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RAIL HEAD CLAMP

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Fig. 2.

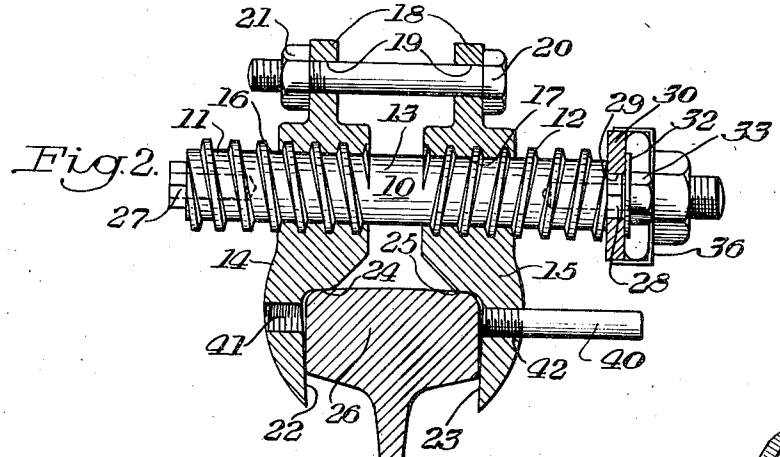
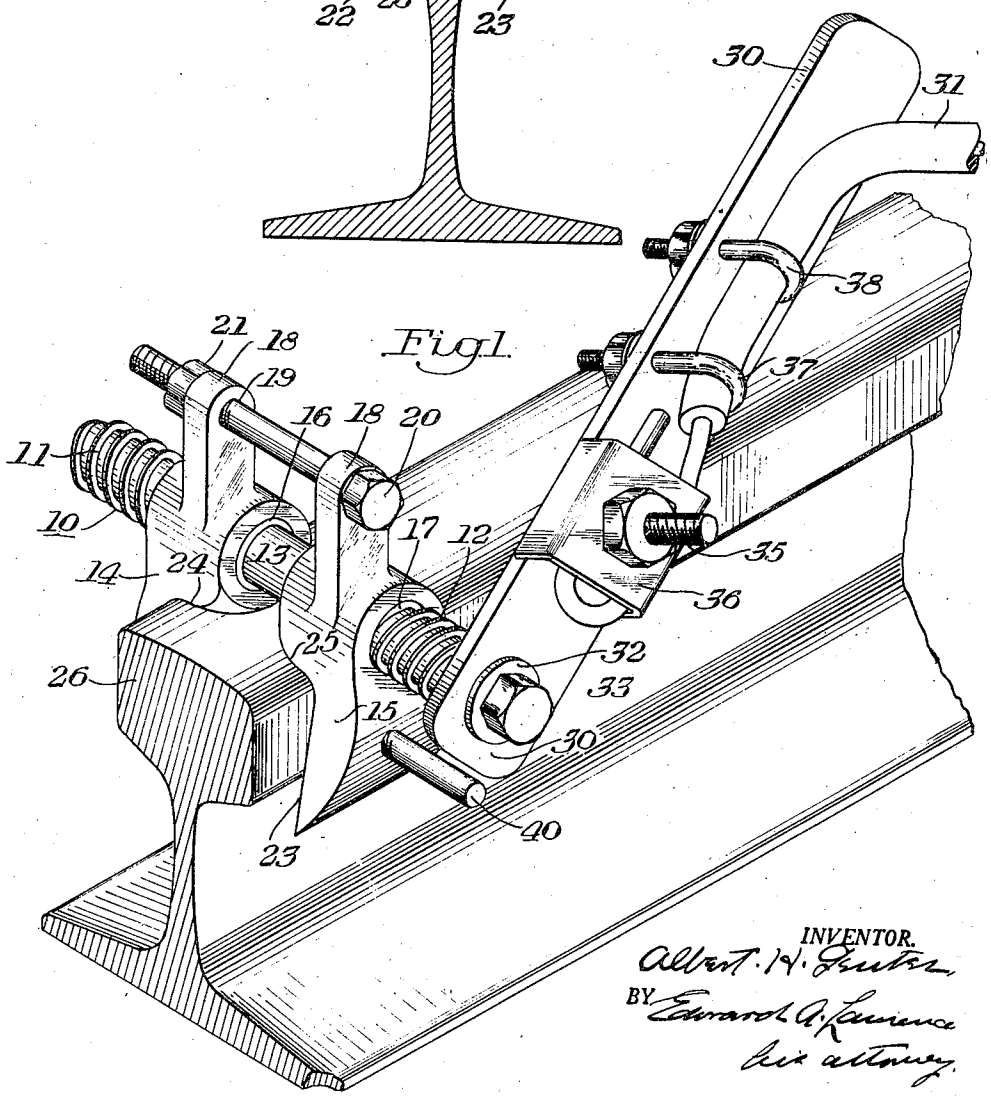


Fig. 1.



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RAILHEAD CLAMP

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3 Claims. (Cl. 173—324)

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This invention relates generally to rail clamps and more particularly to a clamp for connecting a return circuit cable to the ball or head of a rail.

Mine locomotives are required to gather loaded mine cars from and deliver empty cars to the mining face or loading positions on spur tracks laid in rooms off the main hall along which electrical power circuits are permanently strung. The rails of the spur tracks are not bonded nor are they supplemented with power and trolley wires. It is therefore necessary for the locomotive to be provided with cables carried on drums or reels for supplying propulsion energy while traveling over these spur tracks. One cable is provided with a trolley wire feeder tap or other similar connection to be attached to a feeder or trolley wire and the other cable is provided with a clamp for attachment to the rail for the return circuit. This invention is directed to the return rail clamp which may be applied by the locomotive engineer without leaving his station on the locomotive.

The principal object of this invention is the provision of a metal return circuit clamp that may be quickly applied and removed from the rail head.

Another object is the provision of a metal rail head clamp that tightens on the rail head by the weight and pull of the cable attached thereto.

Another object is the provision of a metal rail clamp that may be applied and released by one hand.

Another object is the provision of a metal rail clamp that is readily adjustable for different size rail heads.

Another object is the provision of a metal rail head clamp having quick acting jaws which move in unison when clamped or unclamped from a rail head.

Another object is the provision of a metal rail head clamp that is operable within adjustable defined limits insuring quick positive clamping on a rail head.

Another object is the provision of a pair of rail head clamping jaws that lock on the rail head as the clamping pressure is applied.

Another object is the provision of a lever actuated double movable jaw clamp that may be applied and removed from a rail head in less than 180° swing of the lever.

Other objects and advantages appear in the following description and claims.

A practical embodiment illustrating the principles of this invention is shown on the accompanying drawing wherein:

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Fig. 1 is a perspective view of the clamp applied to a rail head.

Fig. 2 is a sectional view taken along the axis of the clamp screw.

Referring to the drawings, the return rail head clamp is assembled on the screw shaft 10 which is relatively large in diameter and is provided with a right and left hand screw thread 11 and 12 and an intermediate reduced section 13 between the threads. A pair of jaw members 14 and 15 are provided with aligned holes which are threaded as indicated at 16 and 17 to receive the right and left hand threads respectively of the screw shaft 10. Each jaw member is provided with an upwardly extending boss 18 having a hole 19. When the jaws are threaded on the shaft 10 and the holes 19 are aligned to receive the bolt 20 which is provided with the nut 21 the bolt 20 maintains the jaw members 14 and 15 in alignment on the shaft 10. The holes 19 in the bosses 18 are sufficiently large to pass the bolt 20 but snugly fit the latter to prevent the jaw members from being turned out of substantial alignment on the shaft 10.

Owing to the fact that the shaft threads 11 and 12 are right and left hand respectively, rotation of the shaft 10 in one direction will draw the jaw members toward one another while rotation of the shaft in the opposite direction will move each jaw member away from one another and from the intermediate reduced section 13.

The depending portions of the jaw members 14 and 15 are provided with gripping faces 22 and 23. Each gripping face is inclined relative to the axis of the shaft 10 and the longitudinal axis of the jaw members. When the shaft is turned to draw the jaw members together the gripping faces 22 and 23 converge at the lower ends of the jaw members. The lower ends of the jaw members extend below the rail head and the inclined gripping faces contact the lower edge of the rail head to provide a tight wedging engagement. The clearance between the threaded holes 16 and 17 and the threads 11 and 12 on the shaft is taken up as the jaw members are tightened on the rail head. But this clearance is not sufficiently great to make the inclined gripping faces vertical when the jaw members are clamped on a rail head.

The upper ends of the gripping faces extend into the body of the jaw members forming the shoulders 24 and 25 which rest on the top of the

rail head 26, providing a stop for the insertion of the rail head clamp on the rail.

The shaft 10 is provided with squared ends 27 and 28 of hexagon shape to receive the mating socket 29 in the end of the lever 30 which is used to rotate the shaft 10 to clamp and unclamp the jaw members to the ball or head of the rail and is also used for the purpose of connecting the cable 31 to the clamp. The lever 30 is thicker than the squared ends of the shaft so that it extends therebeyond and will be tightly locked in place by the washer 32 and the bolt 33 which is screwed into axially threaded holes in the ends of the shaft 10.

The lever is provided with a transverse hole to receive the bolt 35 that tightens the clamping plate 36 on the bared end of the cable 31 that is twisted around the bolt. In this manner the cable 31 is electrically connected to the bail head clamp.

A pair of spaced U-bolts 37 and 38 are threaded on their ends and pass through aligned transverse holes in the lever 30. Nuts and washers are provided on the other side of the lever 30 to clamp the U-bolts down on the insulated section of the cable 31 and hold it in place, thereby relieving the terminal bolt 35 and clamping plate 36 from a pull or tug on the cable 31.

A stop post 40 is provided with a threaded end for securing it into the threaded holes 41 and 42 in the outer face of the jaw members 14 and 15. This stop pin extends beyond the end of the shaft 10 and prevents the lever 30 from being rotated through 360°. Thus a fixed setting of the jaw members cannot be changed unless the stop pin 40 or one of the two bolts 20 or 33 is removed. If the bolt 20 is removed the clamping jaw not having the stop pin may be rotated in either direction through 360° to adjust the relative positions of the jaw members the distance of one pitch of the threads on the shaft 10. To adjust the jaw members adjacent the lever handle in the same manner either the lever and bolt 33 or the stop pin 40 together with the bolt 20 must be removed. Again the lever may be removed from the squared end of the shaft 10 and the latter rotated to move both jaws simultaneously in either direction and adjust the jaw members. When replacing the lever 30 on the squared end the relative position of the lever and shaft have been changed to provide a selected limit through which the jaws are operated to grip a given size rail head by a short swing of the lever 30. The squared ends 27 and 28 of the shaft 10 being hexagon provide five adjusting positions within a full turn of the shaft 10. This permits the lever 30 to be placed at a 45° angle to the rail when the clamp tightly grips the rail head.

The lever forms the handle of the rail head clamp for the mining locomotive engineer to reach down, drop the jaws over the rail head and draw the lever towards the locomotive. As the locomotive proceeds along the track the cable 31 fastened to the lever is unreeled from the drum. Any tug or pull on the cable is transmitted to the lever causing it to further tighten the grip of the jaw members on the rail head. When the locomotive returns the cable is reeled in and the engineer in lifting the lever retracts the jaws permitting the rail clamp to be removed from the rail head without dismounting from the seat on the mine locomotive. Thus the slope of the gripping faces on the jaw members and the inclination of the lever when the jaw members are tightly clamped permit quick manipulation of

the rail head clamp and provide a positive low resistance contact for the return rail circuit. The constant load created by the pull or drag on the cable maintains the jaw members tightly clamped on the rail head. The bolt 20 maintains the jaw members in proper alignment and the stop pin 40 maintains the selected setting or gauge of the jaw members for a particular rail head size.

I claim:

1. A rail clamp for attaching an electric return circuit cable to the head of a rail comprising a screw shaft provided at its opposite extremities with a right hand thread and a left hand thread respectively, a pair of rail head-gripping jaws having aligned holes provided respectively with a right hand thread and a left hand thread which are engaged by the corresponding threads of the screw shaft, opposed shoulders on the jaws arranged to engage the top of the rail head and limit the downward movement of the jaws, said jaws having opposed gripping surfaces which converge downwardly and engage the lower edges of the rail head when the jaws are caused to converge, means for rotating the screw shaft to cause the jaws to grip the rail head or to release the jaws from the rail head, and means for electrically connecting an electric cable to said last mentioned means whereby the pull of the cable tightens the clamp on the rail head.

2. A rail clamp for attaching an electric return circuit cable to the head of a rail comprising a screw shaft provided at its opposite extremities with a right hand thread and a left hand thread respectively, a pair of rail head-gripping jaws having aligned holes provided respectively with a right hand thread and a left hand thread which are engaged by the corresponding threads of the screw shaft, opposed shoulders on the jaws arranged to engage the top of the rail head and limit the downward movement of the jaws, said jaws having opposed gripping surfaces which converge downwardly and engage the lower edges of the rail head when the jaws are caused to converge, means for rotating the screw shaft to cause the jaws to grip the rail head and to release the jaws from the rail head, means for electrically connecting an electric cable to said last mentioned means whereby the pull of the cable tightens the clamp on the rail head, and means for preventing misalignment of the jaws in a plane normal to the axis of the screw shaft.

3. A rail clamp for attaching an electric return circuit cable to the head of a rail comprising a screw shaft provided at its opposite extremities with a right hand thread and a left hand thread respectively, a pair of rail head-gripping jaws having aligned holes provided respectively with a right hand thread and a left hand thread which are engaged with the corresponding threads of the screw shaft, opposed shoulders on the jaws arranged to engage the top of the rail head to limit the downward movement of the jaws, said jaws being provided with opposed gripping surfaces which converge downwardly and engage the lower edges of the rail head when the jaws are caused to converge, a lever mounted on an end of the screw shaft for rotating the latter, means for electrically connecting an electric cable to said lever whereby the pull of the cable tightens the clamp on the rail head, and means for varying the angular relation of the lever to the screw shaft whereby the engineer of a mining locomotive may attach

the clamp to the rail head without dismounting.

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