July 6, 1948. A. H. GENTER 2,444,599

RAIL FLANGE CLAMP

Filed Oct. 4, 1944

Fig. 1.

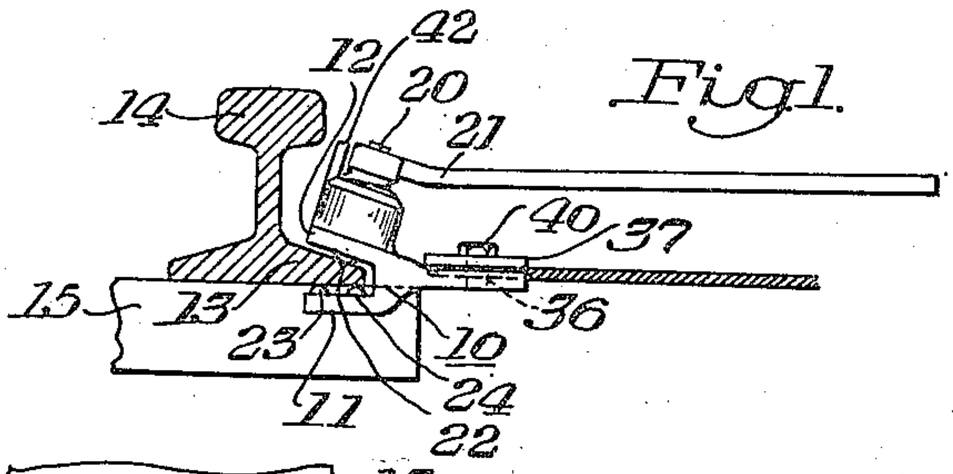



Fig. 5.

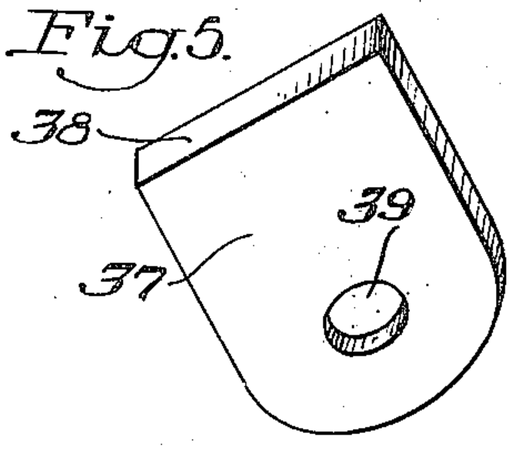



Fig. 2.

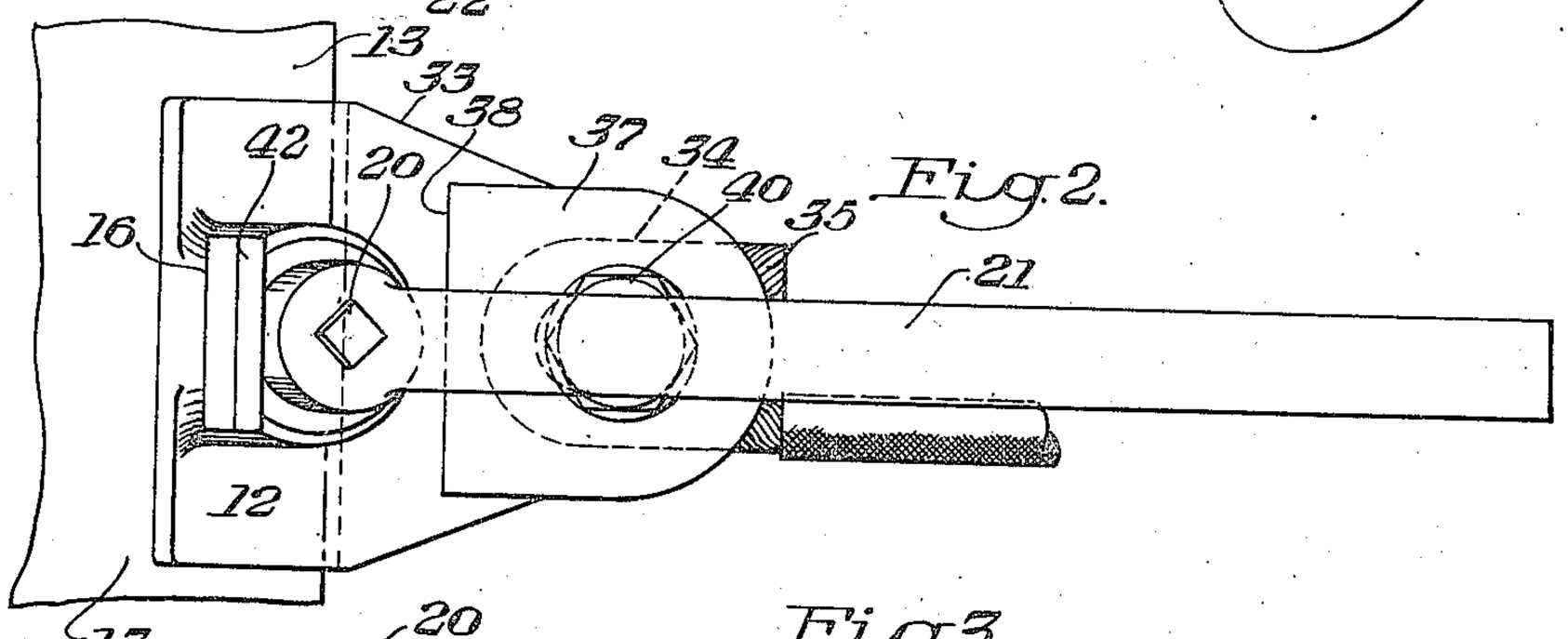



Fig. 3.

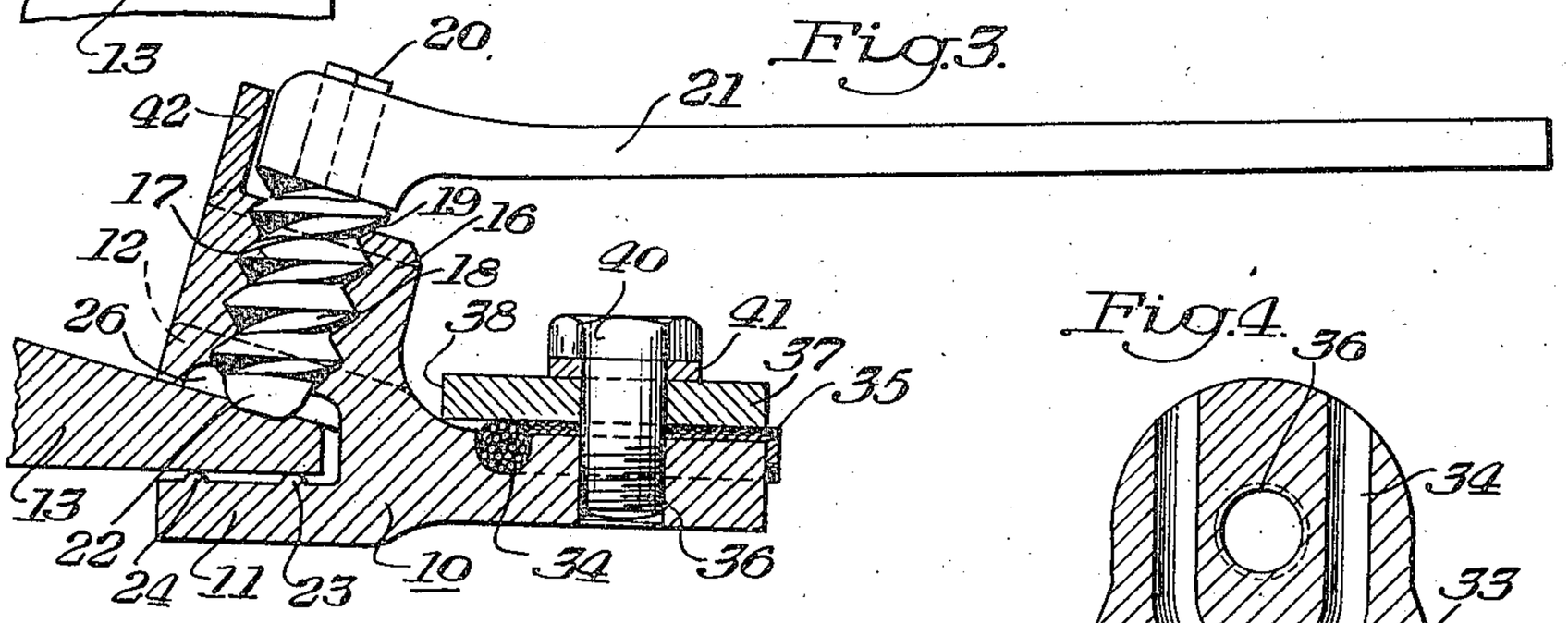



Fig. 4.

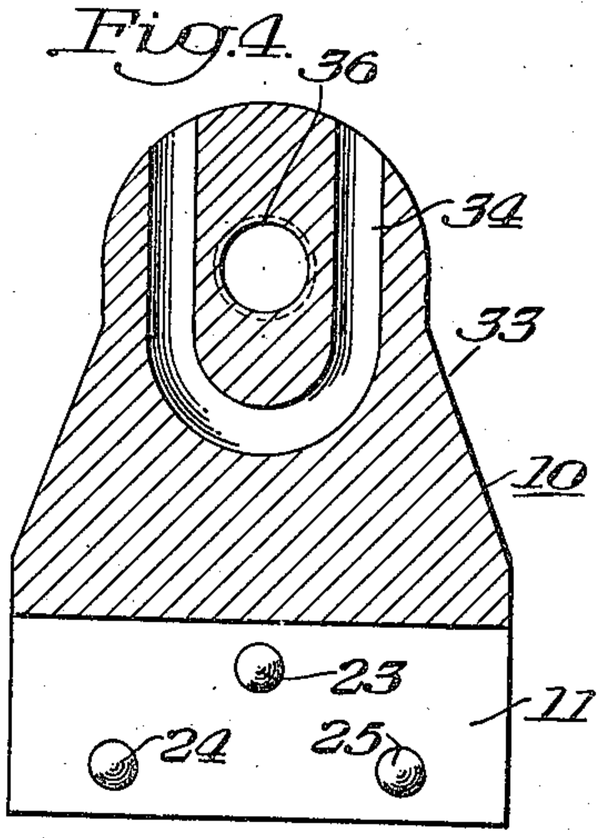



Fig. 6.

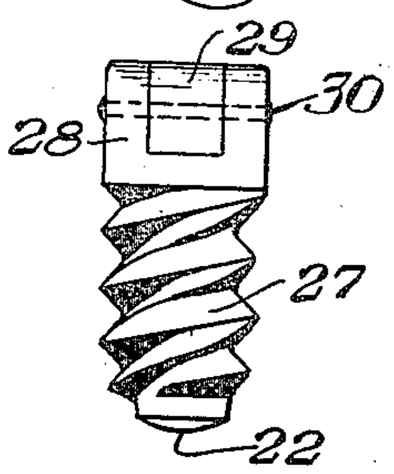
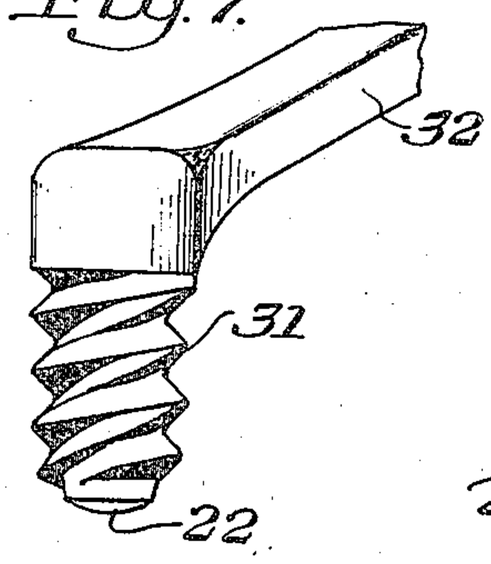



Fig. 7.

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# UNITED STATES PATENT OFFICE

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## RAIL FLANGE CLAMP

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1 Claim. (Cl. 173—273)

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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 flange of a rail.

Mining machinery working at the face of the mine remote of the main haul, in which the feeder circuits, trolley wire and rail return circuit are permanent, must have some means of conducting power from the main haul to the face. This is usually accomplished by means of cables carried by the mining machinery on drums or reels. The free end of the power cable is provided with a feeder tap while the free end of the return circuit cable is connected to a clamp arranged to be attached to the rail. As the machines move about in the room or at the face the cables are reeled out and in accordingly. Some mining equipment travel on pneumatic tires which necessitates the use of cables to provide them with power.

The principal object of this invention is the provision of a return rail clamp that may be quickly attached and detached to the flange of a rail.

Another object is the provision of a return rail clamp that has a positive three-point contact with the flange of a rail.

Another object is the provision of a return rail clamp having low resistance contact between the rail and the cable.

Another object is the provision of a return rail clamp that is readily adjustable to fit the flanges of different sizes of rails.

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:

Fig. 1 is a reduced side elevational view showing the return rail clamp connecting a cable with the flange of a rail.

Fig. 2 is a top plan view of the return rail clamp.

Fig. 3 is a vertical sectional view of the return rail clamp.

Fig. 4 is a horizontal sectional view of the return rail clamp.

Fig. 5 is a perspective view of the cable clamping plate.

Fig. 6 is a front elevational view of a handle hinged to the set screw.

Fig. 7 is a front elevational view of an integral handle and set screw.

Referring to the drawings, the return rail clamp body 10 is provided with a horizontally disposed lower jaw 11 and an upper diverging jaw 12 forming a V-shaped slot arranged to fit the flange 13 of the rail 14 between spaced ties 15. The angle between the jaws is approximately fifteen degrees which is substantially the degree of slope of the top surface of the rail flange. The flange varies in thickness in accordance with the weight of the rail but the slope of the top flange surface remains substantially the same.

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An upwardly extending boss 16 is cast integral with and normal to the top of the upper jaw 12 and is provided with a screw threaded socket or hole 17 the axis of which is disposed normal to the upper surface of the rail flange. A cast set screw 18 is provided with a mating thread 19 and a square shank 20 at the top thereof and is arranged to receive the mating socket in the head of the wrench 21. This shank is preferably tapered axially to provide a tight engagement between the wrench handle and the screw. The inner end of the screw 18 is provided with a hard metal ball tip 22 made of any suitable material such as hard carbide. The ball tip 22 is arranged to engage and bite into the top rail flange surface when the handle of the wrench 21 is turned and make a low resistance contact with the rail.

The inner surface of the bottom jaw 11 is provided with three semispherical lugs 23, 24 and 25 disposed in triangular spaced relation with each other. The lug 23 is adjacent the bottom at the center of the groove and the other lugs 24 and 25 are positioned on either side of the lug 23 adjacent the outer edge of the jaw 11 as shown in Fig. 4. The tip 22 of the set screw 18 is disposed substantially midway between the three lugs. When the clamp is placed on the rail the three lugs 23, 24 and 25 engage the under side of the flange 13 and provide a firm seating engagement while the tip 22 of the screw contacts the top of the flange in the center of the triangular arrangement of the lugs. When the screw 18 is firmly seated the tip 22 and the lugs 23, 24 and 25 bite into the rail flange 13 and provide a low resistance contact.

The pitch of the threads of the screw 18 is chosen so that the tip 22 bites into the rail flange when the lever handle 21 is swung in an arc less than 180°. If the handle 21 is moved counterclockwise in Fig. 2 until it is substantially parallel with the rail the tip 22 of the screw will be withdrawn into the cavity 26 out of contact with the rail flange 13. If the rail employed is a sixty pound rail the tip 22 of the screw 18 will make a tight engagement when the handle 21 is moved clockwise through 90°. If the rail employed is a twenty-five pound rail the clamp will be tight

when the handle is moved clockwise through 135° from its parallel position. Thus the pitch of the screw 18 is selected to provide clamping pressure within a 180° swing of the handle 21.

Quarter turn adjustment of the screw 18 may be made by removing the socket of the handle 21 from the square shank 20 and replacing it at a quarter of a turn in either direction to permit the clamp to be secured to a smaller or larger rail flange as the case may be.

A half turn adjustment may be obtained by using the screw 27 shown in Fig. 6 which is provided with a bifurcated head 28 arranged to receive the end of the handle 29. A pivot pin 30 is secured to the bifurcated portion of the screw head and passes through the end of the handle 29 to permit the latter to be flopped vertically from one side to the other, thus providing a half turn adjustment of the tip 22 relative to the rail flange. The sides of the bifurcated head 28 are engaged by the sides of the handle to transmit the force from the handle to the screw.

The screw 31 and the handle 32 shown in Fig. 7 are cast integral with each other. This form of screw would be employed where the rail sizes are practically all the same or within the adjustment of a 180° swing of the handle and the position of the latter relative to the screw is determined when the casting is made to accommodate a predetermined series of rail sizes.

The return to rail clamp 10 is provided with a rearwardly projecting flange 33 having a U-shaped groove 34 in the upper face thereof which is arranged to receive the bared cable conductor 35. A vertically disposed threaded hole 36 is formed through the flange 33 in the center of the U-shaped groove. A cable clamping plate 37 having at least one square end 38 and a clearance hole 39, which may be aligned with the threaded hole 36 to receive the bolt 40, is provided to secure the cable 35 to the rail clamp 10. The bolt 40 is provided with the lock washer 41 to prevent the bolt from becoming loose. The square end 38 of the plate engages the body of the clamp to prevent the plate from turning.

The casting of the rail flange clamps that employ the wrench handle 21 or the flop handle 29 shown in Figs. 3 and 6 respectively may be provided with the upwardly extending stop abutment 42 which is disposed parallel with the jaws and the rail. The ends of this abutment prevent the lever from traveling beyond the edge of the jaws of the clamp thus limiting the rotation of the levers in their operating position. The lever handle 21 may be removed from the set screw and the latter adjusted to engage a rail flange of predetermined size. The lever handle may then be replaced and the setting will thus be maintained regardless of the number of times it is removed or applied to the same size rail flange without further adjustment. The flop lever 29 may be held vertically and the set screw adjusted to properly engage a selected rail flange. The lever is then forced down into operating position and may also be repeatedly applied and removed from rail flanges of the same size without altering the adjustment. Thus when either of these rail clamps are properly set they may be applied indiscriminately.



I claim:

A rail flange clamp for attaching an electric return circuit cable to the flange of a rail consisting of, a body having integral upper and lower diverging jaw members arranged to receive a rail flange therebetween, connecting means for electrically connecting an electric cable to the body, a threaded opening through the upper jaw member with its axis disposed substantially normal to the flange engaging surface of said jaw member, a complementary screw for said threaded opening arranged to engage the top of a rail flange for the purpose of fixing the clamp thereto, and three lugs on the flange engaging surface of the lower jaw member disposed in spaced triangular arrangement about the axis of the screw with two lugs positioned in alignment and adjacent the outer edge of the lower jaw member, whereby the clamping force of the screw reacts with the rail flange and said lugs to prevent the clamp from backing off the flange.

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