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(54) **Vehicle jacks.**

(57) A vehicle jack comprises a leg 20 provided with a foot 22 at its lower end, and an arm 24 pivotally mounted on the leg 20 with a load-engageable member 26 at its upper end. A screw and nut arrangement moves the arm 24 relative to the leg 20 for raising and lowering the load-engageable member 26. The foot 27 has a supporting surface including a pair of relatively angled surface portions. A first surface portion 34 supports the jack in a setting up position, and, during lift, the jack rolls to a position of support by the second surface portion 36. A ground-engageable base 38 is provided and the supporting surface is in rolling contact with the base 38. Means is provided to maintain a predetermined location of the foot 22 on the base 38. A pin 40 may be held by brackets 46 on the base 38, and the leg 20 is pivotally mounted on the pin 40.

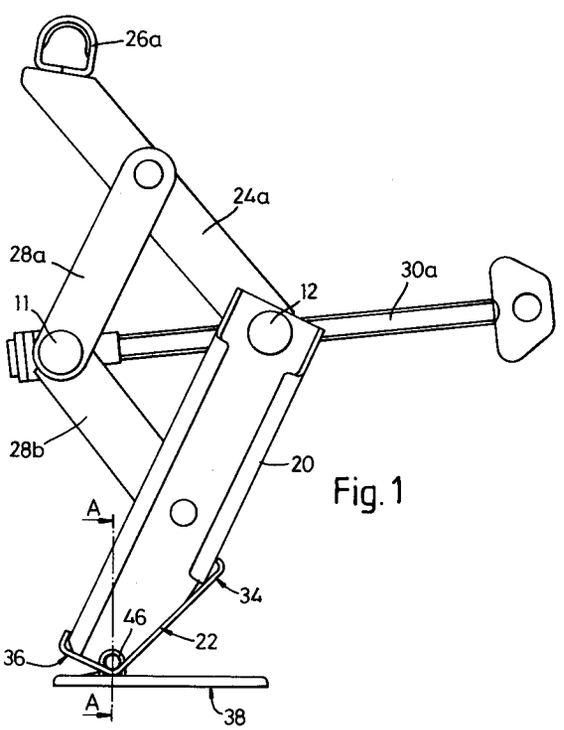

Fig. 1

EP 0 516 314 A2

This invention relates to vehicle jacks.

Jacks of both the scissor-type and the y-form type are well known.

GB-A- 1011933 describes a scissor-type jack comprising a pair of legs, whereby one leg carries a load support member at its upper end and the other leg has an angled foot at its lower end, and the two legs are pivotally joined mid-way along their lengths. A screw is mounted between two adjacent ends of the legs.

GB-A-2053846 describes a y-form type jack comprising an arm pivoted on a leg and an actuator screw connected between the arm and the leg. The leg comprises two elongate plates formed at its longitudinal edges, and the arm is pivoted between the plates. The plates are received in a foot and are welded thereto.

However, in neither type of jack is the foot suitably stable. In the use of both types of jack, a vehicle moves angularly during lift and puts side-load on the jack, which can cause the jack to slide. A further problem is that it is not easy to locate the jack in the correct setting up position. On soft ground, the foot is prone to sink into the ground, thereby causing the same problems.

DE-U-8522952 (US-A-4765595) purports to provide an additional support stay to locate the jack at the start of a lifting operation. However, the design of this jack is such that the entire weight of the vehicle is passed through a pin welded onto the surface of the foot adjacent to the support stay. This provides a weak point under a side load, and, therefore, this construction does not solve the problem adequately. The same problem is met with EP-A-0232836.

DE-U-9005572.1 also discloses a jack in which the leg is pivotally mounted by a pivot pin on a base. At the start of a jacking operation, the lower end of the leg may contact the base. When a force is exerted on the jack, in use, however, the leg pivots out of contact with the base, with no rolling movement from one support surface to another. The entire force on the jack is carried by the pivot pin. DE-U-9015483.5 discloses a similar arrangement. Both of these disclosures, therefore, suffer the same problem as DE-U-8522952.

The disclosures of DE-A-3608003, DE-U-8702589.2, US-A-4015825 and FR-A-623956 also suffer from the same problem.

An object of the present invention is to overcome this problem.

The precharacterising part of Claim 1 is based on GB A-2053846 as the closest prior art document. This provides a vehicle jack comprising an elongate leg provided with a foot at one end, an arm supported by the leg and pivotally movable relative thereto, a load-engageable member carried by the arm, and a screw and nut arrangement for moving the arm relative to the leg for raising and lowering the load-engageable member, the foot having a supporting surface including a pair of relatively angled surface portions, a first of which supports the jack in a setting up position, the jack being capable of rolling on the supporting surface during lift to a position of support by the second of said surface portions.

The present invention is characterised by a ground-engageable base and in that said rolling movement is effected with the supporting surface in rolling contact with the base, and further characterised by locating means maintaining a predetermined location of the foot on the base.

Preferably, an end of the leg adjoining the foot is adapted to receive a pin therein, and fastening means attach the pin to the base, so as to define said means.

The fastening means may comprise horse-shoe shaped brackets adapted to pass around the pin and into the base.

There now follows a detailed description, to be read with reference to the accompanying drawings, of a vehicle jack embodying the invention.

In the accompanying drawings:

Figure 1 is a side view of a scissor-type jack embodying the invention, shown in its operative position;

Figure 2 is a cross-section along the line A--A of Figure 1;

Figure 3 is a side view of the jack of Figure 1, shown in its retracted state;

Figure 4 is a side view of a Y-form type of jack, shown in its operative state; and

Figure 5 is an exploded perspective view of the foot and base construction of the jack of Figure 1, or Figure 4.

Referring to Figures 1 to 3, the scissor-type jack comprises a leg 20 with a foot 22 at its lower end, and a main arm 24a articulated on a horizontal axis and presenting at its free end a load support member 26a. The leg 20 and arm 24a are pivotally interconnected mid-way along their lengths by a linkage comprising two articulated support arms 28a, 29a. A screw 30a is pivotally mounted at the articulation joint 11 between the support arms and screw engages in a nut 12 at the articulation joint between the main arm 24a and the leg 20. The leg 20 comprises a pair of elongated, parallel, spaced channel members 20a, 20b and the main arm 24a pivots between the members. The channel members are welded to the foot 22.

With reference to Figure 4, the jack shown comprises an arm 24b pivoted on a leg 20 to define a y-shape, with an actuator screw 30b connected between a pivot point 11b and a nut 12b on the arm 24b and the leg 20 respectively. The upper end of the arm 24b carries a load support member

26b.

The foot 22 has a supporting surface including a pair of relatively angled surface portions. A first angled surface portion 34 supports the jack in a setting up position (see Figure 3). The jack rolls on the supporting surface during lift to a position of support by the second angled surface portion 36.

Each type of jack further comprises a ground-engageable base 38. The base has a large area, relative to the foot, in contact with the ground. The angled surface portions 34,36 of the foot have rolling contact with the large area top surface of the base 38, means being provided to maintain location of the foot 22 on the base 38.

With reference to Figures 4 to 6 the mechanism by which the supporting surface remains attached in rolling contact with the base 38 is as follows. A pin 40 is located at the end of the leg 20 adjacent to the foot 22 and is received in the bend of the foot between the angled surface portions 34, 36. The channel members 20a,20b have arcuate cutout portions 42, which co-operate with the foot to define apertures which receive the pin 40. The pin is substantially the same length as the foot, extending along the foot from one side to the other. The pin 40 may also be tack welded to the foot 22 to prevent it from coming adrift. Fastening means attach the pin 40 to the base 38, thereby locating the foot 22 on the base 38.

A pair of holes 44 is provided in the second angled surface 36 of the foot 22 to receive fastening means, in which pass around the pin 40, through the holes in the second angles surface portion 36 of the foot, to attach the pin 40 to the base. The fastening means comprise horseshoe shaped brackets 46 which receive the pin 40 and are attached to the base 38. The legs of each bracket 46 terminate in reduced width portions 50 defining shoulders. The reduced width portions are received in sockets 48 in the base and are turned under to secure the brackets to the base (see Figure 5). The shoulders, defined by the reduced width portions 50, seat on the top of the base.

A third hole 52 in the second angled surface portion 36 of the foot 22 is provided approximately mid-way between said pair of holes 44 and receives a torsion spring 54 located around the pin. The torsion spring 54 serves to resist the rolling movement of the foot from the first angled surface portion 34, which supports the jack in a setting up position, onto the second angled surface portion 36, which supports the jack during lift, thereby to dampen movement of the foot relative to the base and to bias the foot to its setting up position.

The ground-engageable base 38 provides good stability for the jacks by providing a large contact area with the ground. The base prevents slippage of the jack in use, when side-load is put on the jack during lift, and prevents sinkage of the jack into soft ground. The large area base 38 also makes it easier to locate the jack properly to the correct setting up position.

It is important for stability that the foot has rolling contact with the base, but is well anchored to the base. The connection of the foot with the base is such that side load on the jack does not pass through the pin, but through the brackets 46. The pin serves only to locate the foot on the base, and no load is passed through the pin under side forces on the jack. The side forces are taken by the brackets, providing a stable and strong construction.

Claims

1. A vehicle jack comprising an elongate leg (20) provided with a foot (22) at one end, an arm (24a,24b) supported by the leg and pivotally movable relative thereto, a load-engageable member (26,26b) carried by the arm, and a screw (30a,30b) and nut (12) arrangement for moving the arm relative to the leg for raising and lowering the load-engageable member, the foot (22) having a supporting surface including a pair of relatively angled surface portions (34,36), a first of which (34) supports the jack in a setting up position, the jack being capable of rolling on the supporting surface during lift to a position of support by the second (36) of said surface portions, characterised by a ground-engageable base (38), and in that said rolling movement is effected with the supporting surface (34,36) in rolling contact with the base, and further characterised by locating means (40) maintaining a predetermined location of the foot (22) on the base (38).

2. A vehicle jack according to claim 1 wherein the locating means comprises a pin (40) held by fastening means (46) on the base (38), and the leg (20) is pivotally mounted on the pin.

3. A vehicle jack according to claim 2 wherein the fastening means comprises horse-shoe shaped brackets (46) which pass around the pin (40) and are secured to the base (38).

4. A vehicle jack according to any one of the preceding claims wherein the pin (40) is tack welded to the foot (22).

5. A vehicle jack according to any one of the preceding claims wherein a torsion spring (54) is located around the pin (40) to bias the foot (22) to the setting up position.

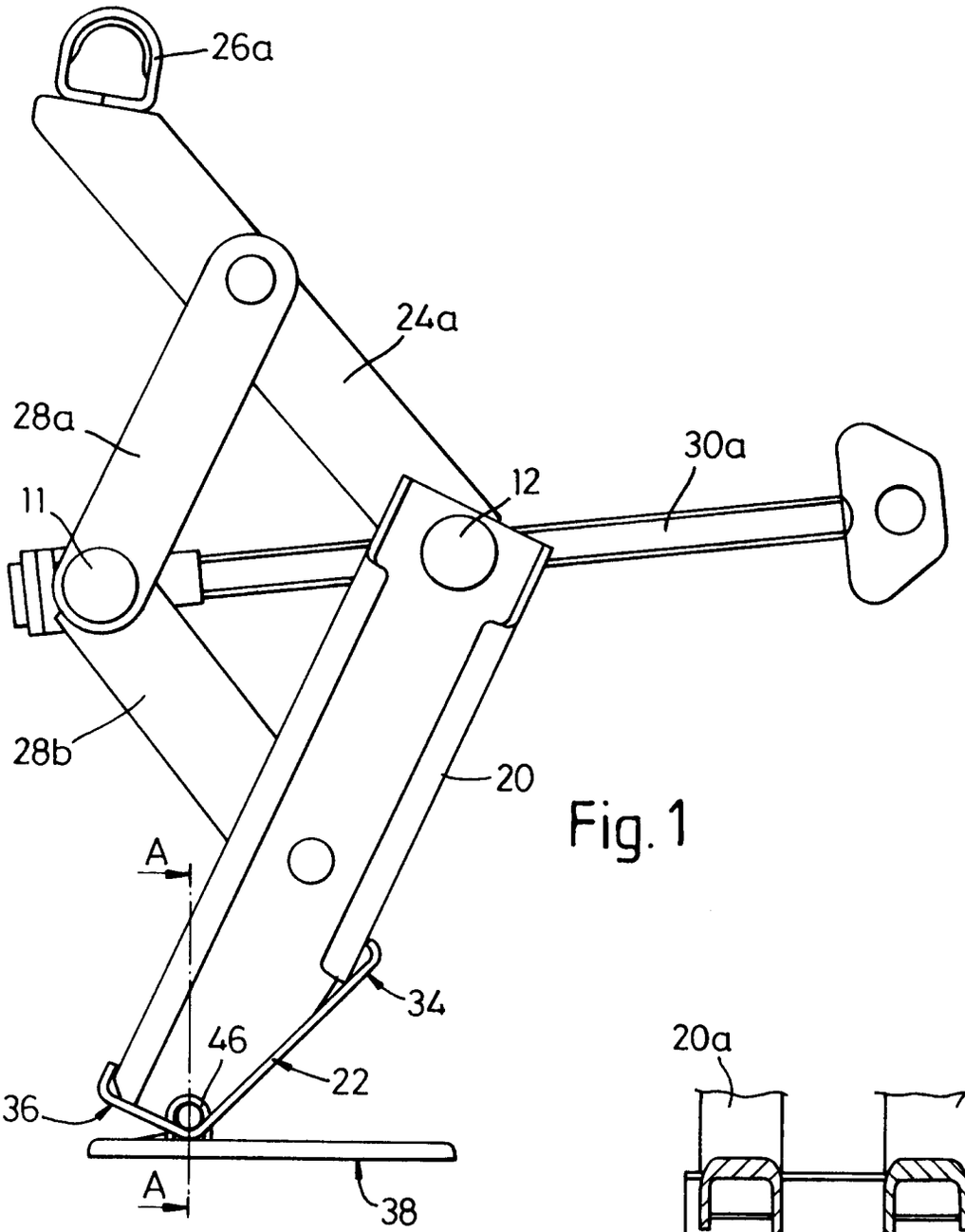

Fig. 1

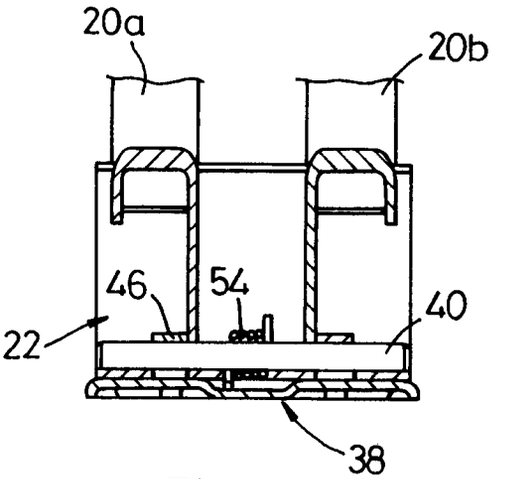

Fig. 2

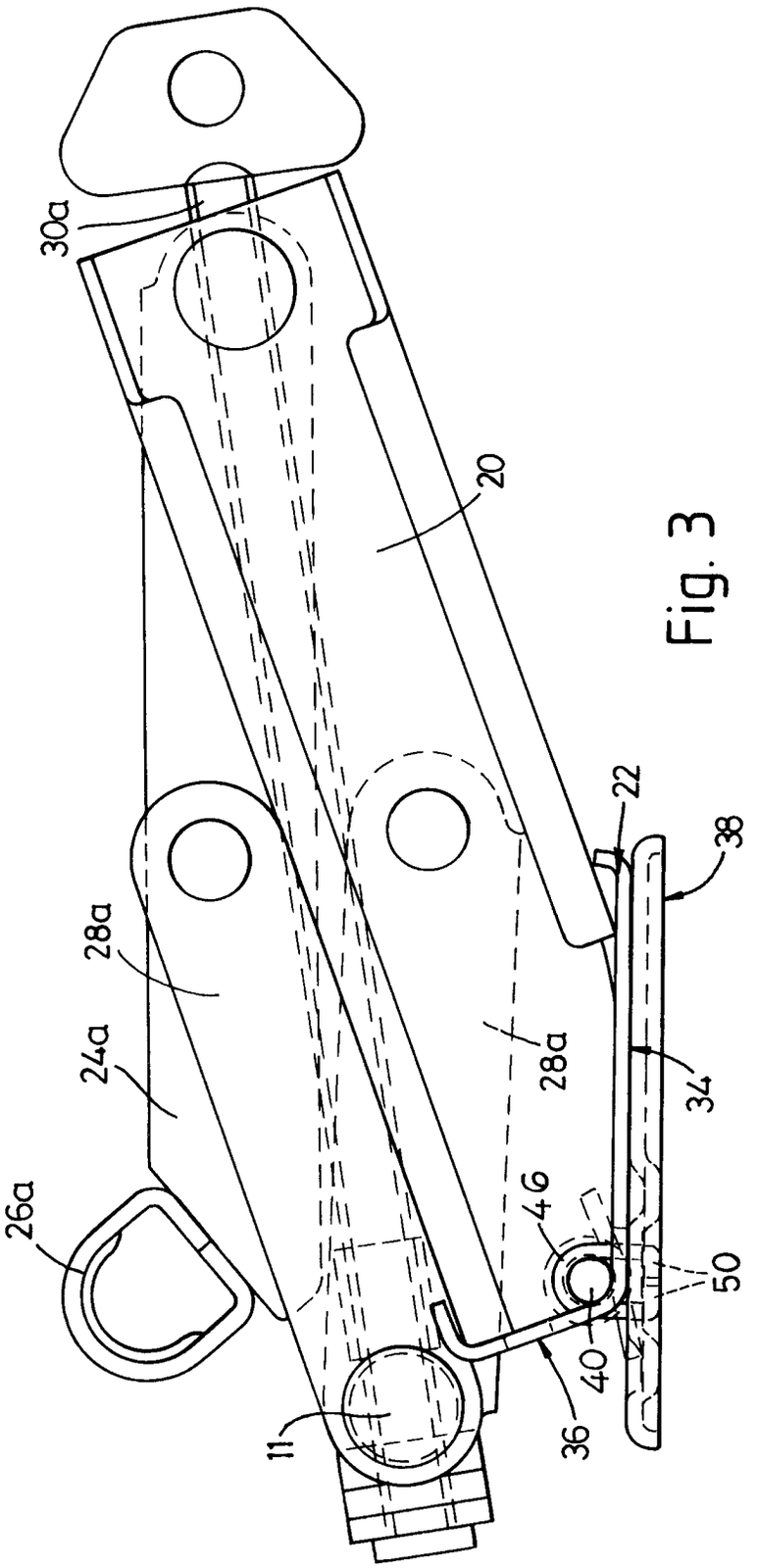

Fig. 3

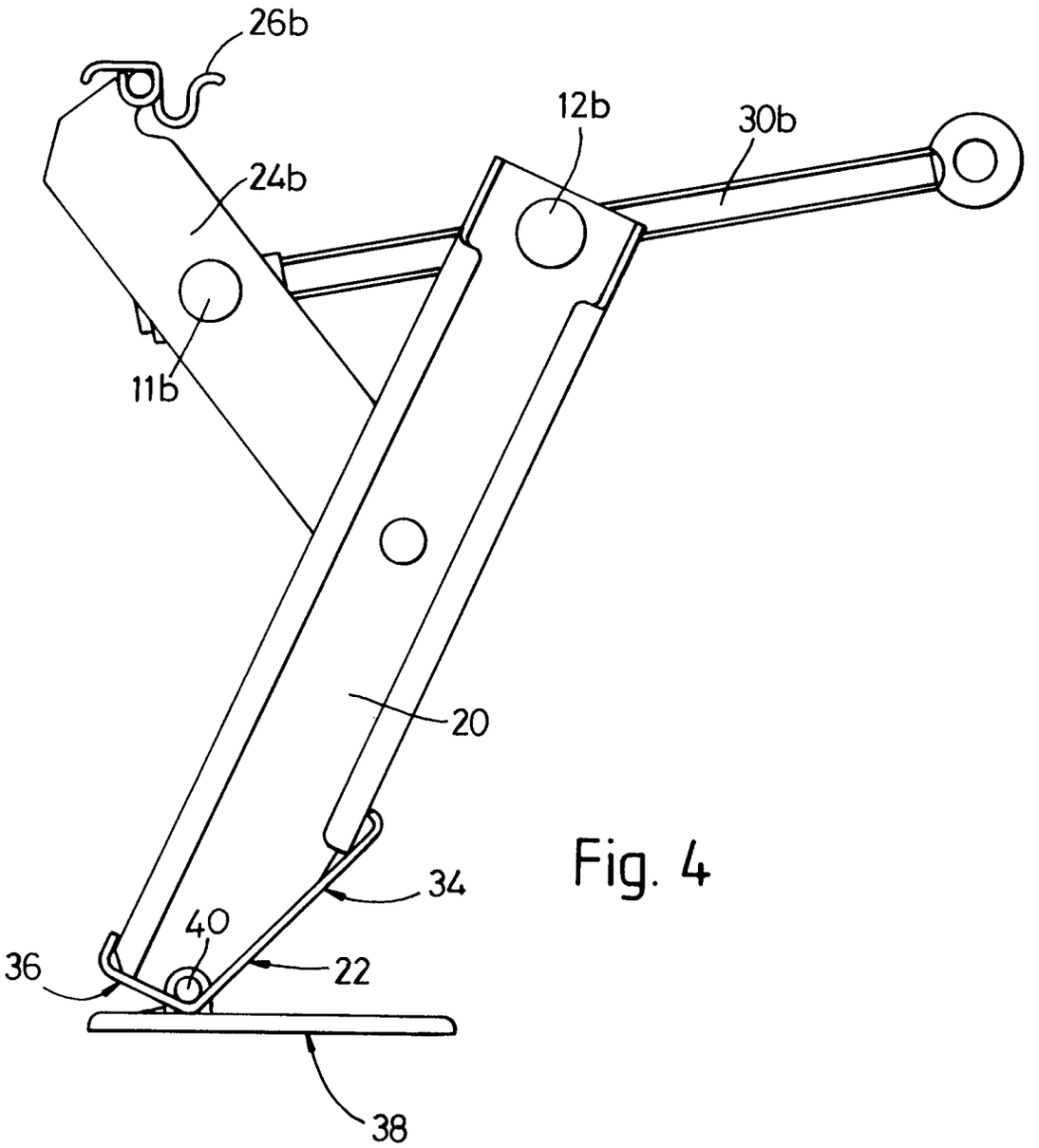

Fig. 4

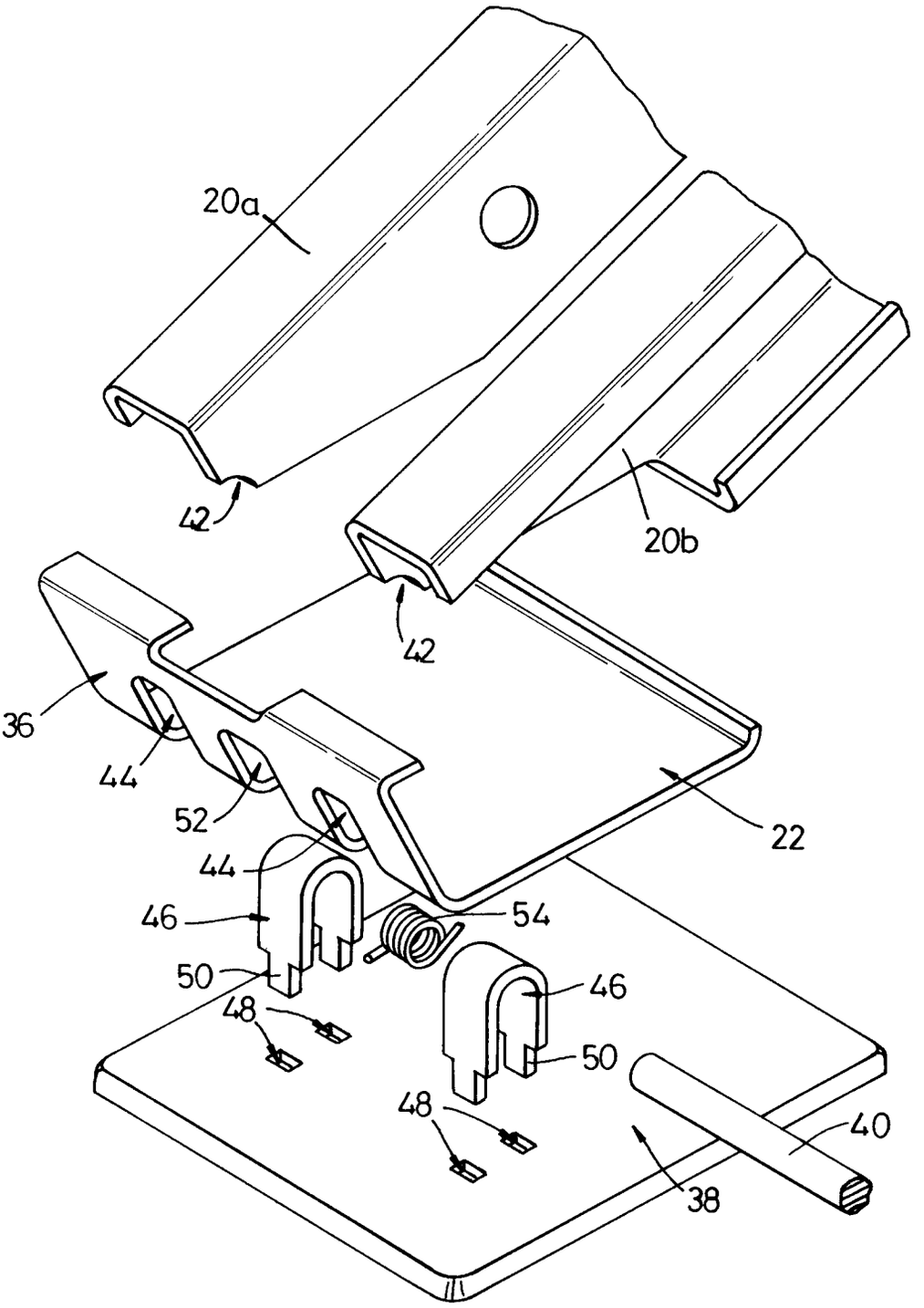

Fig. 5