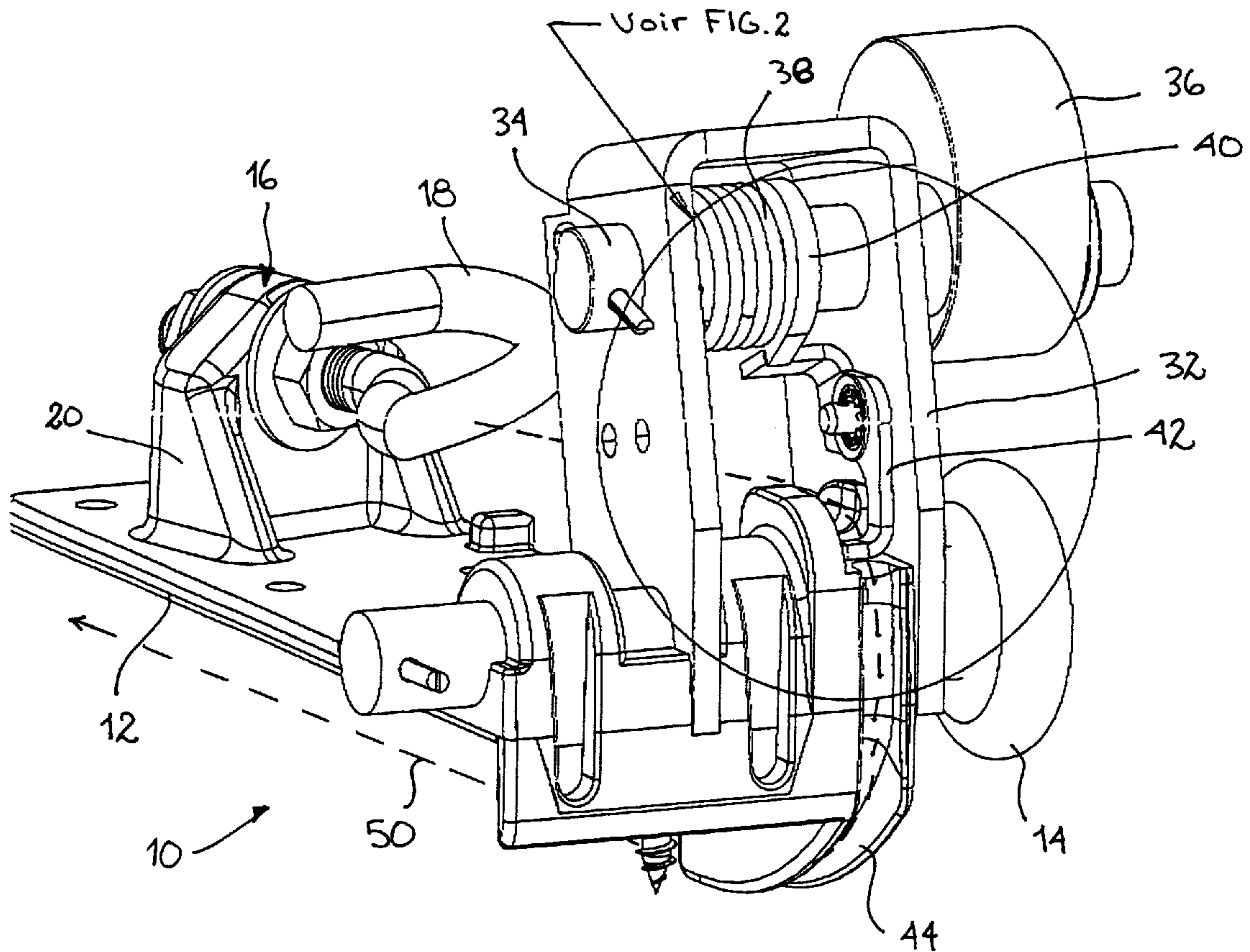




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(54) **DISPOSITIF DE PROTECTION CONTRE LES BRIS DE CABLES**
(54) **CABLE FAILURE DEVICE**



CABLE FAILURE DEVICE

The present invention relates to a safety device to be used with a garage door. It is used to hold the garage door in position in case of a rupture of one of the cables or a failure of one of the elements that holds the cables. The device ensures that the garage door does not fall all the way down and cause damages or even injuries.

Although the device was primarily designed for a garage door, it may also be used with other kinds of doors, such as slidable truck doors, or with any other items suspended by a cable, as apparent to a person skilled in the art. For this reason, the expressions "garage door" or "garage doors" should not be taken as to limit the scope of the present invention and include all other kinds of doors or items with which the device may be useful.

A garage door is usually connected to an overhead counterbalancing mechanism that provides a counterbalancing force in order to lower the required force to open the door and facilitate its closing. The garage door is connected to the counterbalancing mechanism by means of two cables, one at the right and one at the left. The cables are usually made of steel. The lower free end of each cable is attached at the bottom of the door.

If, for any reason, one of the cables breaks or if an element holding the cable has a failure, the garage door should be immediately stopped where it is and maintained in that position until the necessary reparations and inspections are made. It was thus desired to have a device incorporating a braking system capable of stopping the garage door and holding it in place in case of a cable failure.

FIG. 1 is a perspective view of an example of a cable failure device (10) according to the present invention. The illustrated device (10) is to be located at the bottom of the garage door, more specifically at the right-hand side thereof when viewed from the inside. A left-hand side version of the device (10) would simply be a mirror image of what is shown in FIG. 1.

In this embodiment, the device (10) comprises three main parts, all of which are supported by a bracket (12) that is provided with holes in which screws or bolts can be inserted to connect it to the garage door.

5 The first main part of the device (10) is a roller (14) that is to be engaged in the side rail (not shown) and is similar to a regular roller.

The second main part is a connection element (16) to which the free end of the cable is attached. It comprises a hook (18) connected to a flange (20), itself connected to the bracket (12).

10 The third and most important part of the device (10) is the brake assembly (30). It comprises a U-shaped casing (32), a transversal axle (34), a circular brake pad (36) eccentrically mounted around the axle (34) and located on the side of the casing (32), a torsion spring (38) coaxially mounted around the axle (34), a trigger plate (40) rigidly mounted around the axle (34), an arm (42) pivotally connected to the casing (32) and a cable guide (44).

15 FIG. 2 is an enlarged view of the trigger plate (40) and the arm (42).

FIGS. 3 and 4 are two other perspective views of the device (10).

20 Once the cable (50) is in place, the free end of the cable (50) is attached to the hook (18). The cable (50) passes through the casing (32) and over a first curved portion of the arm (42). The cable guide (44) allows the cable (50) to go under the device (10) and then towards the overhead counterbalancing system (not shown). The torsion spring (38) is pre-loaded to bias the trigger plate (40) against a second curved portion of the arm (42). The device (10) is designed so that the arm (42) is maintained in position as long as there is a tension in the cable (50) to prevent the axle (34), and thus the brake pad (36), from rotating. This is the normal position.

25 If a failure occurs in the cable (50) or in any element holding the cable (50), the tension in the cable (50) will be significantly reduced. As a result, the arm (42) is no longer prevented from pivoting under the biasing force exerted by the torsion

spring (38). The trigger plate (40) pushes on the arm (42) and the axle (34) pivots, bringing the brake pad (36) in contact with the side surface of the adjacent rail. Yet, the pivot axis of the eccentric brake pad (36) is at the bottom thereof and the rotation caused by the torsion spring (38) is away from the garage door and then
5 towards the bottom. The brake pad (36) will eventually reach the side surface of the adjacent rail.

Preferably, the outer surface of the brake pad (36) is knurled and made of a material having a relatively high coefficient of friction so that a strong friction engagement will happen between the side surface of the rail and the brake pad
10 (38).

As soon as the brake pad (36) touches the side surface of the rail, it starts to roll thereon. However, the design of the device (10) is such that there is not enough clearance to allow a complete rotation of the brake pad (38). The brake pad (38) will then be jammed between the rail and the axle (34), preventing the garage door
15 from moving because of the friction between the rail and the outer surface thereof. All this occurs in a very short period of time.

The present invention is an improvement over previous cable failure brakes, such as the one illustrated in FIG. 5. For instance, there is no lever projecting from the device (10) of the present invention, compared with the device in FIG. 5 that uses
20 a projecting lever (100). Further, the prior art device shown in FIG. 5 needs a reinforcement plate (102) which is not required in the device (10) according to the present invention.

The present invention may be used with new garage doors or existing garage doors.

25 Although the present invention has been described in detail herein and illustrated in the accompanying figures, it is to be understood that it is not strictly limited to what is in the description and in the figures. Various changes and modifications may be effected without departing from the scope or spirit of the present invention.

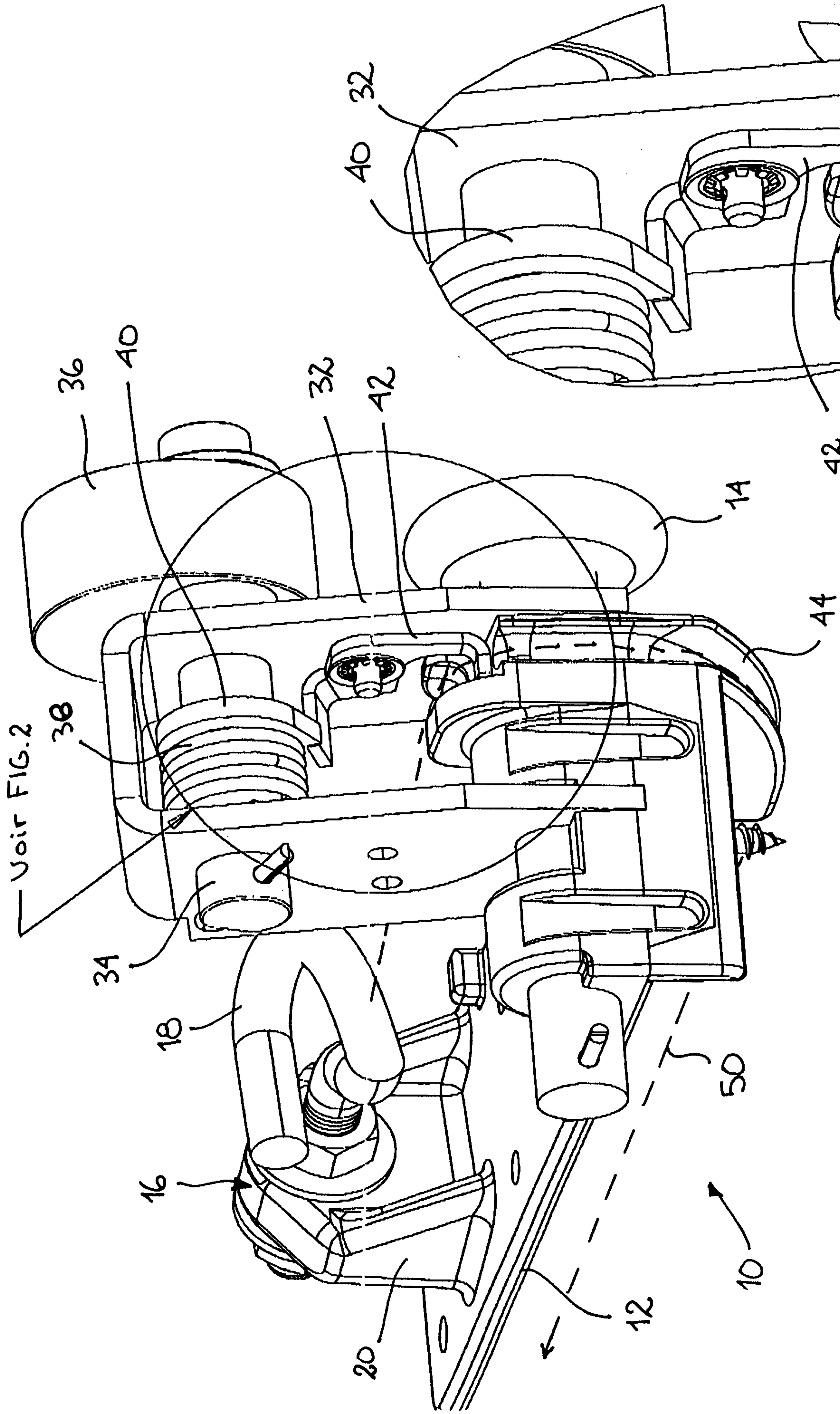


FIG. 1

FIG. 2

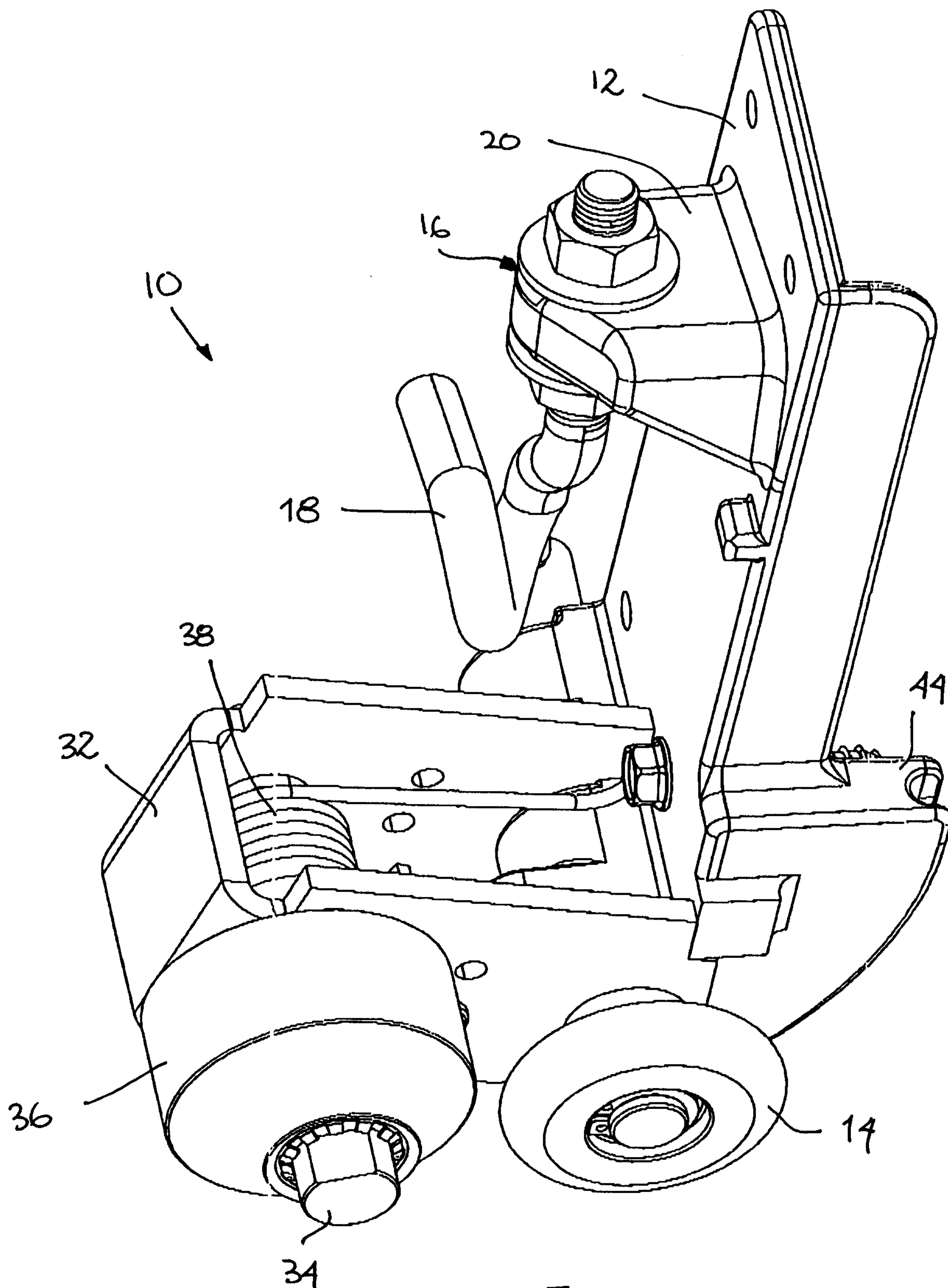


FIG. 3

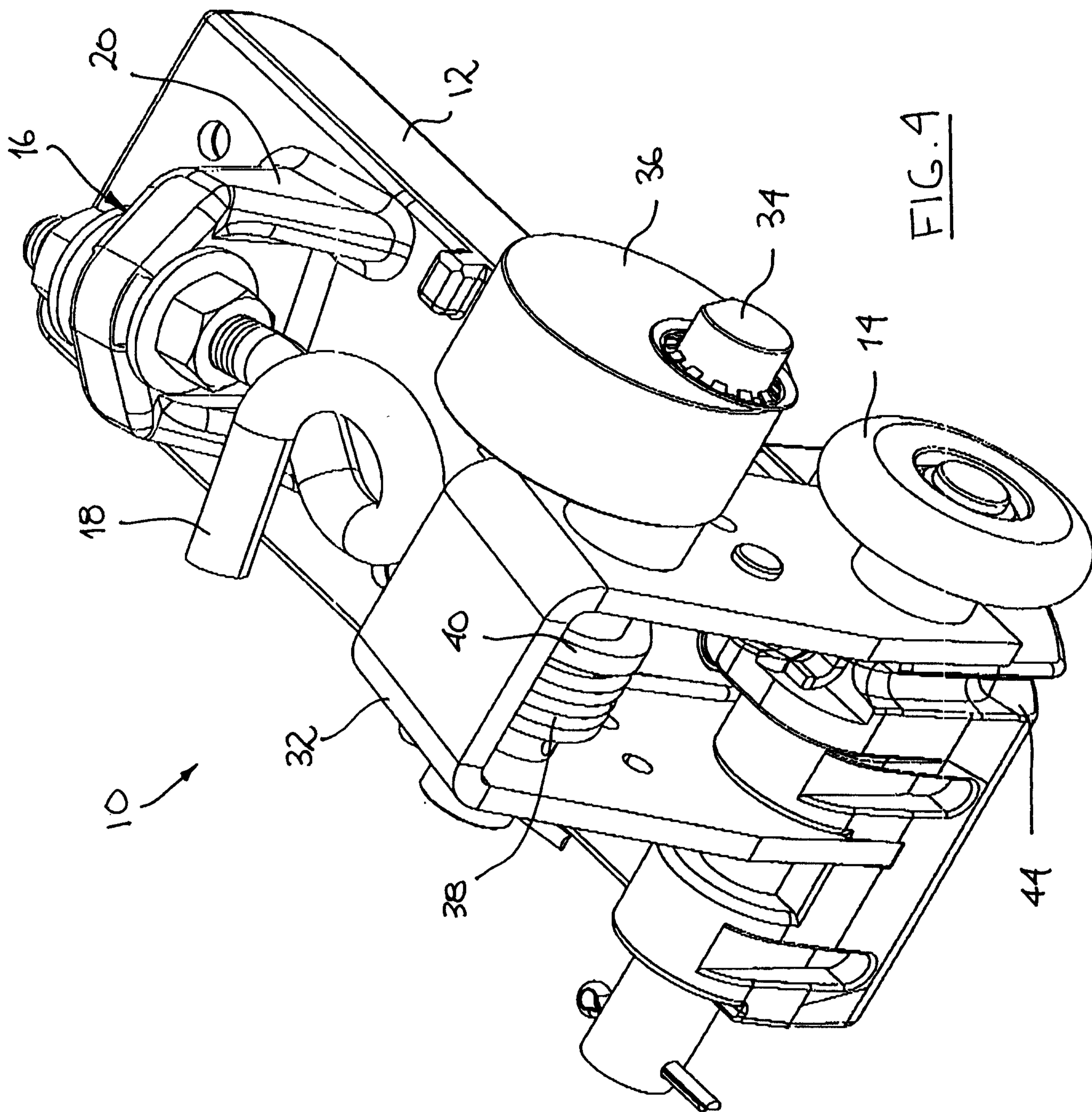


FIG. 4

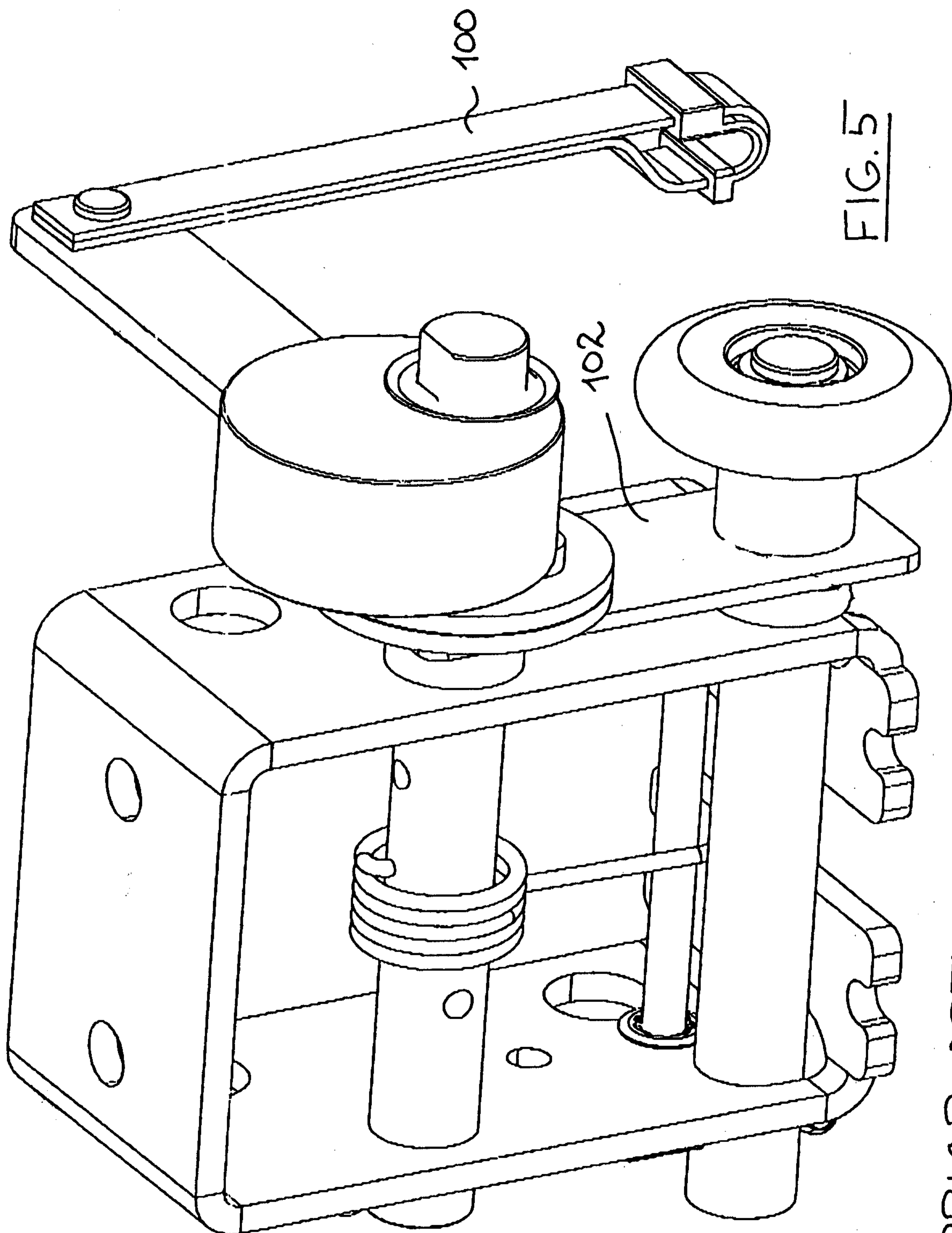


FIG. 5

PRIOR ART

