Jan. 27, 1970 F. SÖFFGE 3,491,391

PREFABRICATED BRIDGE PLACING VEHICLE

Filed March 18, 1968 2 Sheets-Sheet 1

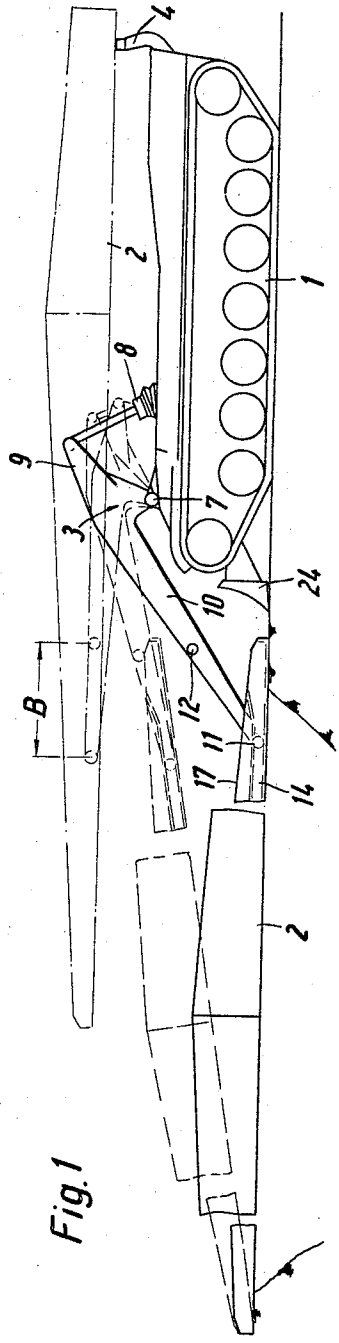

Fig. 1

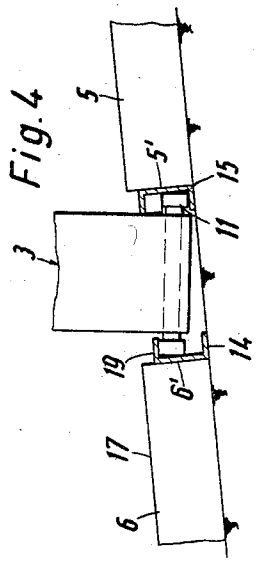

Fig. 4

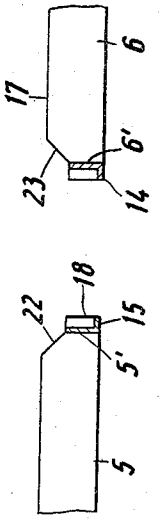

Fig. 5

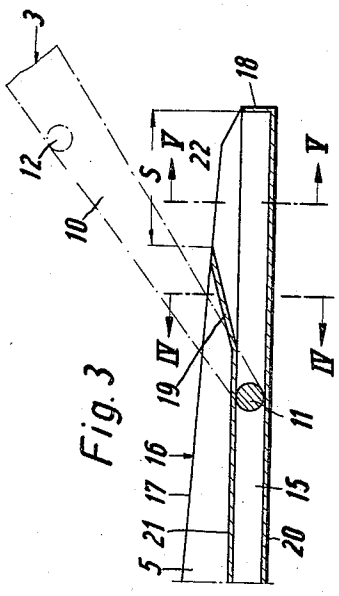

Fig. 3

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Jan. 27, 1970 F. SÖFFGE 3,491,391

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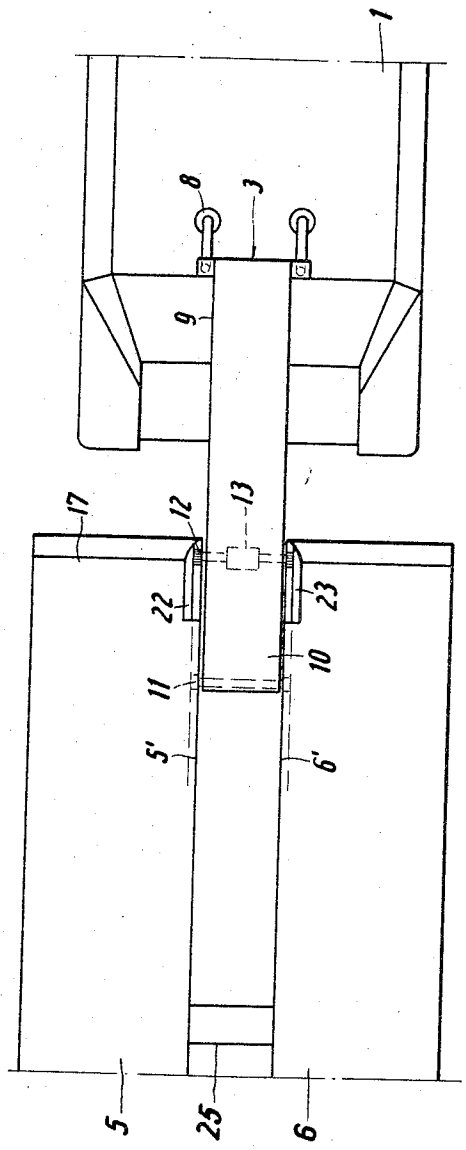
Filed March 18, 1968 2 Sheets-Sheet 2

Fig. 2



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PREFABRICATED BRIDGE PLACING VEHICLE

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ABSTRACT OF THE DISCLOSURE

A powered vehicle arrangement for placing a prefabricated bridge of the parallel roadway track type across a trench, wherein a pivoted boom supports the bridge for longitudinal movement relative to the vehicle by interengaged boom rollers and bridge support channels. The channels each have roller exiting recesses that are of less length than the roller longitudinal spacing with a stop at the rear of each recess, an upwardly diverging roller top engaging surface at the front of each recess, and side V-shaped recess surfaces for guiding the ingress and egress of the rollers with respect to the recesses.

BACKGROUND OF THE INVENTION

It is known to provide a motor vehicle with a device for transporting and placing of bridges, especially roadway track bridges, with a boom swingably attached to the vehicle on which the bridge is guided in guide tracks by means of support rollers or support roller pairs respectively arranged at a distance from each other which guide tracks extend along both sides of the roadway tracks' inner longitudinal sides.

In known devices of this kind, a fork-like boom is provided for placing and picking up the bridge with which the bridge is moved out of the vehicle and placed on the opposite side of the trench, or the like to be spanned, by means of support rollers and a chain drive or the like. After this is accomplished, the vehicle must be backed off until the bridge can be placed at the ridge on the vehicle side of the trench. This placing process requires, therefore, a secure anchoring of the bridge at the far side of the trench, which exists only in exceptional cases or when the composition of the soil or ground can be improved by providing the bridge with claws.

SUMMARY OF THE INVENTION

On the other hand, it is an object of the present invention to provide a bridge placing device with simple means that places the bridge on both sides of the trench without having to back up the vehicle during placement. Further, the placing device of the present invention is capable of picking up bridges which rest in a tilted position.

This, according to the invention, is attained by providing roller support tracks at the end portions of the bridge and in the direction towards the support tracks' upper side are provided with recesses limited by means of end stops for the support rollers, which recess is smaller than the distance of the support base of the support rollers one to the other. In combination with the boom, a free-supporting suspension system of the bridge is thereby obtained with which, after setting the forward end of the bridge down at the opposite side of the trench, the rear support rollers of the support basis slide out of the guide track recesses whereby, with the help of the boom, the bridge may be placed ahead of the vehicle without the need of auxiliary means. If, subsequently, the vehicle is backed up, the outer support rollers of the support base slide out of the guide track recesses

without producing a shifting of the bridge which now rests on the ground.

Advantageously, a ramp roller top engaging surface is provided adjacent each recess of the support tracks located oppositely the end stops so that the boom, for picking up the bridge, may be stepped in very easily. By enlargement of the track profile in the region of the recesses combined therewith, bridges, which are tilted to a certain degree, may be picked up without further provisions. A simple construction of the placing device is obtained thereby, that each of the support tracks consist of a U-shaped channel at the lower girder of the bridge roadway tracks with one of the sliding surfaces connected to the ramp surface and the other sliding surface carrying a vertical end stop for the support rollers. For pick up under difficult terrain it is further advantageous when the recess is formed V-shaped between the inner longitudinal sides of the track path.

BRIEF DESCRIPTION OF THE DRAWING

Further objects, features and advantages of the present invention will become more clear from the following detailed description of a preferred embodiment shown in the drawing, wherein:

FIGURE 1 shows a side view of the tracked vehicle including the inventive device for placing a track bridge, partially in cross section showing different phases of the placing process of the bridge,

FIGURE 2 shows a top view of the end portion of the bridge including the boom and adjacent portions of the vehicle according to FIGURE 1,

FIGURE 3 shows a longitudinal cross section through the end portion of the bridge according to FIGURE 1 in an enlarged scale,

FIGURE 4 shows a cross section along line IV—IV of FIGURE 3 and,

FIGURE 5 shows a cross section along line V—V of FIGURE 3.

DETAILED DESCRIPTION OF THE INVENTION

A bridge **2** having parallel roadway tracks is arranged on a tracked vehicle **1** in its transporting position, as shown in dot and dash lines in FIGURE 1, by a boom **3** and a rear support bracket **4**. The boom **3**, constructed as a single box-section, extends between the roadway tracks **5** and **6** of the bridge **2** and is swingably arranged about a pivot **7** at the vehicle **1**. For the operation of the boom **3**, two hydraulic working cylinders **8** are provided which are connected between the vehicle and both sides of the short arm **9** of the boom **3**. The long arm **10** of the boom **3** is provided at its front end and at each side of the box-section with bearing rollers **11** having a common axle of rotation, and at a distance therefrom with a bearing roller pair **12**. The bearing roller pair **12** is driven hydraulically or electrically by a motor **13** built into the box-section and effects the forward longitudinal movement of the bridge during placement. The tracks or sections **5** and **6** of the bridge **2**, which may be constructed of box-sections or of latticed girders and held in spaced relationship by connecting members **25**, are provided at the inner longitudinal sides **5'** and **6'** with U-shaped support channels or tracks **14** and **15**. The support tracks **14**, **15** are at both end portions **16** of the bridge and substantially parallel to the top side of the track path **17**, provided with a cut-out or recess S which is smaller than the support basis B of the bearing rollers **11** and **12** one to the other. The cut-out S is limited by means of a stop **18** and an upwardly diverging ramp surface **19**. The stop **18** is arranged at the end of the lower roller engaging surface **20** of each of the support tracks **14**, **15** whereas the ramp surface **19** forms an extension of the upper

roller engaging surface **21** for the support rollers and run out wedge-shaped to the track path **17**. The inner longitudinal sides **5'** and **6'** of the roadway tracks are provided, in the region of the cut-out S, with V-shaped lateral surfaces **22, 23** at an angle one to the other (FIGURE 5) which extend between the upper side of the track path **17** and the perpendicular leg of the guide tracks **14** and **15**.

For placing the bridge **2** from the transporting position shown in dot and dash lines in FIGURE 1 into a use position shown in full lines and when the bridge is unloaded, it is first moved out until the support rollers **12** contact the stop **18** of the support tracks. The bridge in this position is held self-supporting with the basis B of the support rollers **11** and **12**. A hydraulically operated scraper blade **24** that may be arranged on the vehicle front could be used in support of the steadiness of the vehicle. By lowering the boom **3**, the bridge, as indicated in dashed lines in FIGURE 1, is set onto the opposite side of the trench whereafter the bearing rollers **12** may slide out of the cut-out S. By further lowering of the boom **3**, the bridge **2**, as shown, will be set onto the ground in front of the vehicle **1**. If now the scraper blade **24** is raised, the vehicle can be backed up whereby the support rollers **11** slide positively out of the cut-out S. Thereafter, the bridge may be used for crossing the trench.

Loading of the bridge logically may be accomplished in the reverse sequence whereby the V-shaped side surfaces **22, 23** of the cut-out S as well as the run-up surface **19** may be used for guiding the support rollers **11** of the boom **3** into the support tracks **14, 15**. With the help of the ramp surface **19** of the support tracks it is further possible to pick up the bridge placed on an angle or resting in a tilted position as shown in FIGURE 4.

The invention is not limited to the placement of a rigid bridge as illustrated but logically also to draw and telescope-like movable bridges. Further modifications, variations and embodiments in addition to the specifically described preferred embodiment are contemplated within the spirit and scope of the invention as defined by the following claims.

I claim:

1. A vehicle arrangement for the placing of a prefabricated bridge, comprising: a powered vehicle; a prefabricated bridge having two longitudinally extending substantially parallel roadway sections; a boom pivotally mounted to the powered vehicle and having means for slidably supporting the bridge for movement relative to the motor vehicle in the longitudinal direction of the bridge; power means for pivoting said boom; said supporting means including longitudinally aligned spaced support rollers on said boom and support tracks extending longitudinally along said bridge and receiving therein said support rollers; each of said support tracks at the longitudinal end of said bridge rearward of the advancing direction of said bridge relative to said vehicle having an upwardly opening roller exiting recess of a longitudinal extent at least as great as one roller but less than the longitudinal distance between said longitudinally aligned spaced support rollers, and a rear stop on said support track for engaging the rearmost roller for limiting forward advance of said bridge relative to said powered vehicle.

2. The vehicle arrangement according to claim **1**, wherein each of said support tracks includes a longitudinally extending upper roller engaging surface that rearwardly diverges upwardly immediately forward of said recess providing means for guiding the support rollers into and out of said support tracks during pick up and placement of said bridge, respectively.

3. The vehicle arrangement according to claim **2**, wherein each of said support tracks consists of a side opening U-shaped channel longitudinally extending along the lower portion of each roadway section, respectively, and having lower support roller engaging longitudinally extending surface; said lower roller engaging surface being joined at its rearmost end to the rear stop extending substantially perpendicular thereto.

4. The vehicle arrangement according to claim **1**, including downwardly and inwardly extending surfaces on each longitudinal inner side of said roadway tracks joined to the upper portion of said support tracks forming in part the outside walls of said recesses.

5. The vehicle arrangement according to claim **1**, wherein each of support tracks comprises a generally inwardly opening longitudinally extending channel member; said support rollers being mounted on opposite sides of said boom for engagement in respective ones of said channel members and being longitudinally spaced from each other on each side of said boom.

6. The vehicle arrangement according to claim **1**, wherein said power means engage between at least one of said support rollers is power driven for powered movement of the bridge relative to the vehicle.

7. The vehicle arrangement according to claim **1**, wherein said boom is mounted on said vehicle for pivotal movement about a horizontal axis extending generally perpendicular to the longitudinal direction of said bridge; rearward support means for receiving the rearward end of said bridge in its transport position; said vehicle having a ground engaging scraper blade mounted on its forward portion for clearing land and for engaging the ground as an outrigger supporting the vehicle during extension of the bridge forwardly.

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