

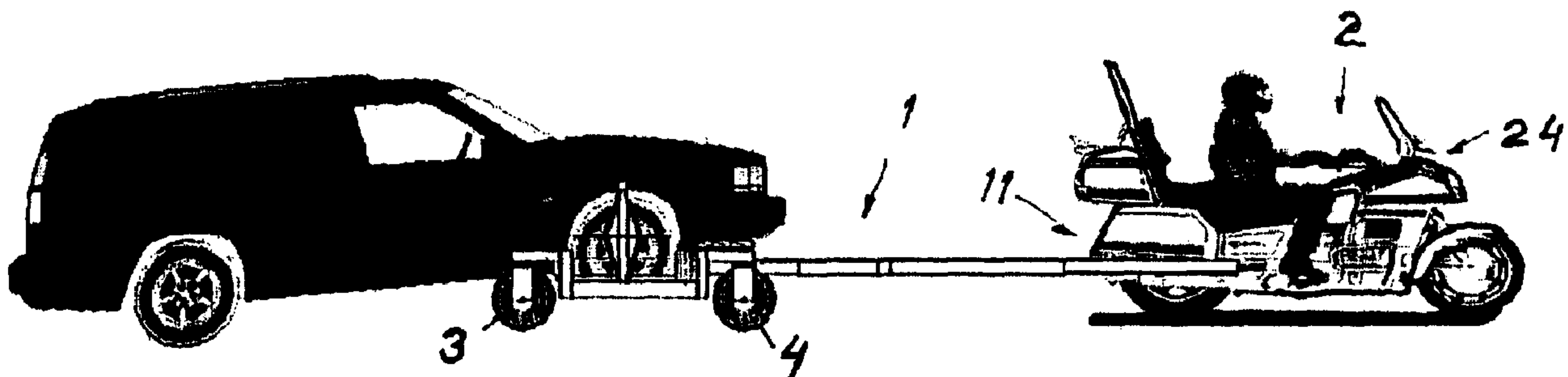


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(54) Title: TOWING CARRIAGE



(57) Abrégé/Abstract:

The invention relates to a tow carriage, especially for towing motorcars with the aid of a motor-cycle (2) or some other small vehicle. The carriage (1) comprises at least two wheels (3, 4 and 5, 6) which supported are steerable by means of a steering device (22, 23) and via articulated pulling rods (7-10) can be coupled to preferably, the rear frame portion (11) of the motor-cycle. On said pulling rods (7-10) there is, at each respective joint (16, 17), mounted an angle information transmitter (18, 19) which, when the rods (7, 9 and 8, 10) turn relatively each other in response to the motor-cycle (2) turning, actuate the steering device (22, 23) steering the wheels or, alternatively, said steering device (22, 23) being actuated by a direction sensor mounted on the motor-cycle (2) in order to detect acceleration and turning/banking, the wheels (3, 4 and 5, 6) always assuming a correct steering angle as determined by the route of the motor-cycle (2).

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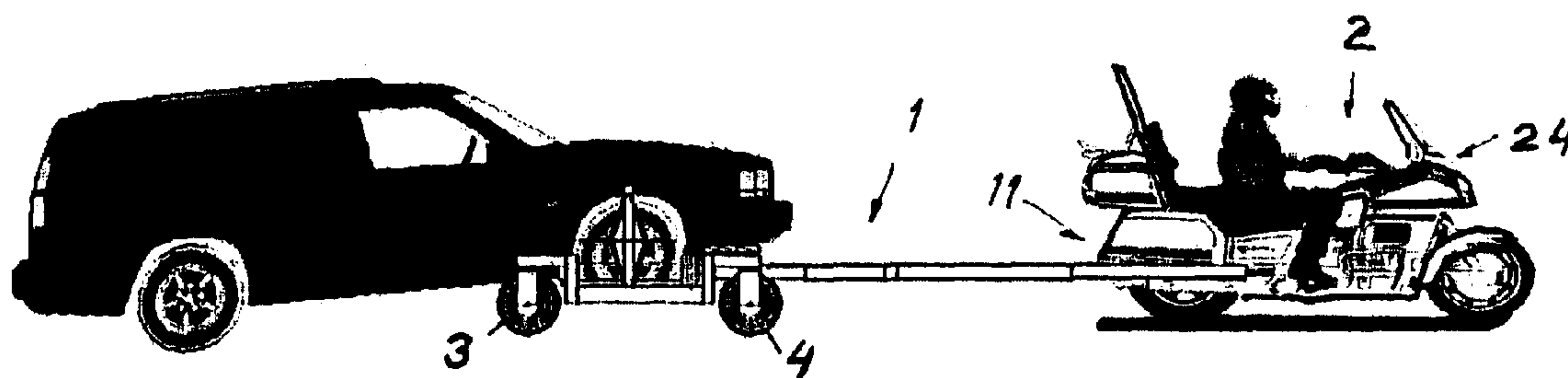
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(54) Title: TOWING CARRIAGE



(57) **Abstract:** The invention relates to a tow carriage, especially for towing motorcars with the aid of a motor-cycle (2) or some other small vehicle. The carriage (1) comprises at least two wheels (3, 4 and 5, 6) which supported are steerable by means of a steering device (22, 23) and via articulated pulling rods (7-10) can be coupled to preferably, the rear frame portion (11) of the motor-cycle. On said pulling rods (7-10) there is, at each respective joint (16, 17), mounted an angle information transmitter (18, 19) which, when the rods (7, 9 and 8, 10) turn relatively each other in response to the motor-cycle (2) turning, actuate the steering device (22, 23) steering the wheels or, alternatively, said steering device (22, 23) being actuated by a direction sensor mounted on the motor-cycle (2) in order to detect acceleration and turning/banking, the wheels (3, 4 and 5, 6) always assuming a correct steering angle as determined by the route of the motor-cycle (2).



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Towing carriage

The present invention relates to a tow carriage for towing in the first place motorcars with the aid of a motor-cycle or
5 some other small vehicle.

Today special break-down lorries are usually used to tow vehicles which have being hit by a failure or for some other reason requires towing. These break-down lorries occupy much
10 space on the road and often find it difficult to proceed which can be troublesome, especially when the traffic is jamming. When a private passenger car has suffered a engine failure in a traffic queue it is accordingly practically impossible for an ordinary break-down lorry quickly to reach the correspon-
15 ding place and to carry out a towing operation.

The object of the present invention is, as a towing vehicle, to use a motor-cycle or some other small vehicle. In contrast to an ordinary break-down lorry, a motor-cycle can conveniently and rapidly reach the position of the car. According to
20 the invention use is made of a motor-cycle and a tow carriage, the car being towed by the motor-cycle. The features characterising the invention are set out in the claims.

Thanks to the invention there has now been provided a tow carriage for towing motorcars with the aid of a motor-cycle or some other small vehicle, this carriage satisfying the requirement in an excellent way and being at same time cheap and easy to manufacture. The tow carriage does solve the traf-
30 ficability problems to which the traditional break-down lorries are exposed. The tow carriage can assume a transport position which is used when the motor-cycle is on its way to the stationary car. In that context it is important that the transverse measures of the carriage are not much greater than those of the motor-cycle so that the trafficability of the
35 vehicle combination is not reduced.

When in its used position the tow carriage is arranged in a way making it possible for it to absorb the forces caused by

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the towed motorcar. In the used position the parts of the tow carriage are mounted and the pulling rods used are extended to their full length. What both facilitates and makes possible use of a motor-cycle for the operation is that the structure of the carriage, and not the motor-cycle, absorbs all vertical forces generated when a motorcar is to be towed away. The only task of the motor-cycle is, with the aid of its engine, to move both the tow carriage and the motorcar places thereon. The force absorption is attained thanks to the fact that the carriage is provided with wheels of its own which are articulated. The pulling forces include a joint where an angle information transmitter is mounted and, when the motor-cycle makes a turn, the pulling forces turn in relation to each other and the angle then formed, feeds data to the steering devices used which control the angles of the four wheels of the carriage. When a braking operation is carried out it is controlled from the motor-cycle and all wheels of the carriage are actuated.

When in its transport state the tow carriage is in a collapsed position meaning that all of it can be accumulated for transport on motor-cycle, the increase width being as marginal as possible. Also, in that state the pulling rods used at the carriage are then in a telescoped position meaning that they do not substantially project in front of or behind the motor-cycle.

When the carriage is placed below the vehicle to be towed it is a significant advantage that the pulling rods can be turned and inserted laterally below i.e. the front wheels of the car to be towed.

In one broad aspect, there is provided a tow carriage for towing cars with the aid of a motor-cycle or other small vehicle, comprising at least two wheels

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supporting said carriage, the wheels being steerable by means of a steering device and via articulated pulling rods adapted to be coupled to a rear portion of a motor-cycle frame or other small vehicle frame having, at each
5 individual joint an angle position transmitter which, when the rods turn relatively each other in response to the motor-cycle or other small vehicle turning, actuates the steering device steering the wheels, said wheels always assuming a correct steering angle as determined by the route
10 of the motor-cycle or other small vehicle.

In another broad aspect, there is provided a tow carriage for towing cars with the aid of a motor-cycle or other small vehicle comprising at least two wheels supporting said carriage, the wheels being steerable by
15 means of a steering device and via articulated rods adapted to be coupled to a rear portion of a motor-cycle frame or other small vehicle frame, the steering device being actuated by a direction sensor attached to the motor-cycle or other small vehicle and detecting acceleration, turning
20 and banking, said wheels always assuming a correct steering angle as determined by the route of the motor-cycle or other small vehicle.

A preferred embodiment of the invention will now be described more in detail, reference is being made to the
25 drawings.

Fig. 1 is a lateral view illustrating a carriage according to the invention which can be used for towing motorcars with the aid of a motor-cycle;

Fig. 2 illustrates the carriage in Fig. 1 in lateral view but without the motor-cycle ;

Fig. 3 is a top view of the carriage;

Fig. 4 is a rear view of the carriage;

Fig. 5 is a perspective view illustrating the carriage as seen obliquely from above;

Fig. 6 is a view similar to that in Fig. 5 and more clearly illustrating the turning angle between the pulling rods and the wheels of the carriage;

Fig. 7 does on an enlarged scale show one of the wheel pairs used in the carriage and shown in Fig. 6 and;

Fig. 8-11 are four views showing the carriage during the operation collapsing it to the transport state.

The figures illustrate a preferred embodiment of the invention, a carriage 1 for towing motorcars with the aid of motor-cycle 2. The carriage 1 comprises at least two wheels 3-6 which support it and can be steered with the aid of steering devices 22 and 23. Via articulated pulling rods 7-10 they can be coupled to the motor-cycle 2, preferably its rear frame portion 11. Thanks to this solution all vertical forces generated during the towing with the aid of the motor-cycle will be absorbed by the carriage 1 instead of by the motor-cycle 2.

In the example illustrated the tow carriage comprises two wheel pairs both of which are pivoted. The pulling rods are secured to a transverse beam which at its outer portions include the respective wheel pairs 12, 13 and in those there are support means 14, 15 for the wheels of the motorcar. At each joint 16, 17 on the pulling rods there is an angle information transmitter 18, 19 which, when the rods 7, 9 and 8, 10 turn relatively each other because the motor-cycle is turning,

though via the steering devices 22, 23 control the steering of the wheels 3-6 so that those do always assume a correct steering angle as determined by the route of the motor-cycle 2. As an alternative the motor-cycle can be provided with a direction transmitter 24 controlling the steering devices 22, 23 via a cable or via radio signals.

Further, each of the wheels of the carriage 1 can be braked individually without exerting any pressure against the motor-cycle 2.

The carriage 1 does also include a lifting device 20, 21 at each wheel pair 12, 13 with the aid of which the vehicle to be towed can be lifted vertically.

Figs. 8-11 do more in detail illustrate the appearance of the carriage 1 during the collapsing operation to the transport state.

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CLAIMS:

1. A tow carriage for towing cars with the aid of a motor-cycle or other small vehicle, comprising at least two wheels supporting said carriage, the wheels being steerable
5 by means of a steering device and via articulated pulling rods adapted to be coupled to a rear portion of a motor-cycle frame or other small vehicle frame having, at each individual joint an angle position transmitter which, when the rods turn relatively each other in response to the
10 motor-cycle or other small vehicle turning, actuates the steering device steering the wheels, said wheels always assuming a correct steering angle as determined by the route of the motor-cycle or other small vehicle.
2. A tow carriage for towing cars with the aid of a
15 motor-cycle or other small vehicle comprising at least two wheels supporting said carriage, the wheels being steerable by means of a steering device and via articulated rods adapted to be coupled to a rear portion of a motor-cycle frame or other small vehicle frame, the steering device
20 being actuated by a direction sensor attached to the motor-cycle or other small vehicle and detecting acceleration, turning and banking, said wheels always assuming a correct steering angle as determined by the route of the motor-cycle or other small vehicle.
- 25 3. The tow carriage according to claim 1 or claim 2, wherein each wheel can be braked individually without exerting any pressure against the motor-cycle or other small vehicle.
4. The tow carriage according to claim 1 or claim 2,
30 wherein the carriage can be collapsed to a transport state not comprising exhibiting any projecting parts forming an

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obstacle against the passage of the motor-cycle or other small vehicle.

5. The tow carriage according to claim 1 or claim 2, wherein at the respective wheel pairs there is arranged a
5 lifting device for vertical lifting of the vehicle to be towed.

6. The tow carriage according to claim 1 or claim 2, wherein the connection with the motor-cycle or other small
vehicle is flexible permitting the motor-cycle or other
10 small vehicle to bank.

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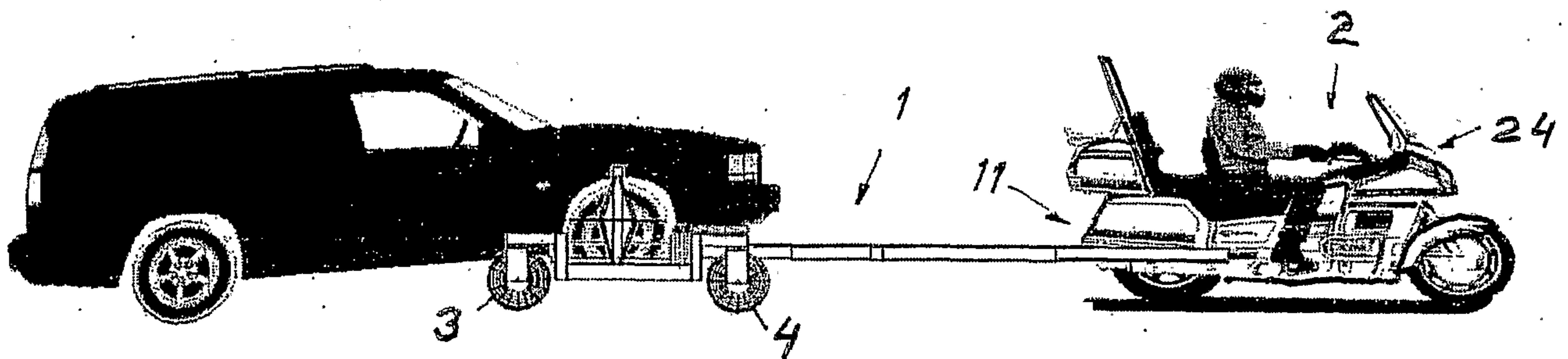


Fig. 1

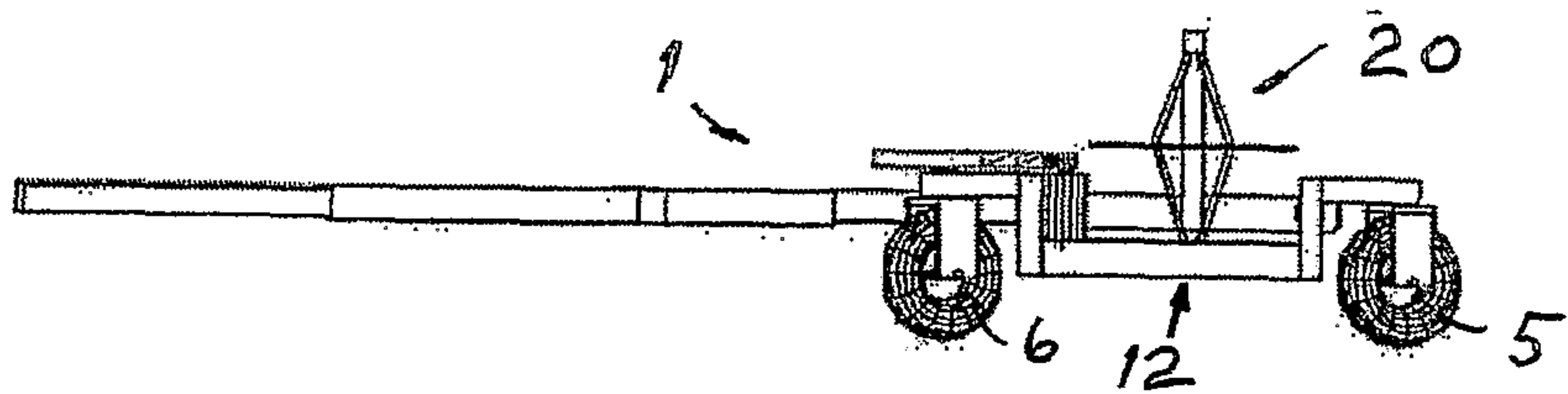


Fig. 2

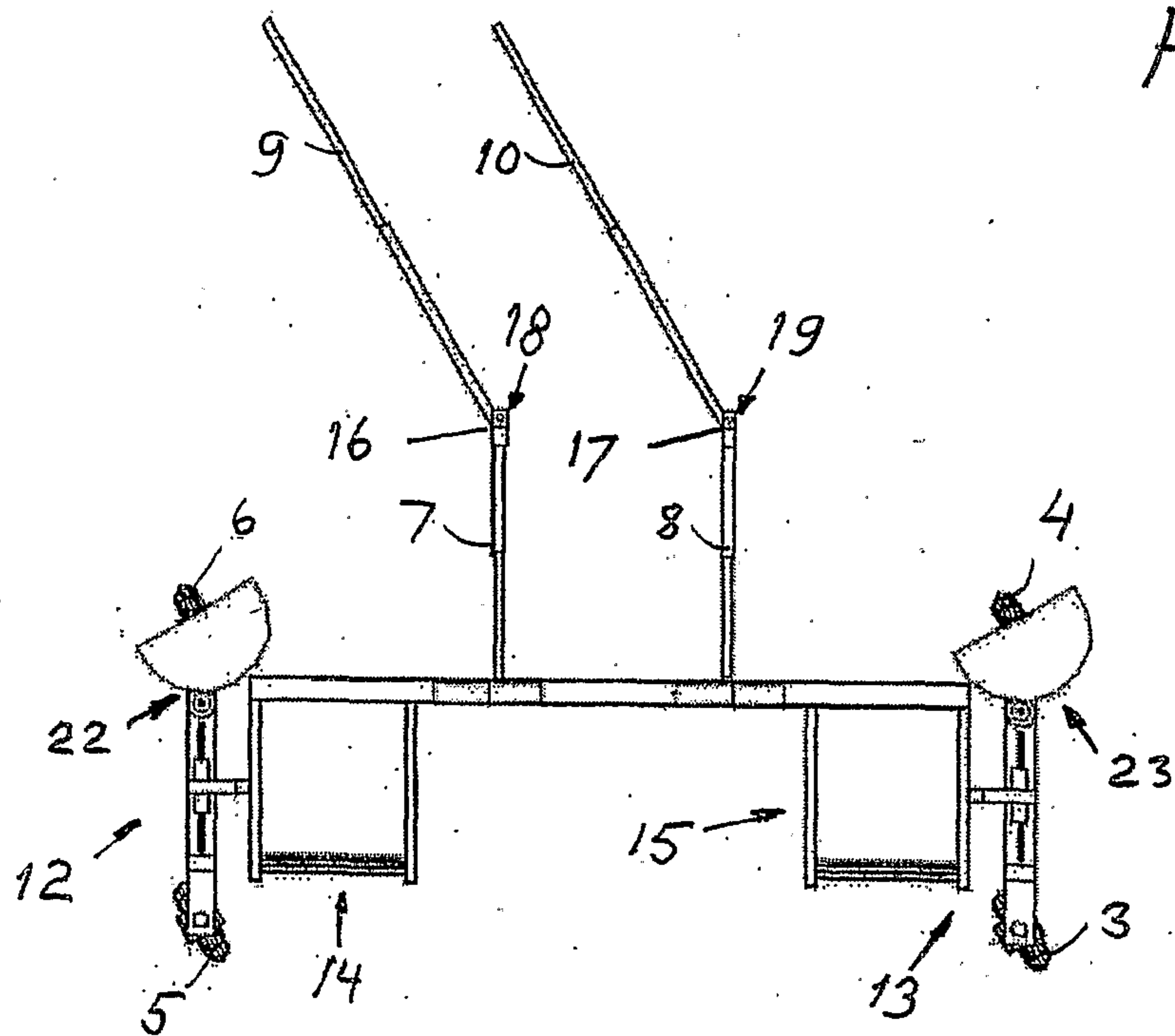


Fig. 3

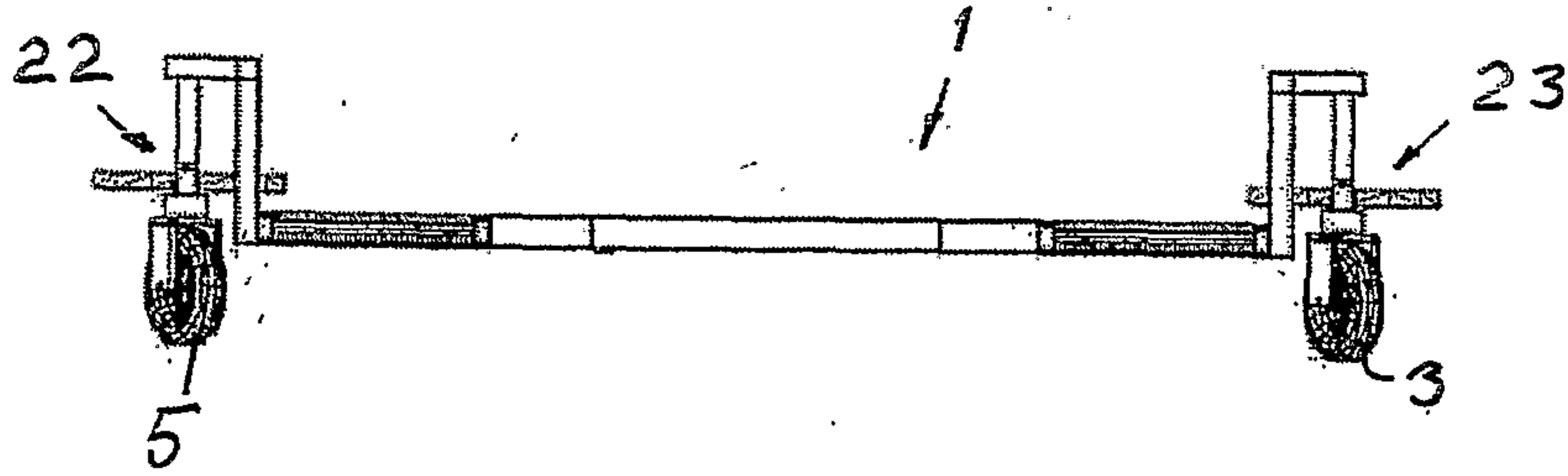


Fig. 4

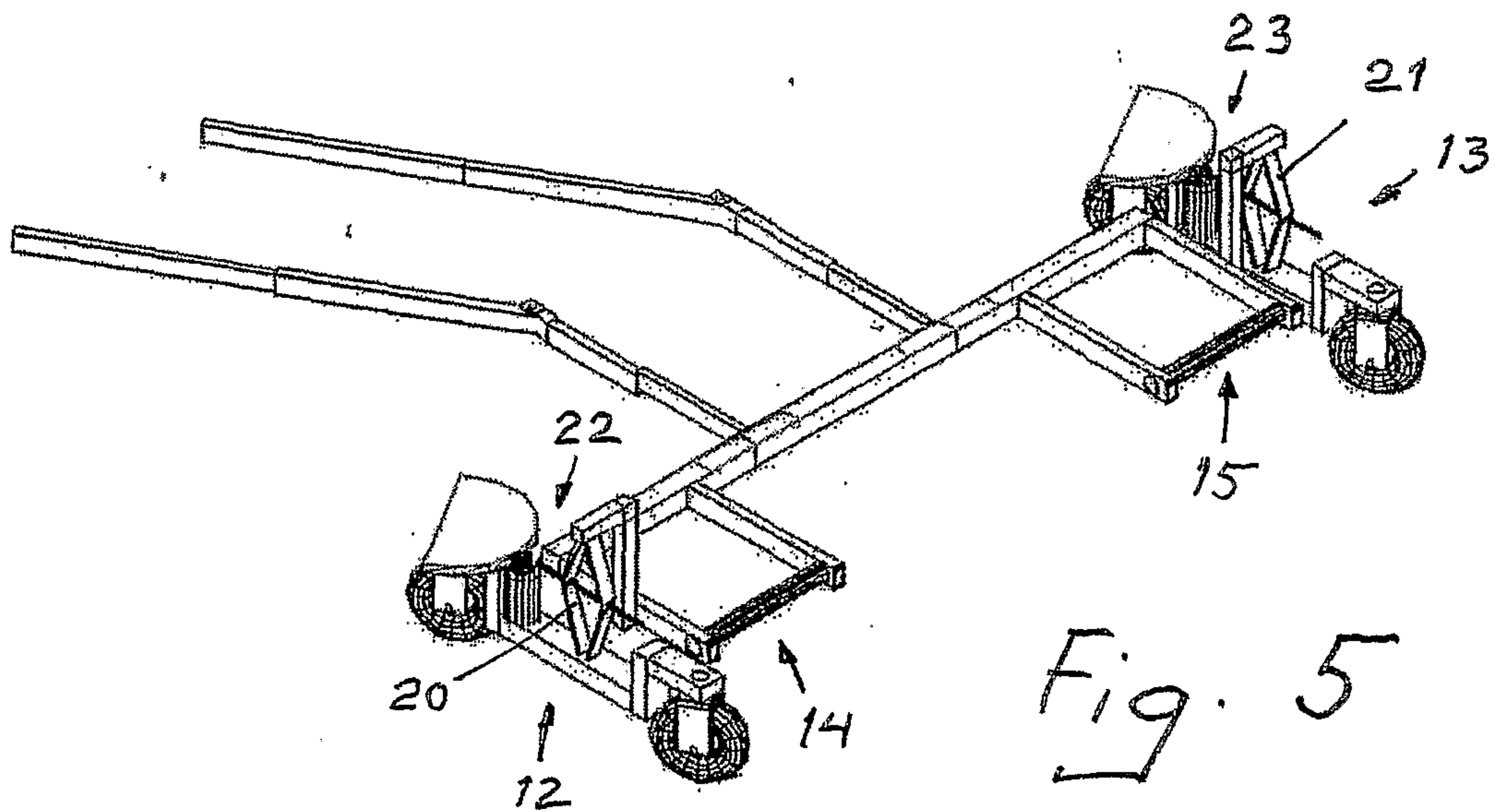


Fig. 5

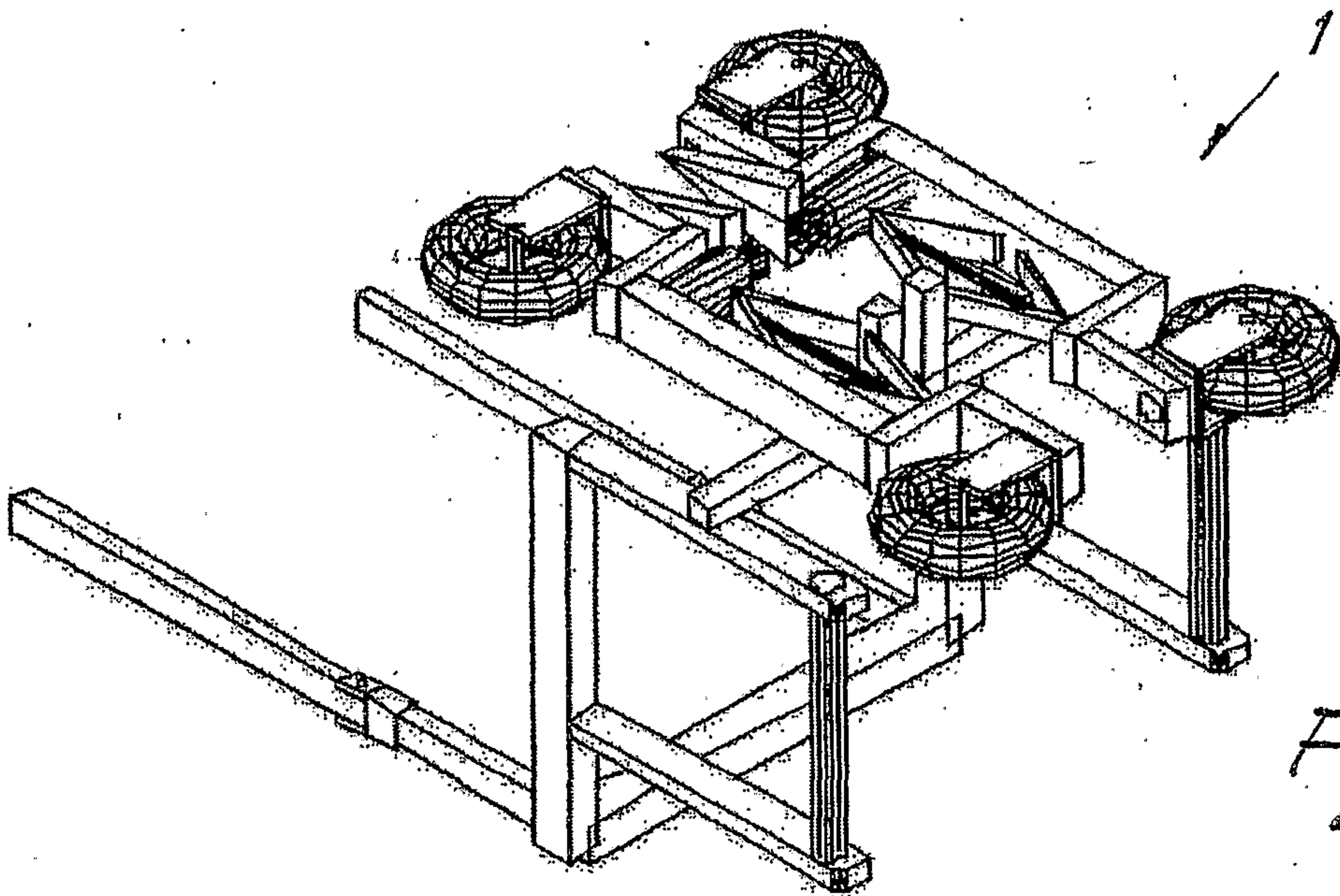


Fig. 11

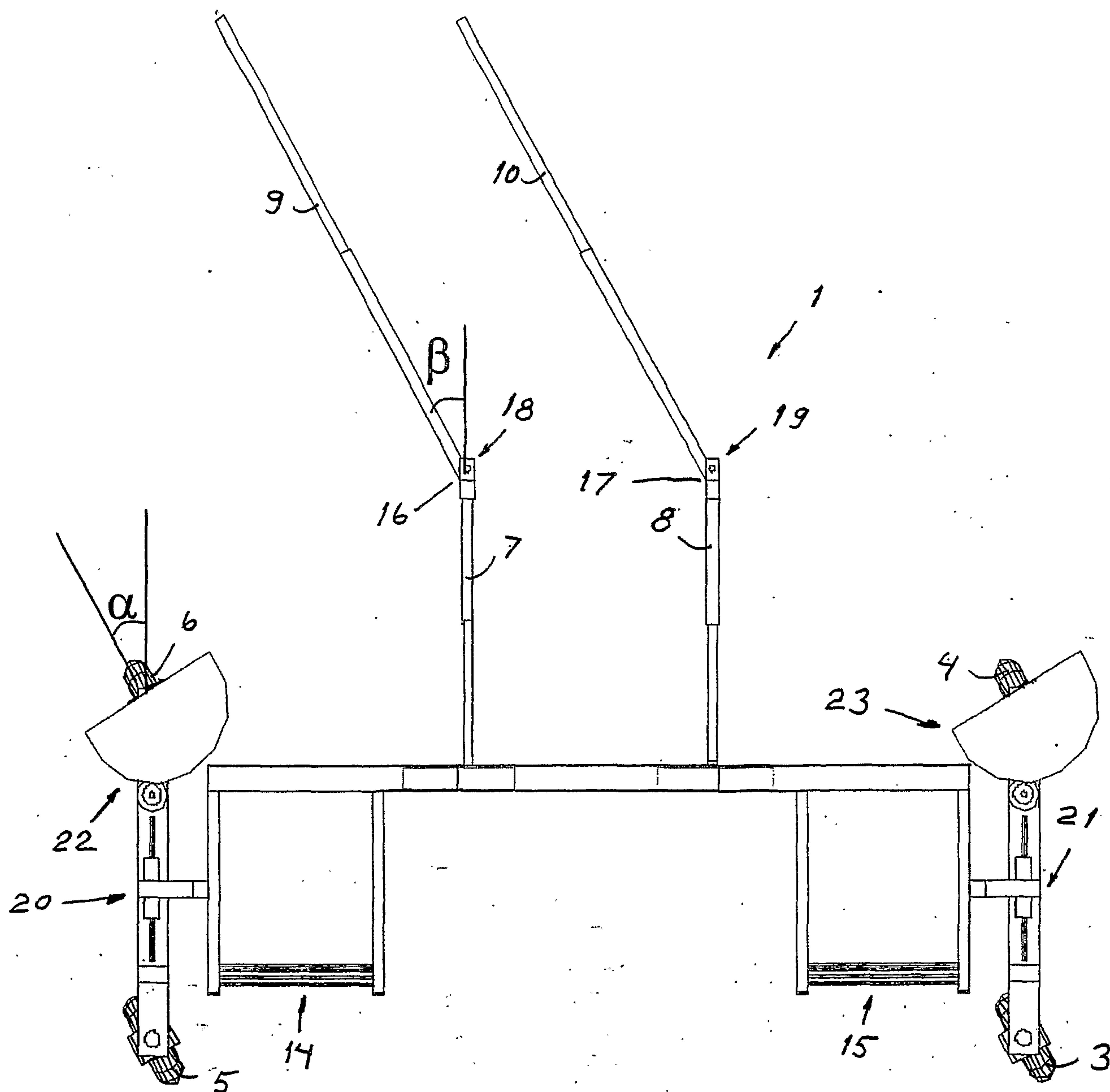


Fig. 6

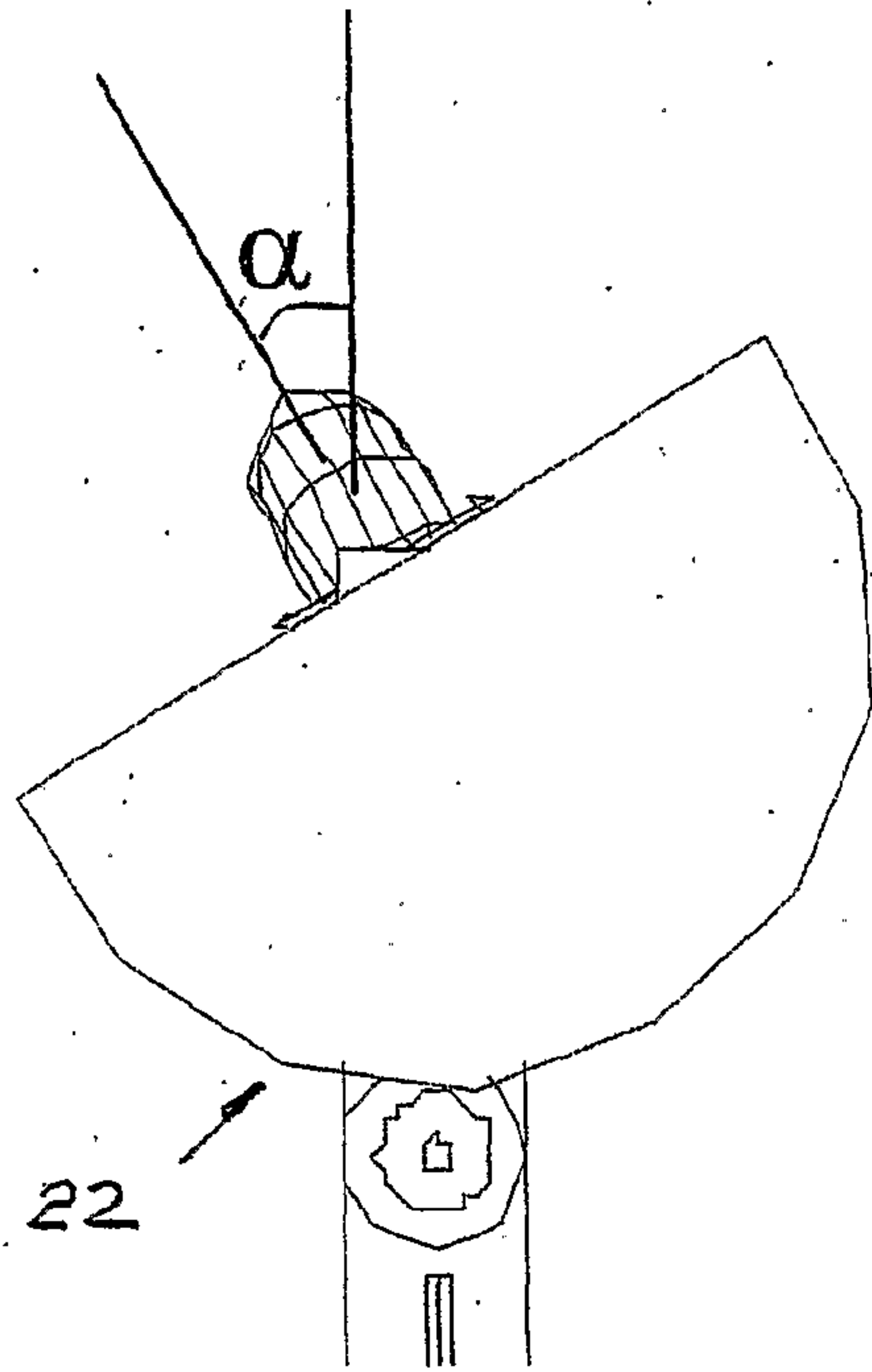


Fig. 7

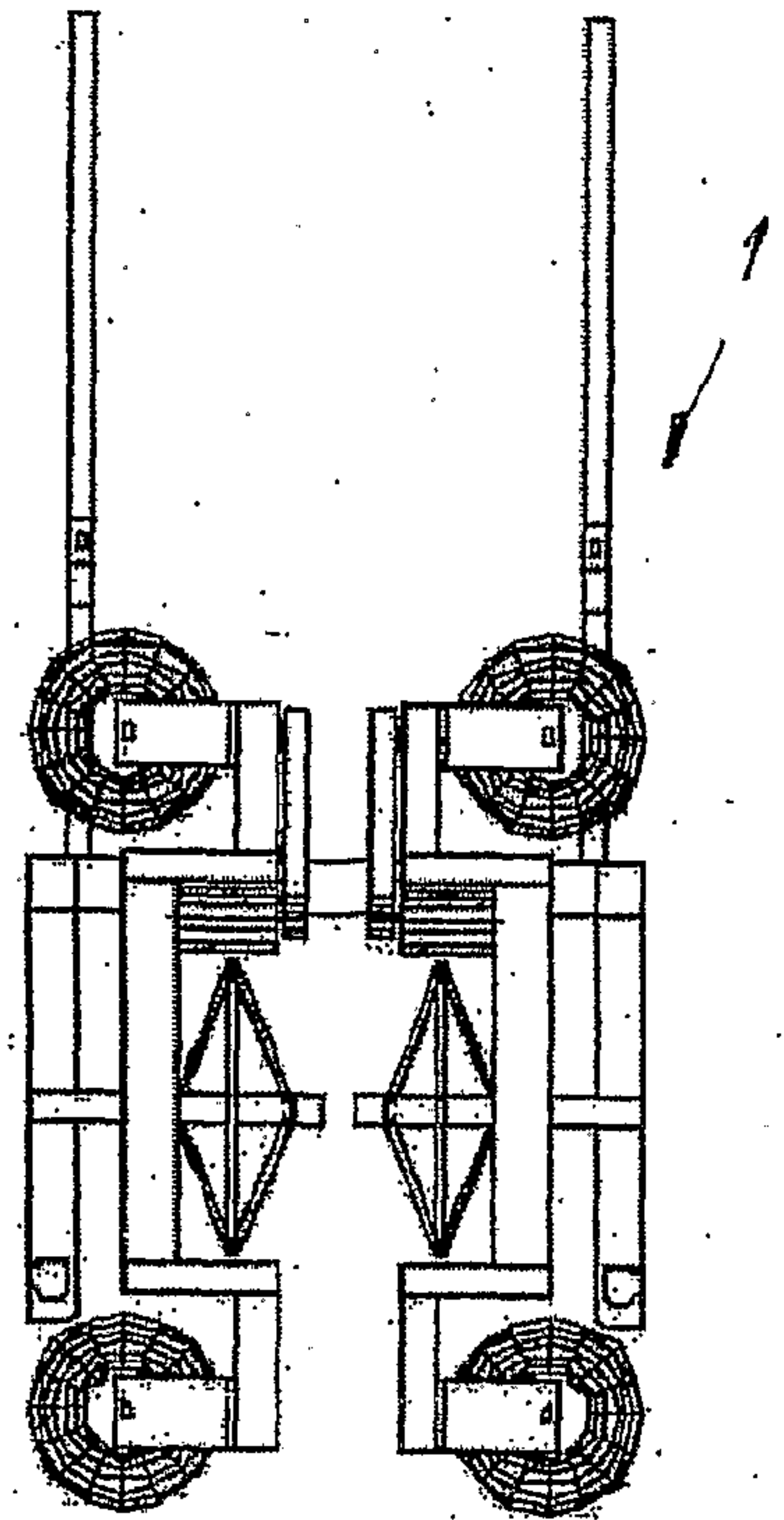


Fig. 8

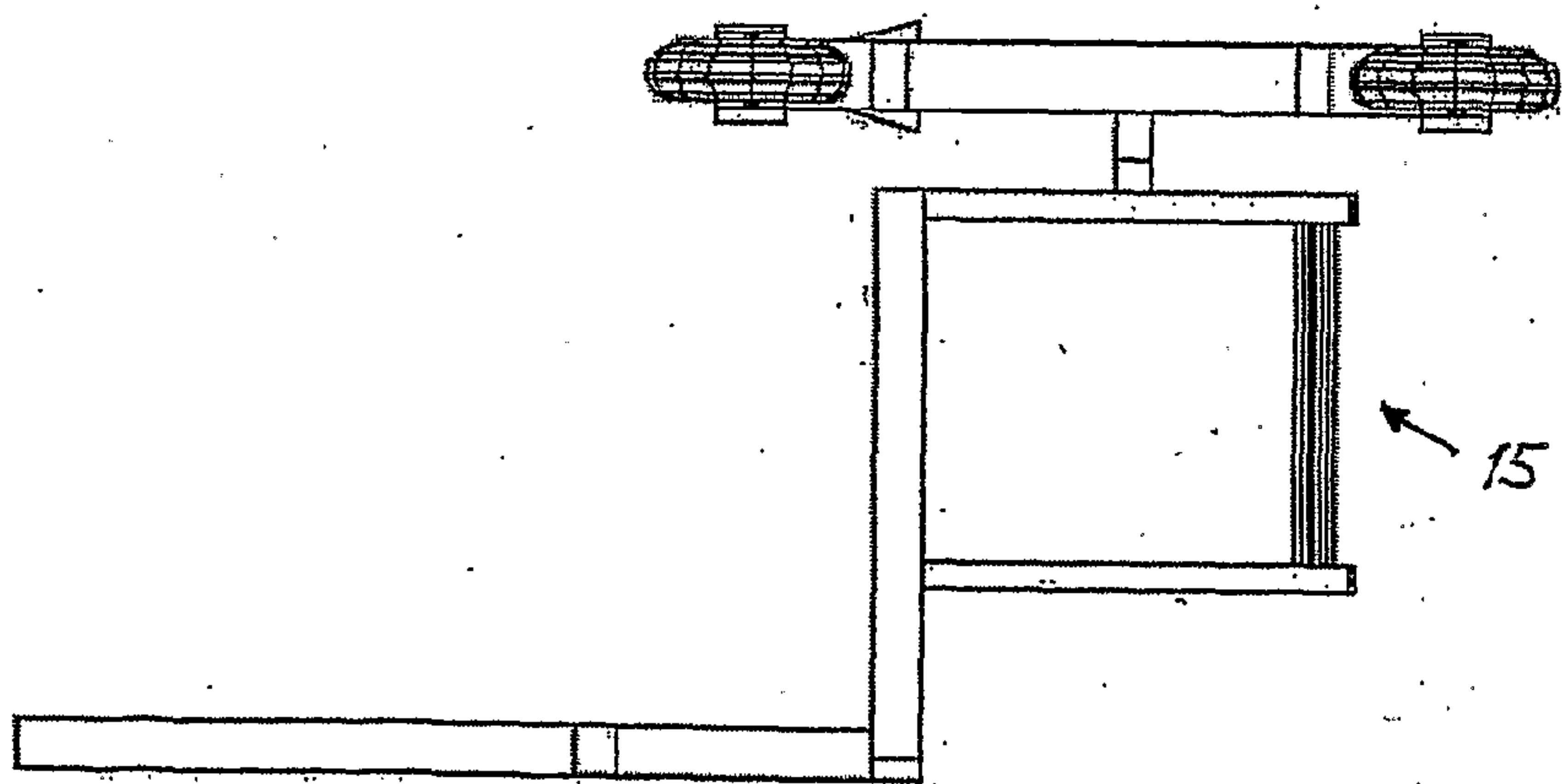


Fig. 9

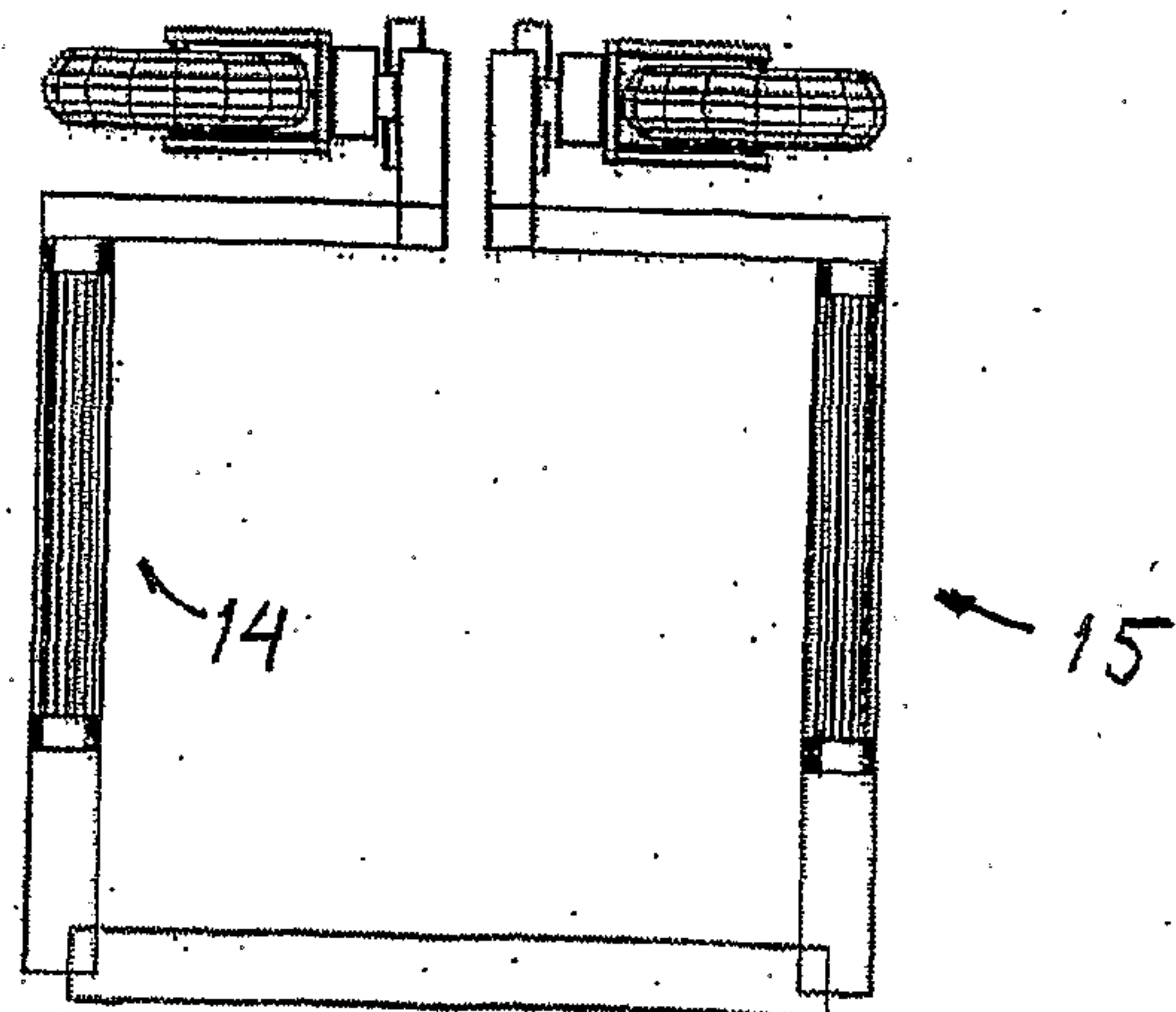


Fig. 10

