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Welding machine and method for welding rails of a track

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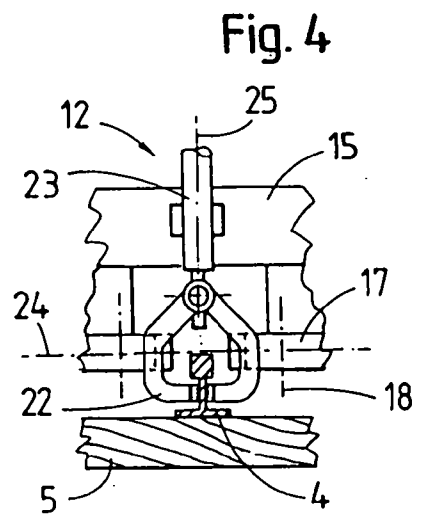
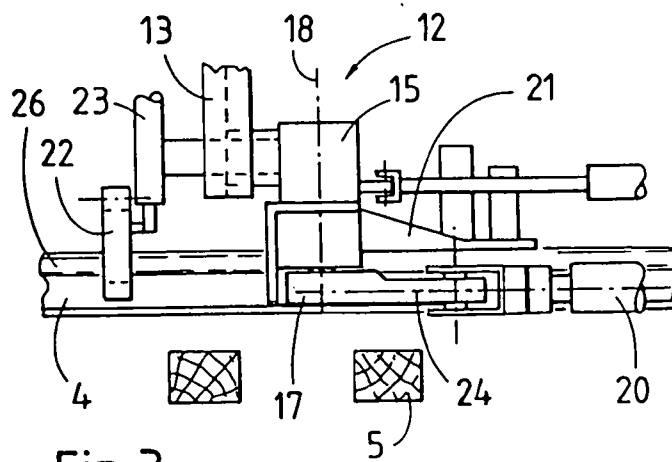
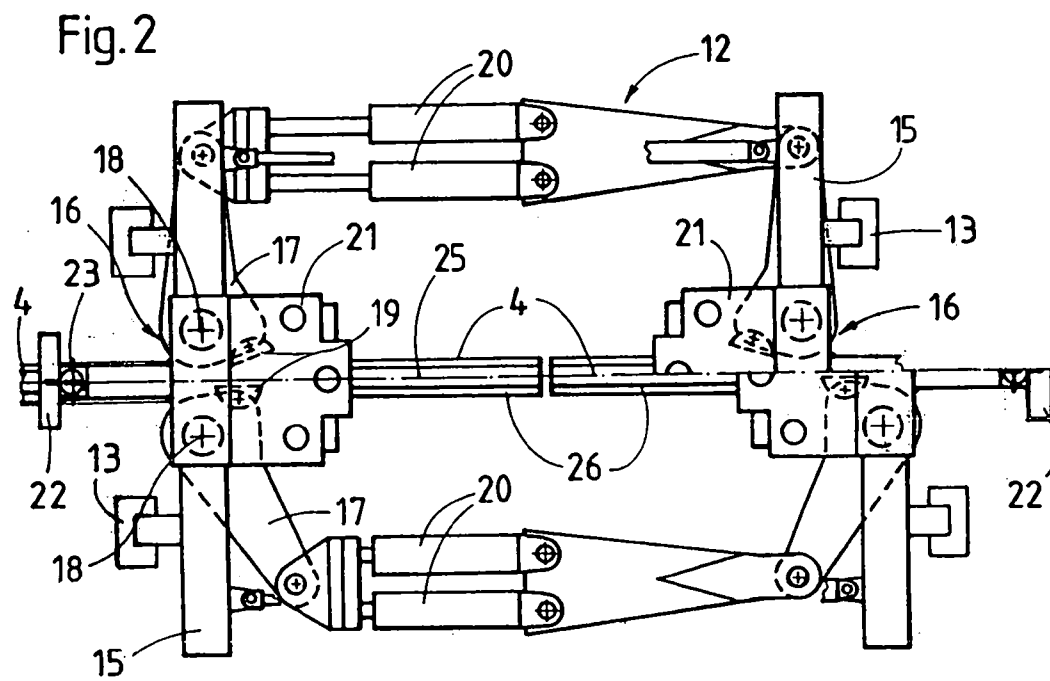
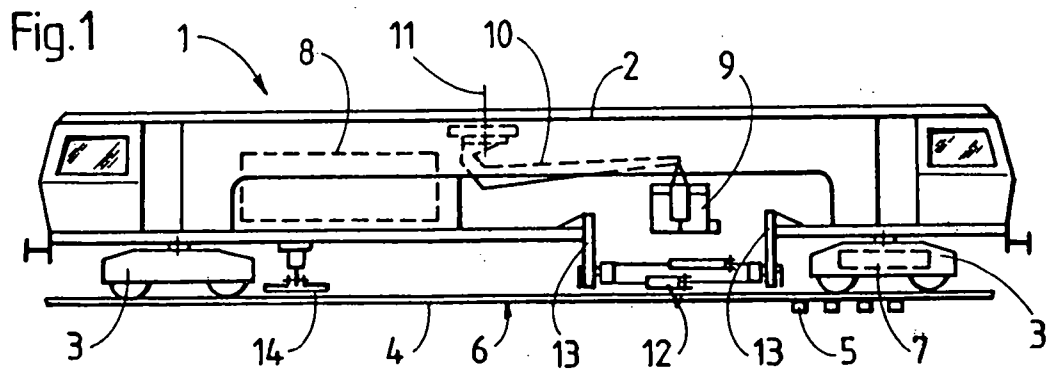
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(56) Related Art
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ABSTRACT

A welding machine comprises a rail pulling device (12) for gripping and pulling together the rails (4) to be welded to one another. Two rail clamps (22) provided for gripping the rails (4) are fastened to the rail pulling device (12). Said rail clamps (22) are each vertically adjustable by means of an adjustment drive (23) in their position relative to the rail pulling device (12) in a direction extending perpendicularly to a pulling device plane formed by hydraulic drives (20). With this, the rails (4) can be lifted from sleepers in a simple manner in order to be able to finally grip the rails (4) by means of the clamping members (17) of the rail pulling device (12).

(Fig. 2)



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WELDING MACHINE AND METHOD FOR WELDING RAILS OF A TRACK

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The following statement is a full description of this invention, including the best method of performing it known to applicant(s):

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WELDING MACHINE AND METHOD FOR WELDING RAILS OF A TRACK

- [0001] The invention relates to a welding machine according to the features cited in the introductory part of claim 1.
- [0002] A machine of this type is known from US 5 136 140, EP 0 326 794 or US 4 929 816 and serves for welding rails of a track. The welding operation is assisted by a rail pulling device which pulls the clamped rail ends towards one another with great force to a distance required for the welding. The rail pulling device is suspended pendulum-like on the machine frame and is vertically adjustable for being lowered onto the rails for working operations. In order to be able to grip the rails, these must first be lifted from the base plates by driving wedges between the latter and the rail base in a laborious manner.
- [0003] It is the object of the present invention to provide a machine of the kind mentioned at the beginning with which the rails can be gripped by the rail pulling device in a simplified manner.
- [0004] This object of the invention is achieved with a machine of the specified kind by the features cited in the characterizing part of the main claim.
- [0005] With these auxiliary clamps, it is possible with merely small additional structural expense to quickly grip and lift the rail ends to be welded to one another. Since the rail pulling device has to be centered above the rails in any case, doing so in an advantageous way causes the clamps fastened to the rail pulling device to be automatically centered with respect to the rails to be gripped. As a result, a very quick, precise and automatically executable gripping of the rails is assured. Furthermore, the subsequently required gripping of the rails by a centering device, integrated into the rail pulling device, can be carried out entirely without problems and automatically.
- [0006] A further object of the present invention is also to create a method of the type described in the introductory part of claim 5, which enables the rail pulling device to more easily grip the rails to be welded.
- [0007] This further object of the invention is achieved by the features cited in the characterizing part of claim 5.

- [0008] Additional advantages of the invention become apparent from the description of the drawing. The invention will be described in more detail below with reference to an embodiment represented in the drawing in which
- [0009] Fig 1 shows a side view of a welding machine including a rail pulling device,
- [0010] Fig. 2 shows an enlarged top view of the rail pulling device,
- [0011] Figs. 3, 4 show a partial side view and a view in the longitudinal direction of the rails, respectively, of the rail pulling device.
- [0012] A welding machine 1, shown in Fig. 1, has a bridge-like machine frame 2 and, with the aid of a motive drive 7, is mobile via on-track undercarriages 3, arranged at the ends, on a track 6 comprising rails 4 and sleepers 5. A central power plant 8 including a drive motor, hydraulic pumps and a generator delivers the required energy. Arranged centrally between the two undercarriages 3 is an electric flash-butt welding unit 9 connected to a telescopically extendable and vertically adjustable boom 10 which, in turn, is fastened to the machine frame 2 and rotatable about a vertical axis 11. Arranged underneath the flash-butt welding unit 9 is a rail pulling device 12 which is mounted in guides 13 connected to the machine frame 2. Situated in the region of one of the two undercarriages 3 are two lifting jacks 14, spaced from one another in the transverse direction of the machine, which are designed for being placed on the upper sleeper surface, thus lifting the machine frame 2.
- [0013] The rail pulling device 12, shown on a larger scale in Fig. 2, for longitudinal displacement of the rails 4 consists of two transverse beams 15, spaced from one another and extending transversely to the longitudinal direction of the machine or the rails. Arranged on said transverse beams 15 are clamping members 17, forming a respective clamping member pair 16, which are connected in each case to the transverse beam 15 for pivoting about a pivot axis 18 extending vertically or perpendicularly to the track plane. The two clamping members 17 depicted in the upper part of the drawing are shown in the opened position, while the lower clamping members 17 are shown in the closed position. Each clamping member 17, having pivotable clamping jaws 19 for application to the rail web, is

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articulatedly connected in the end region opposite the pivot axis 18 to two hydraulic drives 20. On the side facing one another, the transverse beams 15 are connected in each case to a centering device 21 by means of which the rails 4 can be centered for the welding operation (the centering device 21 is described in more detail in US 5 136 140).

- [0014] Fastened to each transverse beam 15 is a rail clamp 22 provided for gripping the rail 4 situated thereunder. Said rail clamp 22 is vertically adjustable in each case by means of an adjustment drive 23 with regard to its position relative to the transverse beam 15 – in a direction extending perpendicularly to a pulling device plane 24 (Fig. 3) formed by the hydraulic drives 20. Each rail clamp 22 is arranged symmetrically with respect to a plane of symmetry 25 which is positioned perpendicularly to the pulling device plane 24 and centrally between the pivot axes 18 of each clamping member pair 16.
- [0015] According to the depiction shown in Figs. 3 and 4, the rail pulling device 12 is in a working position spaced from the sleepers 5. The two rail clamps 22 have been lowered relative to the rail pulling device 12 with actuation of the adjustment drive 23 in order to grip both rail ends 26 of the rail 4 (Fig. 4) and lift the same to the level of the pulling device plane 24 defined by the position of the clamping members 17 (Fig. 3). With this, the two rail ends 26 come to lie between the clamping members 17 and are clamped firmly between the same with the aid of the hydraulic drives 20. Thereafter, the rail clamps 22 are detached from the rail ends 26.
- [0016] In further sequence, the two rail ends 26 are pulled towards one another by means of the hydraulic drives 20 to a distance required for welding, and are welded to one another by means of the welding unit 9.
- [0017] As an alternative to the embodiment shown, it would also be possible to arrange the rail clamps 22 directly on the guides 13.

The claims defining the invention are as follows:

1. A welding machine for welding rails of a track, including a welding unit, a machine frame mobile on on-track undercarriages, and a rail pulling device for gripping rail ends to be welded to one another, including
5 pivotably mounted clamping members, forming respective pairs spaced from one another in the longitudinal direction of the rails, having clamping jaws provided for application to the rail, wherein the two clamping member pairs, having pivot axes extending parallel to one another, are connected to one another by means of hydraulic drives, and the rail pulling device is
10 fastened for vertical adjustment to the machine frame, **characterized in that** two rail clamps, each of which is vertically adjustable by means of an adjustment drive independently of and relative to the rail pulling device, are provided for gripping and lifting the rail ends from the sleepers.
2. A welding machine according to claim 1, characterized in that a rail
15 clamp is fastened in each case to a transverse beam of the rail pulling device, the rail clamp being adjustable in each case by means of an adjustment drive in its position relative to the transverse beam in a direction extending in a pulling device plane formed by the position of the clamping members.
- 20 3. A welding machine according to claim 2, characterized in that each rail clamp is arranged symmetrically with respect to a plane of symmetry extending perpendicularly to the pulling device plane and centrally between the pivot axes of each clamping member pair.
4. A welding machine according to any one of claims 1, 2 or 3,
25 characterized in that an upper end position of the rail clamps is delimited by the pulling device plane
5. A method of welding rails of a track, wherein the rail ends to be welded to one another are lifted from sleepers, gripped by clamping members of a rail pulling device, pulled towards one another, and welded,
30 **characterized by the following features:**
 - a) the rail ends resting on sleepers are gripped by rail clamps which are vertically adjustable relative to the rail pulling device and, with distancing vertically from the sleepers, are delivered to the clamping members of the rail pulling device,

b) as soon as the rail ends come to lie between the clamping members, the two rail ends are clamped firmly by the clamping members, and the rail clamps are opened.

5 6. A welding machine for welding rails of a track, substantially as hereinbefore described with reference to any one of the embodiments shown in the accompanying drawings.

7. A method of welding rails of a track, substantially as hereinbefore described with reference to any one of the embodiments shown in the accompanying drawings.

