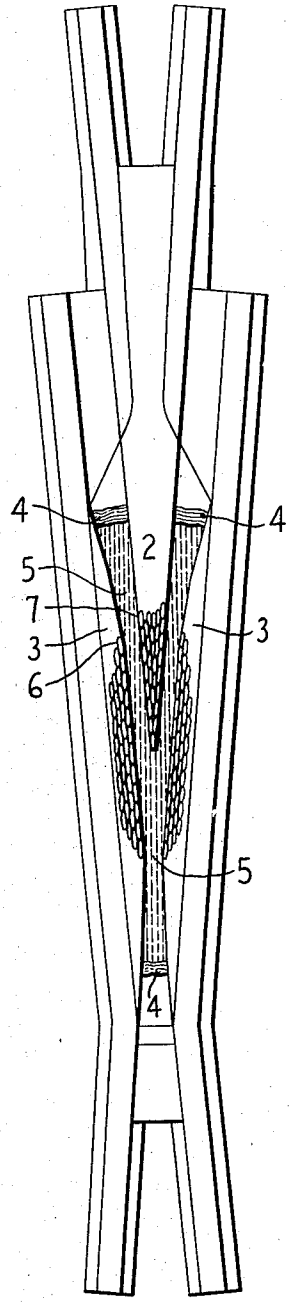
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BUILDING UP WORN TRACK MEMBERS

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BUILDING UP WORN TRACK MEMBERS

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The invention relates to building up worn track members by welding on melted metal, by means of the oxyacetylene flame and welding rod. The particular practical problem is the building up of cast manganese steel frogs or inserts of rail-bound frogs. The tongue and wing portions of these inserts are subect to wear, the castings are expensive, and their duty is extremely important. It has been difficult to build them up. It may have been accomplished with more or less success by electric welding, but as far as I am aware it has not been possible heretofore to effect the restoration by the cheaper and more convenient oxyacetylene process, though attempts have long been made to do so. When it has been tried, the casting has cracked or pieces of the metal have broken off. The composition of these high manganese steel track members makes them very susceptible to intense heating and to consequent contraction strains.

I have succeeded in building up such members, in place in the track, using the oxyacetylene torch, without injury to the castings. One thing that I have found important is to dam up the flange-ways of the frog and to fill them with water up to within about one-half inch of the top of the casting.

Another important matter is the way in which the added metal is welded on. I apply it in small elongated beads, preferably about one-half inch wide and two inches long, hammering each bead vigorously as soon as the torch is removed and until the bead has cooled down to about 400° F., after which another bead is added and hammered, and so on until the worn area has been built up to the desired level. The beads are applied lengthwise of the member. Best results are obtained by applying a series of the longitudinal beads along the edge of the member, then applying a second series adjoining the first, and continuing with as many series successively farther removed from the edge as are necessary. However, this procedure is susceptible of modification.

The process is applicable to the building up of railroad track members generally, but is special field is the restoration of members, such as frogs and crossings, the composition of which is such that building them up with the oxyacetylene flame in the ordinary way is likely to cause cracking or breaking of the original metal.

The accompanying drawing is a plan view of a manganese insert frog showing dams retaining a body of water in the flange-ways, and indicating somewhat schematically rows of the elongated beads covering the areas to be built up. It will be understood that the drawing does not show a true appearance since the hammering of the beads causes them to merge into a continuous surface.

The insert of the frog includes the tongue 2 and the wing-rail portions 3. The surfaces of the point of the tongue and of the wing-rail portions are subject to severe wear. Before building up such worn regions I place clay dams 4 across the flange-ways up to within about one-half inch of the top of the casting, and fill the included space, up to this level with water. The body of water in the flange-ways, which is marked 5, preferably extends beyond the regions to be treated, so that there is enough water to keep the casting sufficiently cool. The casting is then warmed up in the area adjacent to where the weld is to be started.

For the purpose of a concrete example of the carrying out of the process as applied to building up a wing-rail portion, let it be assumed that one end of the wear at the inside edge is at the point 6. A small elongated bead is welded on at this point, parallel with the edge, by adding metal melted from a welding rod of composition appropriate for welding onto the steel of the casting by the oxyacetylene flame. The surface of the bead is made as smooth as possible, the torch is removed and immediately the bead is hammered vigorously until it has cooled down, as stated, to about 400° F. Then another similar bead or deposit is welded on adjoining and in line with the first bead, and is hammered in the same way. This process is repeated until there is a bead about one-half inch wide welded on along the flange side of the surface of the wing-rail portion as far as the casting is worn. Another bead is started back alongside of the first bead and is hammered, and successive small deposits are similarly put on and hammered until the farther end of the worn region is again reached. As many series of beads or individual deposits are put on as are required, and if necessary a second layer may be applied on top of the first to bring the general surface up to the proper level.

The point of the frog is built up in much the same manner. Starting at the spot 7, for example, on the outside edge, one of the beads is put on and hammered, and other beads are added successively until the extreme point is reached. I then preferably lay a bead along the other outside edge, proceeding toward the extreme point as before, and after these outside beads are on I build up the included area in the same general way.

When the operation is otherwise finished, any overhanging metal can be trimmed off by heating a small portion at a time and cutting with a cold chisel while the metal is hot.

The purpose of applying the metal in small beads is to localize the heat as much as possible and to avoid checking and cracking of the casting. The hammering of the individual deposits while cooling tends to stretch the added metal and thereby to prevent cracking. I have discovered that if these beads or deposits are added one after another, with intermediate hammering, so as to form a continuous series extending lengthwise of the track member, and if these operations are repeated in the addition of another longitudinal line of deposits, and so on, until the entire worn area is built up, the failures which have hitherto attended attempts to restore worn cast manganese steel track members by means of the oxyacetylene flame and a welding rod can be avoided. Furthermore, I have ascertained that it is very desirable to add metal in this manner first along the edge. This edge metal seems to act more or less as a binder or reinforcement which tends to prevent checking. Building up the edge before the metal gets too hot as the result of adding metal farther in on the surface of the track member overcomes much of the usual difficulty. The cooling effect of the body of water in contact with the track member also contributes to the success of the operation.

I claim:

1. The method of building up worn railroad track members high in manganese, which comprises welding on the worn surfaces of such members small deposits of metal by means of the oxyacetylene flame and welding rod, and hammering each deposit, a row of deposits being applied in this manner first along the edge of the member as far as the wear extends, after which another row of small deposits is applied alongside and inward of the first row, with hammering of each deposit as before, these operations being repeated in as many longitudinal rows of deposits as are necessary to cover the worn area.

2. The method of building up worn railroad track members high in manganese, which comprises welding on the worn surfaces of such members small elongated beads by means of the oxyacetylene flame and welding rod, intermediately hammering each bead, the beads being applied in series extending lengthwise of the track member.

3. The method of building up worn railroad track members high in manganese which comprises confining a body of water in contact with the parts to be built up, and welding on the worn surfaces thereof, by means of the oxyacetylene flame and welding rod, a series of small elongated beads, intermediately hammering each bead, the beads being applied lengthwise of the track member.

4. The method of building up worn railroad track members high in manganese, which comprises confining a body of water in contact with the parts to be built up, welding lengthwise on the worn surfaces, by means of the oxyacetylene flame and welding rod, successive additions of metal, and hammering each addition.

5. The method of building up worn railroad frogs high in manganese, which method consists in placing dams across the flange-ways beyond both ends of the section to be built up, partially filling the flange-ways between the dams with water, heating a portion of the frog, welding a small elongated deposit of metal to the heated portion, hammering the deposit while it cools below a given temperature, welding a second small elongated deposit adjoining and in line with the first deposit, hammering the second deposit in the same manner as the first deposit, similarly welding and hammering a series of deposits to form a bead extending along one edge and throughout the entire length of the worn portion of the frog, and similarly welding parallel adjacent beads until the worn surface is built up.

6. A method of building up worn cast manganese steel railroad track members by welding on the worn tread surface fused metal in small deposits by means of the oxyacetylene flame, and hammering the deposits, a narrow reinforcement of metal being applied in this manner along the edge of the member before the interior area is built up.

7. A method of building up worn cast manganese steel railroad track members by welding on the worn tread surface fused metal in small deposits by means of the oxyacetylene flame, and hammering the deposits, a narrow reinforcement of metal being applied in this manner along the edge of the member before the interior area is built up, the building up of the interior area being likewise performed in narrow longitudinal courses.

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