod 1 rearwardly until the latter strikes with the front nose of the barb 4 thereof against the upper prong 5 of the clamp 6 and subsequently lifts the lower prong 11 of the clamp 6 out of the recess 10 in the bearing surface bottom 8. There now exists a force-locking connection between the slide rod 1, the prong 5 of the clamp 6 and the wedge piece or part 3. The drive aggregate now pulls the wedge piece or part to the lower end position thereof, FIG. 2.

The limitation of the rearward position may be effected by the drive aggregate itself, or by a stop 12 in the guide groove 9 against which the clamp 6 strikes. Due to the force-locking connection between the slide rod 1, the clamp 6, and the wedge part 3, the wedge portion 3 will be moved forwardly with the aid of the connecting rod of the drive. The wedge part 3 reaches the forward end position thereof when the clamp 6 has been carried along to the recess 10 in the bearing surface bottom 8, whereby the lower prong 11 strikes against the stop 13 at the end of the guide groove 9. Due to the continued movement of the slide rod 1, the upper prong 5 of the clamp 6 is forced out of the barb or hook 4 of the slide rod 1, and the lower prong 11 is pressed into the recess 10 in the bearing surface bottom 8. The slide rod 1 is possibly pushed by the drive to the stop 14 of the wedge piece 3, at which time the lower edge of the slide rod 1 prevents the clamp from bypassing the recess 10.

The lateral guide of the wedge piece 3 with the clamp 6 and the slide rod 1 is assured by the frog point 15 and the wing rail 16, see FIG. 3. The same principle is conceivable also for an arrangement designed for closing gaps within the tongue area or region with pivotal rails.

During the advancing movement of the wedge piece 3, the transmission of force between the slide rod 1 and the clamp 6 takes place by way of the rearward surface of the barb or hook 4 of the slide rod 1 and by way of the rearward surface of the upper prong 5. In order to prevent at that time a jamming of the upper prong 5, or of the clamp 6, and in order to reduce the wear and tear between the lower prong 11 and the guide groove 9, these surfaces are preferably provided with an inclination of more than 55°, and pass over into a thrust curve only in the rearward part. As a result, the vertical force component becomes smaller than the horizontal force component.

The inclination of the recess 10 of the bearing surface bottom 8 suitably should be made from a particularly high-strength material. As a consequence thereof the wear and tear is reduced, and a readjustment and adjustment of the precise position of the recess 10 in relation to the end position of the wedge 3 is rendered possible.

In an arrangement which is turned about 90°, as shown in FIG. 4, the recesses 10 and 10' are no longer

positioned in the bottom of the guide surface 8, but in the wing rails 15 and 15'. Analogously to the description of the closing device in the vertical position, FIG. 4 shows the wedge piece 3 with the clamp 6 and the slide rod 1 in the front or forward end position thereof, while the edge part 3', the clamp 6', and the slide rod 1' are positioned in the rearward end position thereof.

It will be obvious to those skilled in the art that many modifications may be made within the scope of the present invention without departing from the spirit thereof, and the invention includes all such modifications.

What is claimed is:

1. A closing device for movable parts suitable for closing inner edge gaps within the frog and deflection areas of switch points or crossings, comprising wedge means positioned between a frog point and wing rail, clamp means rotatably secured at one end thereof to said wedge means,

fishtail-shaped prong end means at the other end of said clamp means,

inclined bearing surface means between said frog point and wing rail and having a recess therein in which the lower prong of said fishtail-shaped prong end means is adapted to be received,

and slide rod means displaceable along said wedge means and having hook means thereon adapted to engage with the upper prong of said fishtail-shaped prong end means, whereby during movement of said slide rod means in the direction toward said upper prong, the clamp means will be engaged and carried along.

2. A closing device according to claim 1 in which the engaging surfaces of the fishtail-shaped prong end means and of the hook means on the slide rod means, and in said recess have an inclination of more than 55° in said bearing surface means.

3. A closing device according to claim 1 in which the portion in the vicinity of said recess in the bearing surface means is made from a particularly high-strength material and is mounted in the bearing surface means in a manner so as to be adjustable and re-adjustable.

4. A closing device according to claim 1 which selectively may be mounted so as to be turned in each case about 90° about the longitudinal axis thereof.

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