

[54] **MOVABLE CABLE- AND CONDUCTOR INFEEED ARRANGEMENT FOR TRANSPORT- AND CHANGE WAGONS POSSESSING LIMITED MOBILITY WITH THE HALLS OF STEEL WORKS**

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[51] **Int. Cl.**..... **H02g 11/02**

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[57] **ABSTRACT**

A movable line infeed arrangement, especially cable- and conductor infeed arrangement for transport- and change wagons or carriages which are movable within limited paths of travel in the halls of steel works, and which wagons are especially suitable for the handling of the casting vessels of continuous casting installations, wherein the cable or conductors are secured to a metallic band anchored at the wagon. This metallic band is guided overhead to a deflecting roller arranged at the end of the path of travel of the carriage or wagon and from such location is guided about a loose tensioning roll and then leads to a stationary connection location which is located approximately in the direction of the deflecting roller.

7 Claims, 3 Drawing Figures

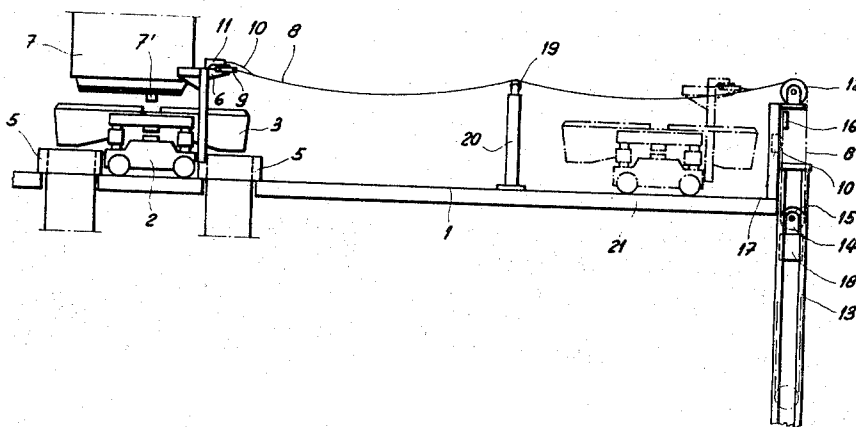


Fig. 1

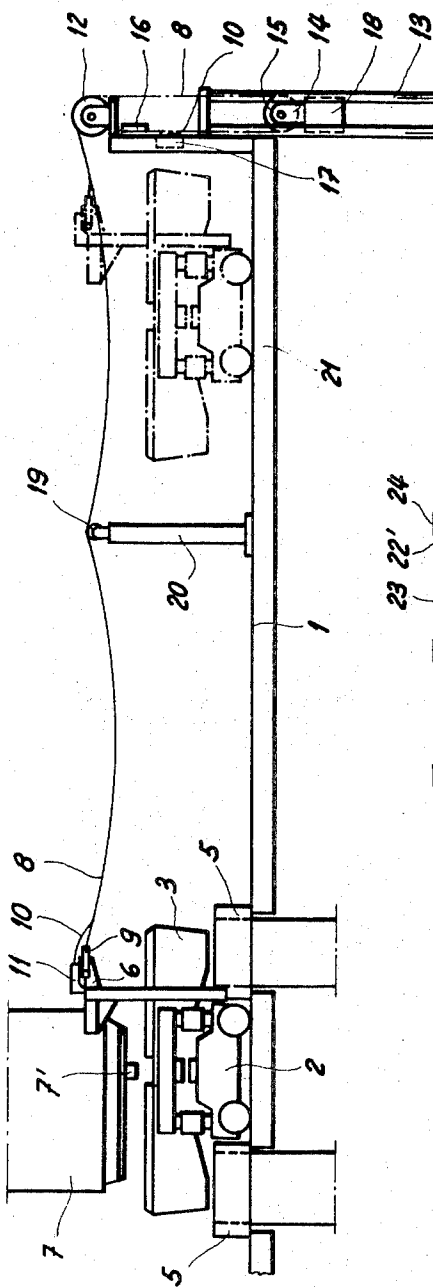


Fig. 3

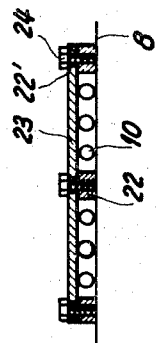
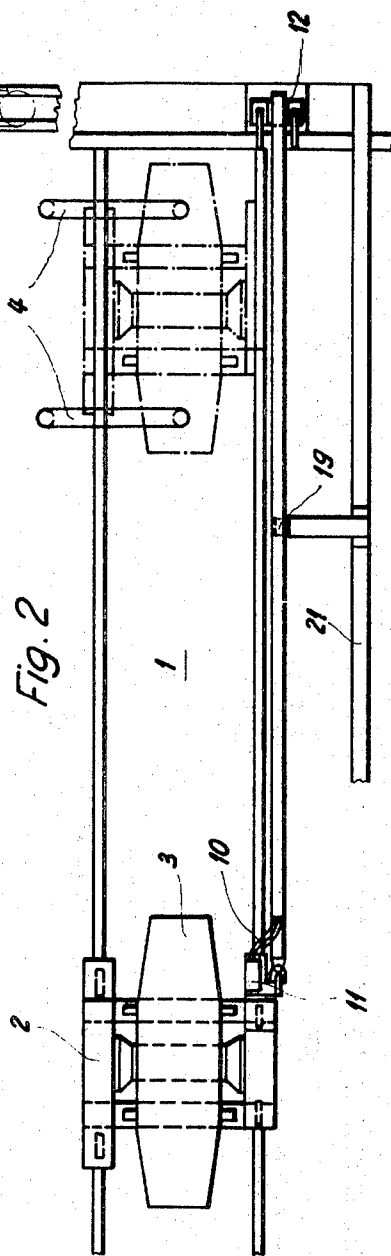


Fig. 2



**MOVABLE CABLE- AND CONDUCTOR INFEED
ARRANGEMENT FOR TRANSPORT- AND
CHANGE WAGONS POSSESSING LIMITED
MOBILITY WITH THE HALLS OF STEEL WORKS**

BACKGROUND OF THE INVENTION

The present invention relates to a new and improved construction of line infeed arrangement, especially cable- and conductor infeed arrangement for transport- and change carriages or wagons, especially for casting vessels, and which carriages are mobile along limited paths of travel within the halls of steel works.

Such type carriages or wagons are employed, for instance, at the casting platform of continuous casting plants or installations for the transport of casting ladles and tundishes between a change- or heating station and the continuous casting mold.

The use of a movable cable which deposits itself during travel upon the casting platform and serving to supply the current to a tundish carriage or wagon is already known in the art. With this construction of equipment the cable is endangered by slag or metal spray. Additionally, the cable itself impairs the path of travel at the casting platform and constitutes an additional safety risk for the operating personnel, especially during hazardous situations.

There is also known to the art another proposal, likewise not capable of fulfilling the safety requirements, wherein the current is removed from loop or two-wire conductors arranged beneath the casting platform through a slot along the path of travel at the casting platform. Moreover, this proposal is not suitable for the transmission of measurement- and control signals without arranging an amplifier at the carriage or wagon. The same drawback equally exists when using cable drums.

Finally, there is also known to the art a current infeed arrangement which contemplates using a movable cable suspended at a rail. However, this solution has not been generally received with great favor by the operators of continuous casting installations since the rails continuously hinder the mobility of the crane.

SUMMARY OF THE INVENTION

Hence, it is a primary object of the present invention to provide a relatively simple, operationally reliable cable- and conductor infeed arrangement for transport- and change carriages which are limited in their mobility within the halls of steel works, especially carriages used for the handling of casting ladles and tundishes of continuous casting installations.

Another object of this invention relates to a new and improved construction of mobile line infeed arrangement, especially a cable- and conductor infeed arrangement for traveling transport- and change carriages wherein the transport area about the continuous casting mold is limited only to a minimum degree.

Yet a further significant object of the present invention aims at the provision of a new and improved construction of cable and conductor infeed arrangement which is capable of completely protecting the cable or conductors from contact with melt- and slag spray.

Now in order to implement these and still further objects of the invention, which will become more readily apparent as the description proceeds, the line, in other words the cables or conductors are secured to a metallic band anchored at the carriage. This metallic band

extends overhead to a deflecting roller arranged at one end of the path of travel and from such location extends about a loose tensioning roller and from there to a stationary connection location which is disposed approximately in the direction of the deflecting roller.

With this relatively simple cable- and hose infeed arrangement the casting platform is maintained completely free. Further, the cables or the like are protected against melt- and slag spray. After removing the carriage from the mold the entire region of travel is also accessible for the movement of the crane. The metallic band can be prepared together with the cables and conductors in the factory in the form of a mountable unit which can be completely exchanged.

There is already known to the art a cable guide arrangement for the trolley or traveling crab of a crane in which the cables are mounted upon a metallic band in the manner of a cable drag chain and which is deposited upon the path of travel in a loop-like fashion. This type of equipment, however, is not capable of being successfully employed in a continuous casting installation because the band constitutes a hindrance and the cable cannot be sufficiently protected.

According to a further constructional manifestation of the invention the tensioning roller is mounted beneath the deflecting roller upon which a weighted console or bracket which is accommodated in a vertical guide. In this manner the metallic band together with the cable is stored in a vertical loop so that the smallest possible space is occupied at the casting platform.

In the case of a tundish carriage there are advantageously also arranged upon the metallic band, apart from the current infeed cable for the propulsion drive, the conductors for the lifting- and weighing devices and the control for regulating the degree of filling. Likewise in the case of a ladle carriage there can be arranged upon the metallic band both the current infeed cable for the propulsion drive as well as also the conductors for a lifting- and weighing device. In this manner the required control- and regulating devices can be advantageously installed in the control room or area at a safe distance from the melt.

In the case of a tundish there can be realized a particularly good protection of the cables and conductors against radiation and spray if the connection location for the metallic band and the cables and conductors are provided above the ladle outlet or pour opening at a cantilever or overhang arm member arranged laterally at the carriage or wagon.

When working with relatively long paths of travel or displacement paths it can be advantageous to support the metallic band by means of a roller between the terminal positions of the carriage.

Furthermore, elastic shock absorbers or buffers possessing internal thread can be advantageously arranged upon the band member which is preferably formed of steel, and upon which buffers there can be fixedly threaded clamping brackets for fixedly clamping the cables and conductors or the like.

BRIEF DESCRIPTION OF THE DRAWING

The invention will be better understood and objects other than those set forth above, will become apparent when consideration is given to the following detailed description thereof. Such description makes reference to the annexed drawing wherein:

FIG. 1 schematically illustrates a line infeed arrangement, here shown for instance as a cable infeed arrangement for a tundish carriage which can travel along a casting platform;

FIG. 2 is a plan view of the arrangement depicted in FIG. 1; and

FIG. 3 is a sectional view through the metallic band and the cables as same are employed in the arrangement of FIGS. 1 and 2.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Describing now the drawing, it will be understood that a carriage or wagon 2, which may be a tundish or ladle carriage, can travel upon a casting platform 1 of a continuous casting installation. By means of the carriage 2 a casting vessel such as a tundish 3 can be transported between a heating station 4 and a casting position above a continuous casting mold 5.

Now at the tundish carriage 2 there is arranged a cantilever or overhang arm member 6 at which there is hingedly connected above the pouring outlet 7' of a ladle 7 a metallic band 8 through the agency of a suitable connection member 9. Upon the metallic band 8 there are mounted suitable lines, such as current infeed cables and measuring- and control conductors 10 which are connected at a terminal box 11 provided at the overhang arm member 6.

The metallic or metal band 8 is guided overhead to a deflecting roller or roll 12 mounted at the end of the path of travel of the tundish carriage or wagon 2 upon the casting platform 1. Beneath the deflecting roller 12 there is located a vertical guide 13 in which there can be displacably received a roller 15 mounted upon a console or bracket 14. The metallic band 8 travels in a downward direction from the location of the deflecting roller 12, about the movable roller 15 and again upwards to a connection location 16. For connecting the cables and conductors 10 there is also provided a terminal box 17. To realize sufficient tensioning of the metallic band 8 the console 14 is weighted by weights 18. A support 20 equipped with a roller 19 is provided for the metal band 8 between the terminal positions of the tundish carriage 2. This support 20 is detachably secured to the casting platform 2 at the region of a platform carrier or support 21.

Now when the tundish carriage 2 is located in casting position, then, the metallic band member 8 together with the cables and conductors 10 extends overhead to the deflecting roller 12. The casting platform 1 is freed for use by the operating personnel and for the fork lift transport. During return of the tundish carriage 2 towards the opposite end of the casting platform 1 the metallic band 8 is entrained and stored in the guide 13 while lowering the loose movable roller 15. Thereafter, the entire mold region is also free for carrying out work with the crane.

Elastic buffers or shock absorbers 22 having internal threading 22' are arranged upon the metallic band member 8 and upon which there are secured the clamping brackets 23 for fixedly clamping the cables and conductors 10 by means of screws 24 or equivalent

fastening devices.

Finally, it is to be mentioned that in the context of this disclosure the term "line" has been used in its broadest sense to denote cables, conductors, hoses and similar type components.

While there is shown and described present preferred embodiments of the invention, it is to be distinctly understood that the invention is not limited thereto, but may be otherwise variously embodied and practiced within the scope of the following claims. Accordingly,

What is claimed is:

1. A movable line infeed arrangement, especially a cable- and conductor infeed arrangement, for a transport- and change carriage which can travel over defined paths of travel for use in the halls of steel works, said carriage being employed in conjunction with the casting vessels of a continuous casting installation, comprising a metallic band upon which there can be secured the lines, means anchoring said metallic band at the carriage, a deflecting roller arranged at one end of the path of travel, a loose tensioning roller, said metallic band substantially freely extending overhead to the deflecting roller and being devoid of any overhead rail support extending along the path of travel, from that location being trained about said loose tensioning roller and then extending to a stationary connection location which is disposed approximately in the direction of the deflecting roller.

2. The line infeed arrangement as defined in claim 1, further including vertical guide means, a weighted console cooperating with said vertical guide means, said tensioning roller being located beneath said deflecting roller and mounted at said weighted console.

3. The line infeed arrangement as defined in claim 2, especially for a ladle carriage, wherein the lines guided at the metallic band define current infeed cable means for the propulsive drive as well as electrical and hydraulic lines for a lifting- and weighing device.

4. The line infeed arrangement as defined in claim 2, especially for a tundish carriage, wherein the lines guided at the metallic band define cables for the propulsive drive as well as the electric and hydraulic lines for a lifting- and weighing device and a control for regulating the degree of filling.

5. The line infeed arrangement as defined in claim 4, further including a ladle having an outlet, said anchoring means for the metallic band being provided above the ladle outlet and incorporates a lateral overhang arm member arranged at the carriage.

6. The line infeed arrangement as defined in claim 1, wherein the carriage is movable between terminal positions, and a roller member for supporting the metallic band between the terminal positions of the carriage.

7. The line infeed arrangement as defined in claim 1, wherein the metallic band constitutes a steel band, elastic buffer means having internal threading arranged upon the steel band, and clamping bracket means for the lines fixedly threadably connectable with the elastic buffer means.

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