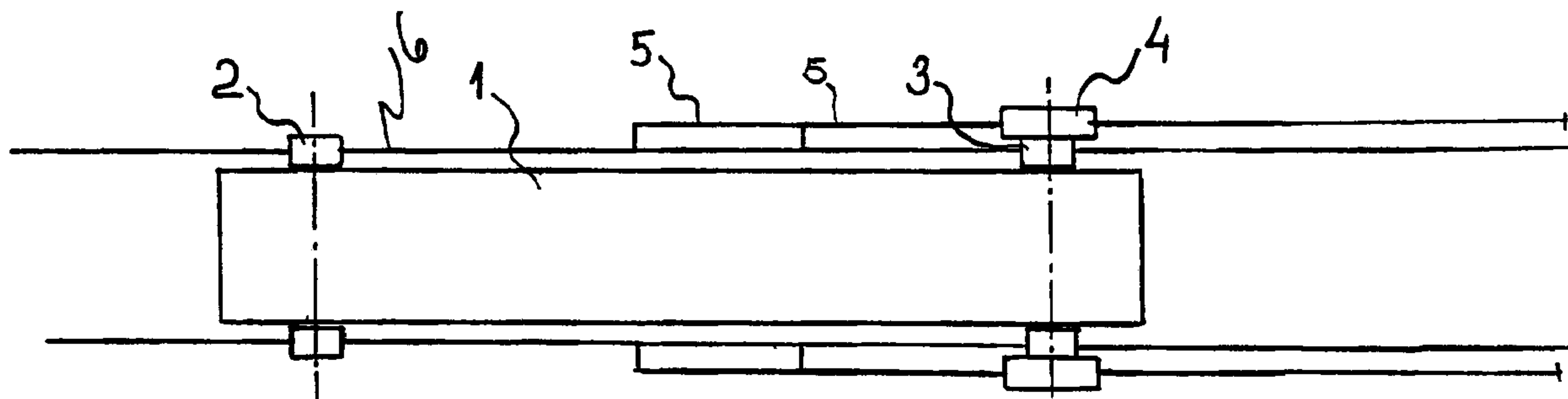




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(54) Titre : ASSEMBLAGE POUR LE TRANSFERT DE ROULEAUX DE PAPIER  
 (54) Title: ASSEMBLY FOR TRANSFERRING PAPER ROLLS



(57) Abrégé/Abstract:

The present invention relates to a carriage and track assembly for transferring paper and paperboard rolls along an inclined track. The invention serves for the transfer of paper rolls of slippery grades and is based on adapting a dual track over the length of the inclined section of the transfer track and arranging compatible wheel sets to the transfer carriage so that the front end of the carriage is provided with a wheel assembly in which the rolling perimeter varies at different trackwidths of the assembly so that said wheel assembly can be made to run along the inclined sections of said tracks so that in said wheel assembly the rolling perimeters of its elements running on different tracks are vertically located at different heights from the loading platform of the carriage.

**ABSTRACT**

The present invention relates to a carriage and track assembly for transferring paper and paperboard rolls along an inclined track. The invention serves for the transfer of paper rolls of slippery grades and is based on adapting a dual track over the length of the inclined section of the transfer track and arranging compatible wheel sets to the transfer carriage so that the front end of the carriage is provided with a wheel assembly in which the rolling perimeter varies at different trackwidths of the assembly so that said wheel assembly can be made to run along the inclined sections of said tracks so that in said wheel assembly the rolling perimeters of its elements running on different tracks are vertically located at different heights from the loading platform of the carriage.

**Assembly for transferring paper rolls**

5 The present invention relates to a carriage and track assembly for transferring paper and paperboard rolls along an inclined track.

10 Rolls manufactured in paper mills must often be moved even for long distances by means of various transfer systems. Prior to the wrapping of the rolls in a protective wrapper, they must be handled  
15 cautiously to avoid damages to the rolls from impacts on their outer plies or from frictional forces imposed on the roll due to changes in roll speed. A particular problem in the transfer of coated and calendered paper is so-called telescoping of the roll, that is, sliding-out of the inner plies  
20 of roll relative to the outer plies so that the center of the roll protrudes out from the end of the roll. Generally, the acceleration of the roll in its axial direction can be kept sufficiently low during the start and stop of the longitudinal transfer motion of the roll so that telescoping of the roll is avoided. However, the risk of telescoping prevents the longitudinal  
25 transfer of rolls of slippery paper grades along inclined tracks, because the plies of the paper roll easily slide with respect to each other even at very small angles of slope of the track. This hampers the use of inclined transfer tracks, and in fact, any transfer of the roll possibly  
30 required in the vertical direction from one elevation to another must be implemented with the help of vertical lifts, or alternatively, the plant layout must be designed so that all movements take place in the same vertical  
35 elevation. Obviously, this constrains the plant design and thus causes additional costs.

5 It is an object of the present invention to provide a transfer arrangement capable of moving rolls, even those of slippery paper grades, along an inclined track.

10 The goal of the invention is accomplished by providing a dual track at least for the length of the inclined section of the track and providing the transfer carriage with compatible sets of wheels so that front-end wheel set of the carriage runs on a track separate from that used by the rear-end wheel set, and at least one end of the carriage has two adjacent sets of wheels with their bearing surfaces at different distances from the load bearing platform or floor of the carriage.

15 By virtue of the assembly according to the invention, it becomes possible to transfer rolls of slippery and hard-surfaced paper grades along an inclined track. Even with overlong rolls called jumbo rolls with a length of 20 3.5 m to 4 m, the angle of slope of the transfer track can be as steep as 2 - 3°, and for shorter rolls, the track may be inclined to 5 - 6°. This facility gives significant latitude in the design of the roll transfer system and plant layout. The load bearing platform of the transfer carriage can be kept in a desired position without resorting to compensation means requiring the use of active-powered actuators. 25 The transfer system operates without any moving actuator elements or additional control means, and its function is fully self-contained. The invention can be applied to both upward- and downward-inclined transfer tracks. 30

In the following the invention is described in greater detail with reference to the appended diagrams in which Figure 1 is a diagrammatic side view of an embodiment of a carriage according to the invention;

Figure 2 is a diagrammatic top view of an embodiment of a carriage according to the invention;

Figure 3 is a diagrammatic side view of another embodiment of a carriage according to the invention; and

Figure 4 is a diagrammatic top view of another embodiment of a carriage according to the invention;

Referring to Figs. 1 and 2, therein is shown a transfer carriage having first and second wheel sets 3 and respectively 4 at one (front) end of the carriage and one wheel set 2 at the other (rear) end. The wheel sets 3, 4 are located above each other so that the first or upper wheel set 3 of narrower trackwidth is situated at the same vertical distance below the load bearing platform 1 of the carriage as the rear-end wheel set 2 and these wheel sets at the front and rear end of the carriage have the same trackwidth. By contrast, the second or lower wheel set 4 at the carriage front end is adapted for a wider trackwidth. The level section of the track has only one narrow track 6, and the carriage is arranged to run thereon so that the front-end wheel set 3 of narrower trackwidth and the rear-end wheel set 2 of the same trackwidth roll on said track 6. Additionally, along the length of the inclined section of the transfer track, adjacent and parallel to the rails of the narrower main track 6, there are provided rails of another wider-spaced track 5 which are compatible with the trackwidth of the wider-spaced front-end wheel set 4. Now, when the carriage rolls onto the inclined section of the track, the wheel set 4 of wider trackwidth meets the rails of the wider track 5, and the front end of the

carriage will be supported running on these wheels. In the beginning of the inclined section of the transfer track, the wider track and the narrower track run in different elevations adjusted to correspond to the height  
5 difference between the carriage front-end wheel sets, and said elevation difference is arranged to even out over a track length approximately equal to the wheelbase of the carriage so that, after the transition length of the inclined section of the transfer track, both tracks 5, 6  
10 again run in the same elevation. When the carriage again runs on the level section of the transfer track, the front end of the carriage resumes, in a similar manner, but in reverse order, to run on the front-end wheel set of narrower trackwidth. The height difference between the  
15 front-end wheel sets is arranged according to the angle of slope of the transfer track so that the loading platform 1 of the carriage stays horizontal during the travel of the carriage over the inclined section of the transfer track.

20

Referring to Figs. 3 and 4, an alternative embodiment is shown therein, now having the carriage front-end wheel sets 3, 4 adapted on the same axle, whereby wheels of different diameters are used for the two sets of wheels.  
25 The transitional travel of the carriage over the inclined section of the transfer track and back to a level section occurs in the same manner as described above, and the diameters of the wheel sets are selected so that the loading platform of the carriage stays horizontal at all  
30 points along the transfer track.

Besides those described above, the invention may have alternative embodiments. For instance, the transfer system may comprise carriages coupled to each other by a  
35 chain, whereby the chain is driven by an electric motor. Alternatively, the carriages may be self-powered or they may be transferred individually by an external actuator.

For wrapped rolls, the angles of slope of transfer tracks can be at least doubled by placing the loading platform of the carriage and the loading stations in an anti-inclined position, because the wrapper eliminates the telescoping risk of the roll. In this fashion the angle of slope can be increased to 10 - 12°, and in fact, the largest possible angle of slope is only limited by the stability of the roll on the loading platform. The adjacently or concentrically mounted wheel sets can be replaced by conical wheels, whereby one of the tracks of the inclined section is smoothly widened/narrowed in the beginning and end, respectively, of the inclined section of the transfer track. By virtue of such an arrangement, the trackwidth of the conical wheel can be made to vary simultaneously also varying the rolling diameter of the wheel so as to keep the loading platform of the carriage in a horizontal position. The tracks may have different trackwidths over the level section of the transfer track, and the wheels can be to run on a single pair of tracks over the inclined section of the transfer track. The loading platform need not necessarily be horizontal on any section of the transfer track and its longitudinal inclination may vary. However, the track angle may not be allowed to become so steep on any section of the transfer track that any telescoping risk of the roll might occur.

## CLAIMS

1. An assembly for transferring paper rolls, said assembly comprising
  - a transfer track which includes an inclined section, and
  - at least one transfer carriage having wheel sets at each end of the carriage adapted to convey the carriage on said track, the transfer carriage including a load bearing platform,

5

characterized in that

  - said assembly includes a dual track with different track widths at the inclined section of the transfer track, and
  - the wheel set at one end of the carriage is a dual wheel set comprising first and second wheels spaced transversely and vertically apart wherein the first wheels are adapted to bear on said transfer track, and the second wheels are adapted to bear on the other track of the dual track, whereby the first wheels support one end of the carriage over the non-inclined sections of the transfer track and the second wheels support the one end of the carriage over the inclined section of the transfer track.

10

15
2. The assembly of claim 1, wherein the dual wheel set comprises first wheels of the same diameter as, and displaced below the loading platform the same distance as, the wheel set at the other end of the carriage, and the second wheels are spaced laterally outwardly and below said first wheels.

20

3. The assembly of claim 1, wherein said first wheels and said second wheels are of the same diameter, with the axis of rotation of the second wheels displaced below the axis of rotation of the first wheels.
4. The assembly of claim 1, wherein the dual wheel set comprises co-axial first and second wheels, wherein the second wheels have a greater diameter than the said first wheels.

25

5. An assembly as defined in any one of claims 1-4, characterized in that both of the tracks of said dual track run in the same plane over a portion of the inclined section of the transfer track.

6. An assembly as defined in claim 1, characterized in that each track of the dual track runs is at different elevations at the beginning and end of the inclined section of the transfer track.
- 5 7. The assembly of any one of claims 1-6, wherein the vertical distance between the bearing surface of the first wheels and the second wheels is correlated with the distance between said wheel sets whereby the load bearing platform is maintained at the same slope during movement of the carriage over all portions of the track.
- 10 8. The assembly of claim 7, wherein the load bearing platform is maintained horizontally.

Fig 1

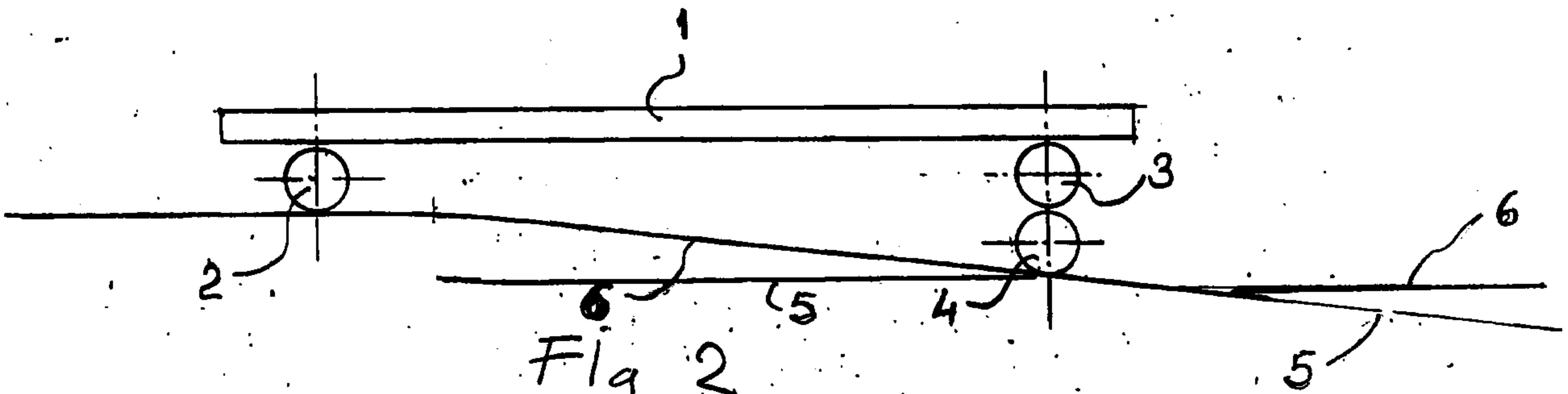


Fig 2

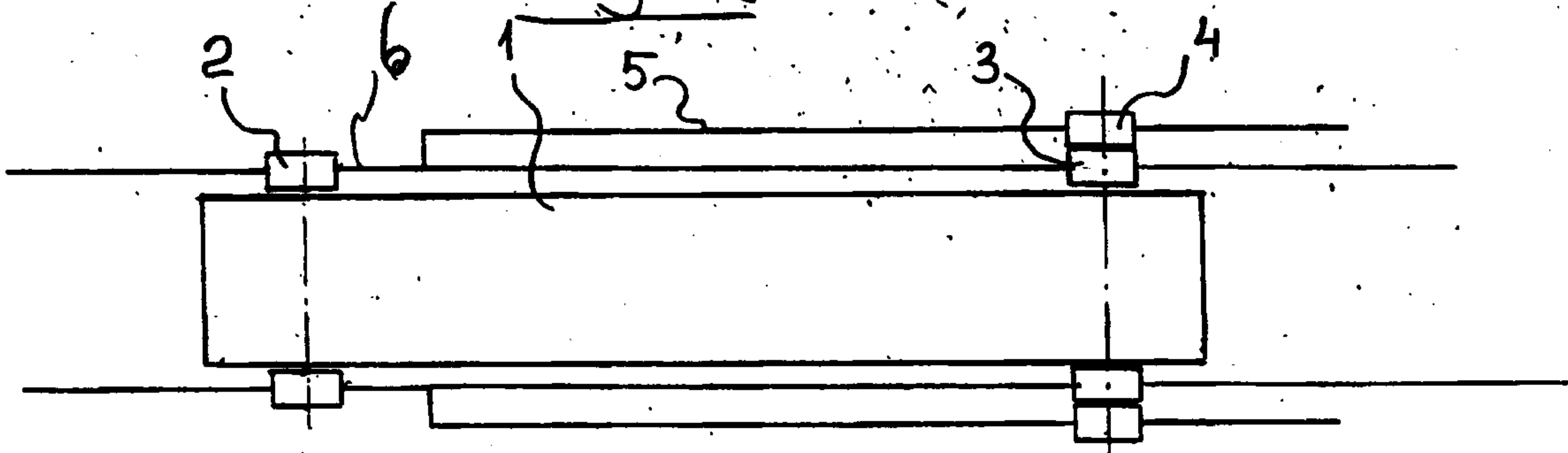


Fig 3

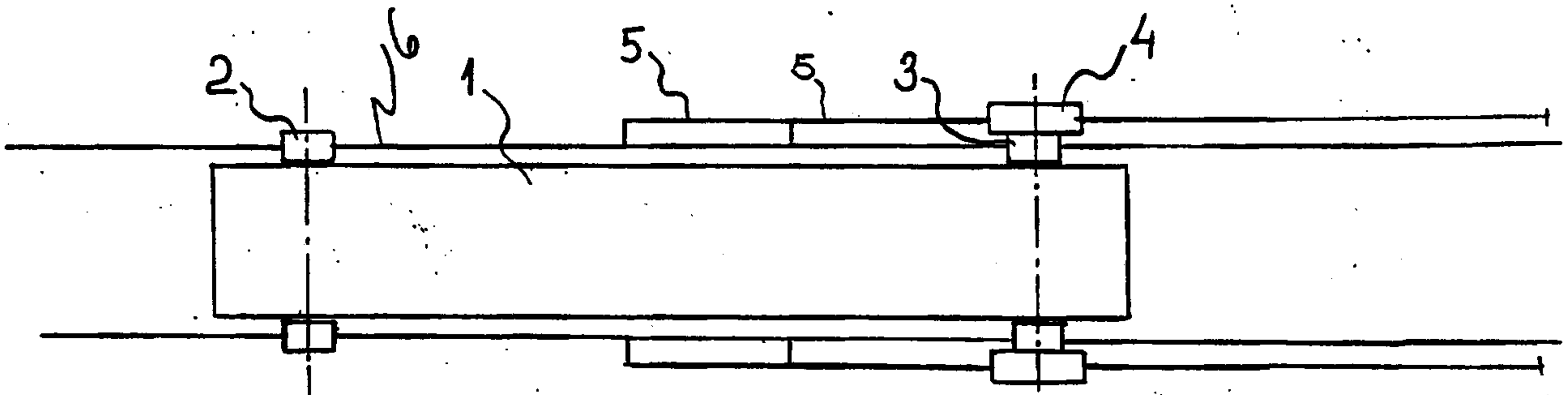
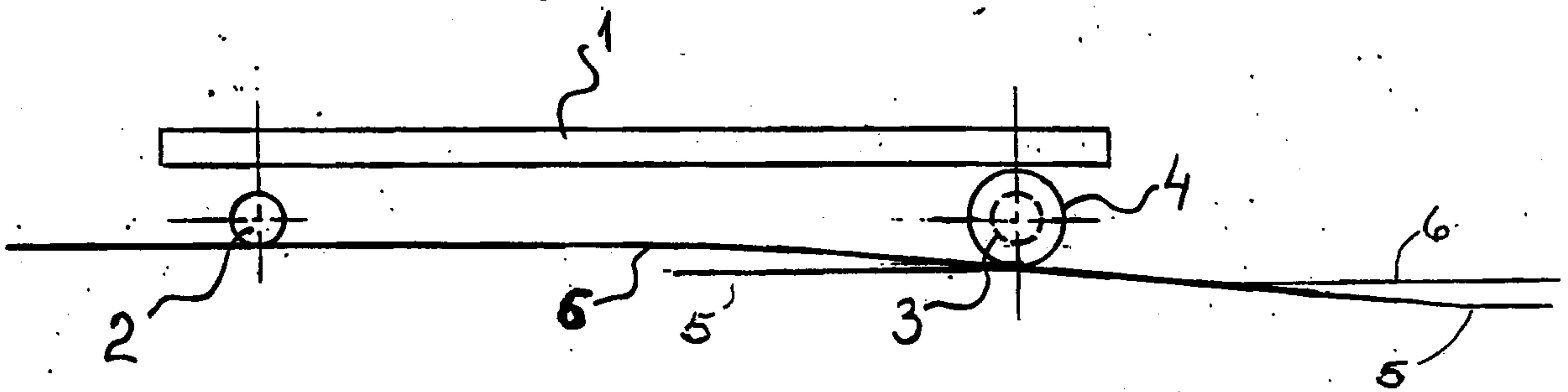


Fig 4

