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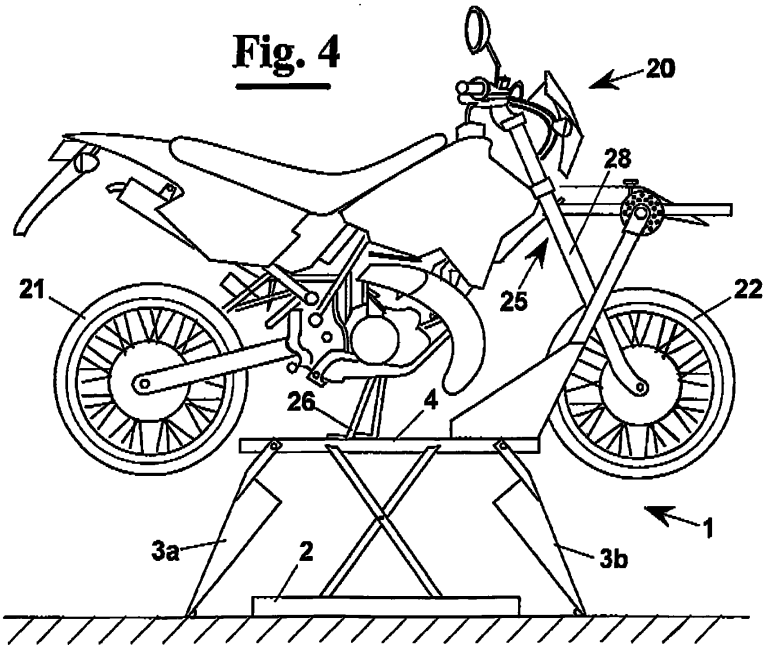
(54) Motorcycle lift

(57) Apparatus (1) for motorcycle lifting (20) comprising a support plane (5) having a central portion (4) and two ends (3a and 3b) hinged to said central portion, said ends bearing the wheels (21, 22) of the motorcycle (20). The support plane (5) is then associated to a device (2) that allows its lifting/lowering from ground for example by a hydraulic cylinder. The apparatus (1) is, furthermore, equipped with a support structure (10) integral to the support plane (5), having a pin (15) for engaging with a point (25) of the frame of the motorcycle (20) arranged near the handlebar. In this way, the motorcycle (20) is held by the apparatus (1) at the handlebar (28) and at another point, for example the central part of the frame, which rests on a removable support (36), for example a special jack, or on the stand (26) of the motorcycle same. The support structure (10) comprises a first upright (11a) and a second upright (11b) connected to the support plane (5) at opposite sides. Between the uprights (11a) and (11b) a cross member (16) is arranged adapted to rotate with respect to them about an axis of rotation (40). The pin (15) is then connected to the cross member (16) by a rod (12) adapted to translate orthogonally to the cross member (16). The pin (15) provided at the end of the rod (12) is put into a special hole made don the short tube of the handlebar of the motorcycle -

Fig. 4



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Description

Field of the invention

[0001] The present invention relates to a motorcycle lift of the type used in the garages for the maintenance and repair of mechanical parts of motorcycles.

Description of the prior art

[0002] As well known, in garages for repair and maintenance of motorcycles suitable lifts are normally used that raise the vehicle from ground level to let an operator to repair or to parts of the vehicle. In particular, the lifts normally used provide a platform that is raised from ground by at least one hydraulic cylinder that operates a frame consisting of stiff elements. The motorcycle is arranged on its stand on the platform, which provides an apparatus for locking a wheel to ensure a suitable steadiness in order to let the operator to work safely. In this case the platform extends for all the length of the motorcycle and for this reason it cannot be used for replacing worn tyres, but only for repairing other mechanical parts such as the transmission system, the motor, etc., which can be reached easily by the operator.

[0003] For replacing the tyres other types of lifts are required, having a platform that can be arranged between the front wheel and the rear wheel, which are left free. Normally, in this case the motorcycle rests on the platform at the motor. This causes not only an unsteadiness of the position of the motorcycle owing to the not perfect planarity of the part of the motor that rests on the platform, but also a danger of damages to the motor same during the work of the operator. Furthermore, such lifts cannot be used with heavy motorcycles.

Summary of the invention

[0004] It is therefore a feature of the invention to provide an motorcycle lift apparatus, which are adapted to raise the vehicles in order to leave free the wheels for the change of the tyres.

[0005] It is also a feature of the invention to provide an apparatus for motorcycle lifting that allows also raising the vehicle in order to carry out repair and maintenance like in traditional motorcycle lifts and at the same time at the choice of an operator allows releasing the wheels for their disassembly/reassembly.

[0006] It is a further feature of the invention to provide such an apparatus that is structurally easy and cheap with respect to lift apparatus of prior art.

[0007] These and other features are accomplished with one exemplary apparatus for motorcycle lifting, according to the invention, comprising:

- lifting means movable between a lowered position and a raised position,
- a support plane for motorcycles fixed to said lifting means, said support plane having a central portion and two ends hinged to said central portion, said ends bearing the wheels of the motorcycle when said lifting means are in lowered position and being adapted to rotate towards below releasing the wheels when said lifting means are in raised position,
- a support structure integral to the support plane and provided with means for engaging with the motorcycle at least at one point of the frame.

[0008] In particular, a point at which the motorcycle is constrained by the means for engaging is located near the motorcycle handlebar.

[0009] Advantageously, the means for engaging provide a pin adapted to enter in a special hole normally present in the short tube of the motorcycle handlebar. In this case the support structure engages the motorcycle at the steering tube and is held by the support plane at another point of the frame, for example arranged on a removable support, or on the stand. When the end sides of the support plane are rotated after lifting the support plane, the wheels of the motorcycle are disengaged by the apparatus and then can be easily reached by an operator that can replace them, change the tyres, or carry out a routine check.

[0010] Preferably, the support structure provides:

- a first and a second upright connected to said support plane at opposite sides,
- a cross member arranged between the first and the second upright, the cross member being adapted to rotate about an axis of rotation,
- a rod operatively connected to said cross member and adapted to translate in a direction orthogonal to said cross member, said rod being equipped, at the free end, with said means for engaging,
- means for blocking the means for engaging at a predetermined position.

[0011] In an exemplary embodiment of the invention, the cross member can, furthermore, be arranged sliding vertically, through said uprights that are made of two portions coupled telescopically, in order to be set at different heights with respect to the support plane. This gives a further degree of freedom to the means for engaging with respect to the support plane that assist further the correct arrangement of the motorcycle.

[0012] Advantageously, the means for blocking the means for engaging at a predetermined position provide:

- means for blocking the cross member at a measured angular position with respect to the uprights,
- means for blocking the rod in a predetermined displaced position with respect to the cross member.

[0013] In other words the means for engaging have three degrees of freedom, according to height, rotation, and translation, with respect to the support plane. This

allows to adapt easily the apparatus to a variety of types of motorcycles and gives therefore a high flexibility to the apparatus same. In particular, whichever position of the hole of the short tube of the motorcycle, it is always possible to put the pin in the hole by means of suitable combination of translational and rotational motion of the means for engaging.

[0014] The means for blocking the cross member in a measured angular position can, for example, provide:

- at least one disc integral to the cross member having a plurality of holes corresponding to different angular positions of the means for engaging,
- a pin adapted to enter in one of the holes of the disc and in a hole of the uprights for stopping the cross member in a measured angular position.

[0015] Advantageously, furthermore, auxiliary constraint means are provided connected to the support plane and adapted to block the motorcycle at a second point, for example at a fork near the motor.

[0016] In particular, the auxiliary constraint means can comprise:

- at least one bracket hinged to the support plane,
- an arm arranged telescopically in the bracket so that it is movable horizontally towards/away from the motorcycle, the arm being provided at the free end of a couple of U-shaped supports adapted to support the frame of the motorcycle at the second point, in particular, the fork of the rear wheel,
- lock means for fixing the bracket in a measured angular position with respect to the support plane.

[0017] The auxiliary constraint means can be, advantageously, used if the motorcycle is not equipped with a suitable stand or if it has the fork not easily accessible by the auxiliary means for engaging.

Brief description of the drawings

[0018] The invention will now shown with the following description of an exemplary embodiment thereof, exemplifying but not limitative, with reference to the attached drawings wherein:

- Figure 1 shows an elevational side view of a first exemplary embodiment of the apparatus for motorcycle lifting, according to the invention,
- Figures from 2 to 5 show an elevational side view of four possible configurations in which it is possible to arrange the apparatus of figure 1 in a working operation,
- Figure 6 shows in detail a top plan view of the support structure mounted on the apparatus of figure 1,
- Figures 7 and 8 show in two perspective views, respectively rear view and front view, the apparatus of figure 1,
- Figure 9 shows in an elevational side view an exemplary embodiment of the motorcycle lift apparatus alternative to that of figure 1,
- Figure 10 shows a perspective view of the apparatus of figure 9 illustrating its main parts,
- Figure 11 shows in an elevational side view the apparatus of figure 9 in operative conditions,
- Figures 12 and 13 show respectively a perspective view and an elevational side view of some details of the support structure of the apparatus of figure 1 and of figure 9.

Description of preferred exemplary embodiments.

[0019] With reference to figure 1, a first exemplary embodiment of an apparatus 1 for lifting a motorcycle 20, according to the invention, provides a support plane 5 on which the motorcycle 20 is arranged for revision. The support plane 5 has a central portion 4 and two ends 3a and 3b hinged to said central portion, said ends bearing the wheels 21 and 22 of the motorcycle 20 (figure 2). The support plane 5 is then associated to a device 2 that brings about its lifting/lowering from ground, for example by a hydraulic cylinder not shown in the figure. The apparatus 1 is, furthermore, provided with a support structure 10 integral to the support plane 5, having a pin 15 for engaging with a point 25 of the frame of the motorcycle 20 arranged near the handlebar. In this way the motorcycle 20 is held by the apparatus 1 at the handlebar 2 and at another point, for example the central part of the frame, which rests on a removable support 36 (figure 5), for example a special jack, or on the stand 26 of the motorcycle same.

[0020] The support structure 10 comprises a first upright 11a and a second upright 11b connected to the support plane 5 at opposite sides. Between the uprights 11a and 11b a cross member 16 adapted to rotate with respect to them about an axis of rotation 40 (figures 7 and 8). Furthermore, the cross member 16 can slide longitudinally by arranging the uprights 11 in two portions 11' and 11", which are coupled telescopically in order to be set at different heights with respect to the support plane 5 (figure 12) . The pin 15 is then connected to the cross member 16 by a rod 12 adapted to translate orthogonally to the cross member 16 same. The pin 15 that is provided at the end of the rod 12 is put into a special hole made on the short tube of the steering means of motorcycle. Therefore, the motorcycle 20 rests on the stand 26, or on another support 36, arranged on the central part 4 of the support plane 5 and has the pin 15 engaged with the short tube of the motorcycle handlebar 28. When the support plane 5 is raised, the end sides 3a and 3b, bearing for example wheels 7, move to a rotated position. In this configuration the wheels 21 and 22 are disengaged from the apparatus 1 and the weight of the motorcycle 20 is transferred completely on the pin 15 and on the support, so that the wheels 21 and 22 can be easily reached by an operator for changing the tyres (figure 4).

[0021] To allow an easy introduction in the short tube of the motorcycle handlebar, the pin 15 has three degrees of freedom, one rotational and two translational, with respect to the support plane 5, allowing then adapting the apparatus 1 to a desired type of motorcycle 20. Once pin 15 has been put in the hole of the short tube of the motorcycle handlebar the degrees of freedom are locked in the respective positions. This is easy because the motorcycle still rests on the wheels. The adjustment of the position of the pin is obtained, for example, through a first and a second disc 14a and 14b, which are arranged at the two ends of the cross member 16 and have a plurality of holes 34 that take different angular positions. When the pin 15 is in a predetermined angular position a locking pin 35 is inserted in the corresponding hole 34 of the disc 14, for preventing the cross member 16 from further rotations (figure 12). Similarly, the translational degree of freedom of the pin 15 is blocked, for example acting on a knob 13, by a terminal fastening element 33 that acts on the rod 12 (figure 13). Even the second translational degree of freedom can be blocked by a pin 43, which crosses the fixed portion of the upright 11 and the telescopically movable portion with the relative hub 41 integral to the cross member 16, blocking them in the relative position corresponding to the desired height of the cross member 16 from the support plane 5.

[0022] In figures from 9 to 11 an exemplary embodiment is shown of the invention of the apparatus 1 for lifting motorcycles as above described. In particular, this exemplary embodiment provides auxiliary constraint means 50 comprising a couple of arms 55a and 55b arranged horizontally in a telescopic way in respective brackets 56. These are connected to the support plane 5 at opposite sides and can rotate with respect to it. More in detail, the arms 55 at the free end have two U-shaped supports 61 and 62, that can relatively move towards/away from each other in order to hold between them a portion of the frame of the motorcycle 20, for example an arm of the fork of the rear wheel. The angular position of each bracket 56 is adjusted by means of respective rods 57 hinged at 58 to the support plane 5. Each arm 55 is therefore adapted to rotate and to translate, by sliding in the respective bracket 56, with respect to the motorcycle 20 on the support plane 5. In this way there is a certain freedom of movement through which it is possible to position the arms 55a and 55b with respect to the motorcycle 20. Once achieved the correct position the arms 55a and 55b are locked acting on knobs 53 and 54 (figure 10), causing the U-shaped supports to rotate up to bringing them up to a vertical position where they engage with the rear fork. Raising the support plane 5 the wheels remain suspended and all the load rear of the motorcycle 20 rests on the U-shaped supports and then is transmitted by the means of constraint auxiliary to the support plane 5.

[0023] The foregoing description of a specific embodiment will so fully reveal the invention according to the conceptual point of view, so that others, by applying current knowledge, will be able to modify and/or adapt for various applications such an embodiment without further research and without parting from the invention, and it is therefore to be understood that such adaptations and modifications will have to be considered as equivalent to the specific embodiment. The means and the materials to realise the different functions described herein could have a different nature without, for this reason, departing from the field of the invention. It is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Claims

1. Apparatus for motorcycle lifting **characterised in that** it comprises:

   - lifting means movable between a lowered position and a raised position,
   - a support plane for a motorcycle fixed to said lifting means, said support plane having a central portion and two ends hinged to said central portion, said ends bearing the wheels of said motorcycle when said lifting means are in a lowered position, and being adapted to rotate towards below releasing the wheels when said lifting means are in a raised position,
   - a support structure integral to said support plane and provided with means for engaging with said motorcycle at least at one point of the frame.

2. Apparatus, according to claim 1, wherein said point of said frame at which said motorcycle is engaged is located near the motorcycle handlebar.

3. Apparatus, according to claim 1, wherein said means for engaging provide a pin adapted to enter in a special hole normally present in the short tube of the motorcycle handlebar of said motorcycle, said motorcycle being then held by said support plane at another point of the frame.

4. Apparatus, according to claim 1, wherein said support structure provides:

   - a first and a second upright connected to said support plane at opposite sides,
   - a cross member arranged between said first and said second upright, said cross member being adapted to rotate about an axis of rotation,
   - a rod operatively connected orthogonally to said cross member and adapted to translate in a direction orthogonal to said cross member, said rod being equipped, at the free end, with said means for engaging,
   - means for blocking said means for engaging

at a predetermined position.

5. Apparatus, according to claim 4, wherein said cross member can slide vertically through uprights that are made in two portions coupled telescopically in order to be set at different heights with respect to said support plane.

6. Apparatus, according to claim 4, wherein said means for blocking said means for engaging provide:

- means for blocking said cross member at a measured angular position with respect to said uprights,
- means for blocking said rod at a predetermined displaced position with respect to said cross member.

7. Apparatus, according to claim 6, wherein said means for blocking said cross member in a measured angular position provide:

- at least one disc integral to said cross member having a plurality of holes corresponding to different angular positions of said means for engaging
- a pin adapted to enter in one of said holes of said disc and in a hole of said uprights for stopping said cross member in a measured angular position.

8. Apparatus, according to claim 1, wherein, furthermore, auxiliary constraint means are provided connected to said support plane and adapted to block said motorcycle at its second point.

9. Apparatus, according to claim 8, wherein said auxiliary constraint means comprise:

- at least one bracket hinged to said support plane,
- an arm arranged telescopically in said bracket so that it is movable horizontally towards/away from said motorcycle, said arm being provided at the free end of a couple of U-shaped supports adapted to support said frame of said motorcycle at said second point, in particular belonging to the fork of the rear wheel,
- lock means for fixing said bracket in a measured angular position with respect to said support plane.

Fig. 1

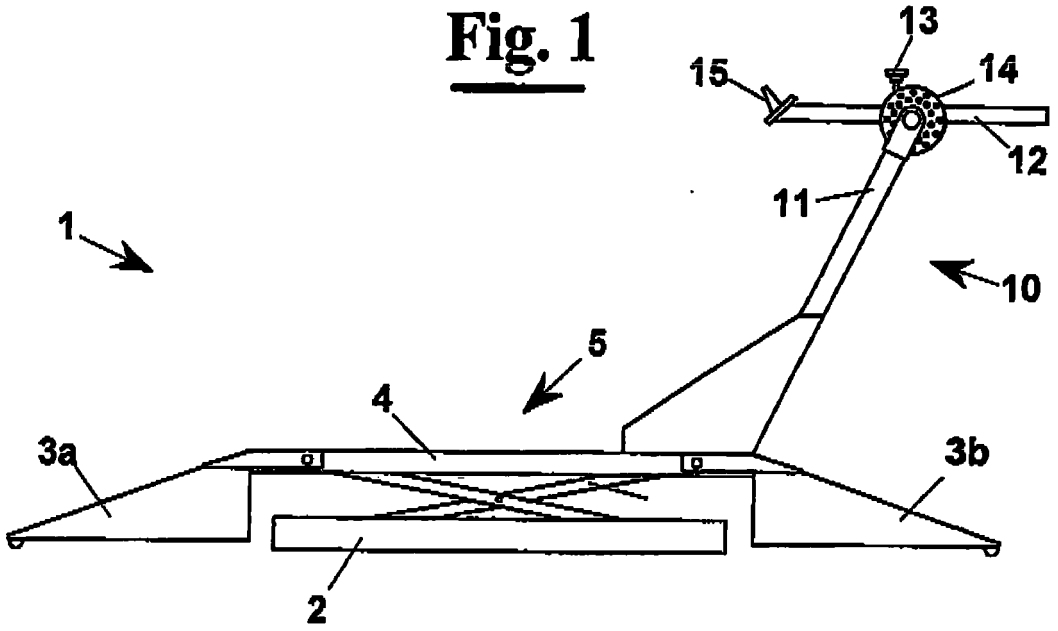


Fig. 2

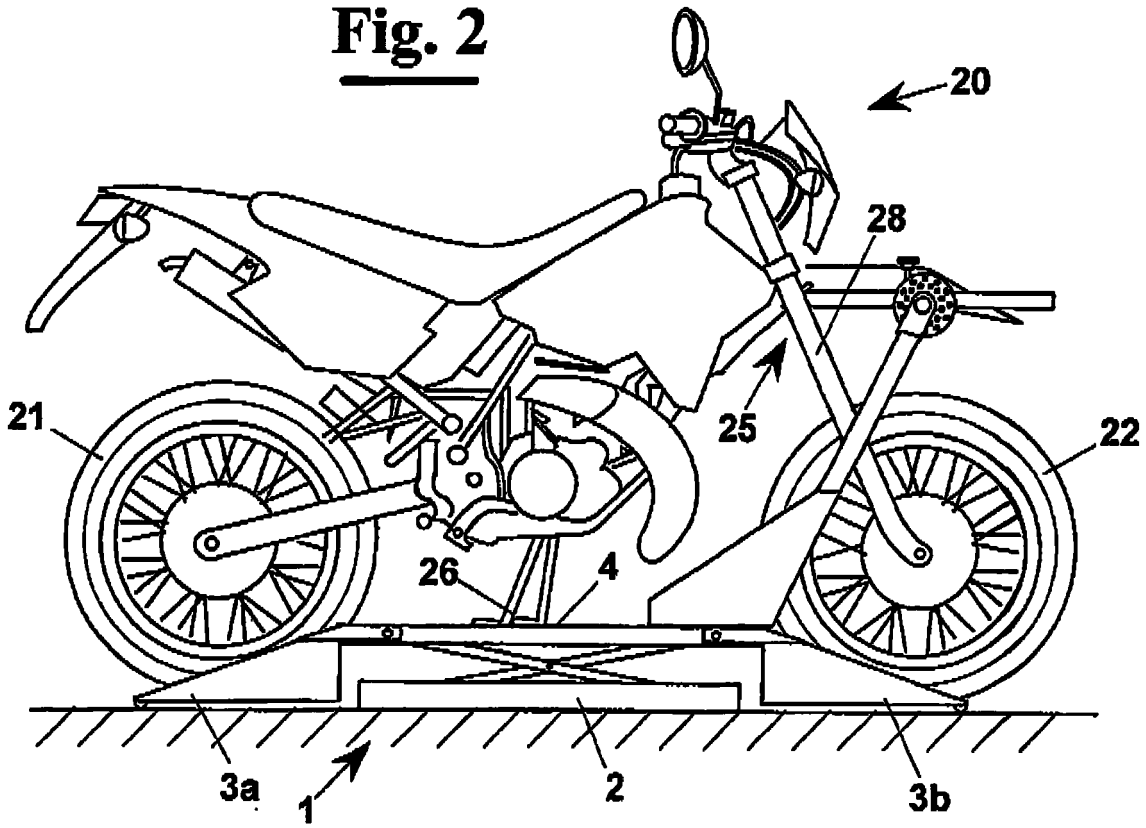


Fig. 3

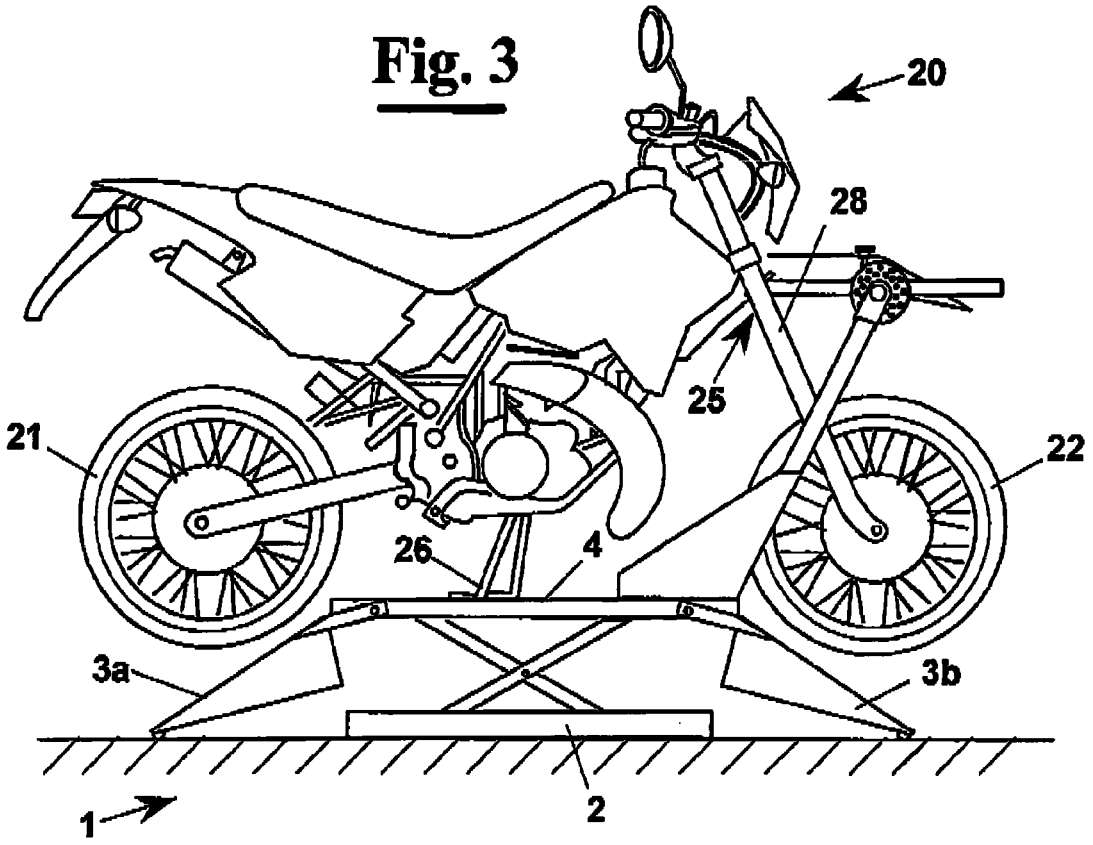


Fig. 4

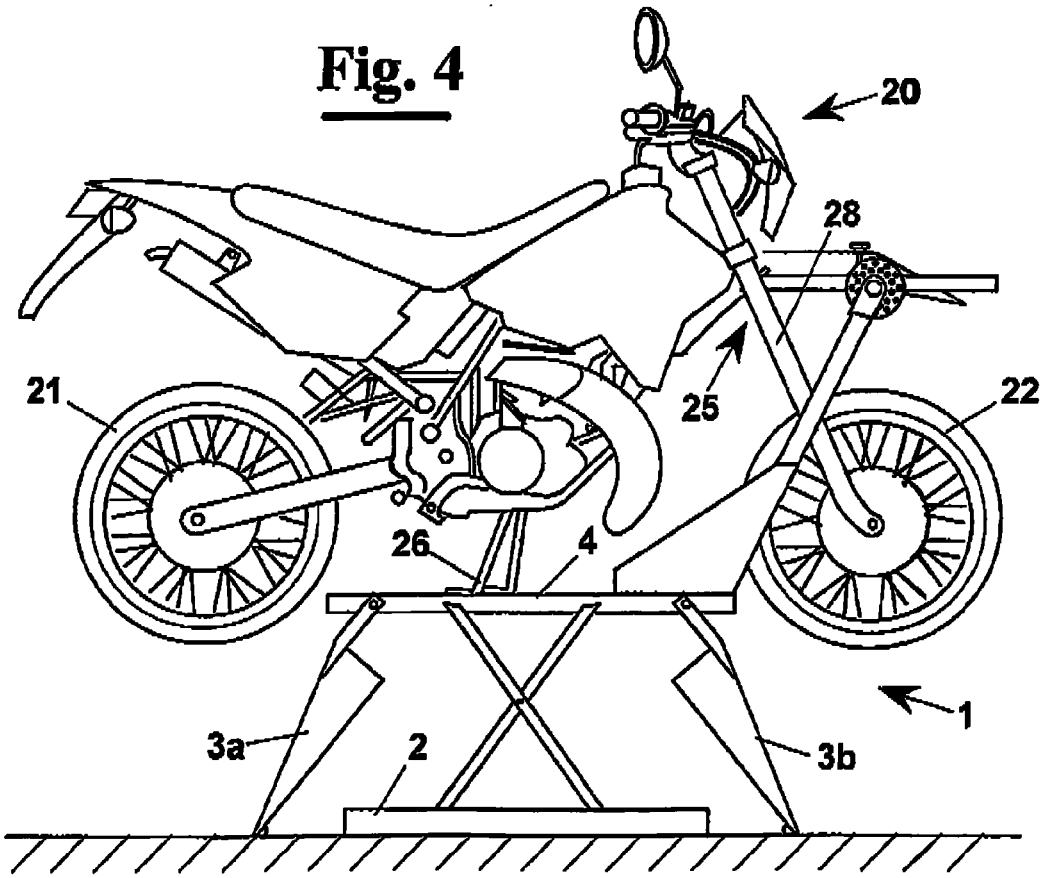


Fig. 5

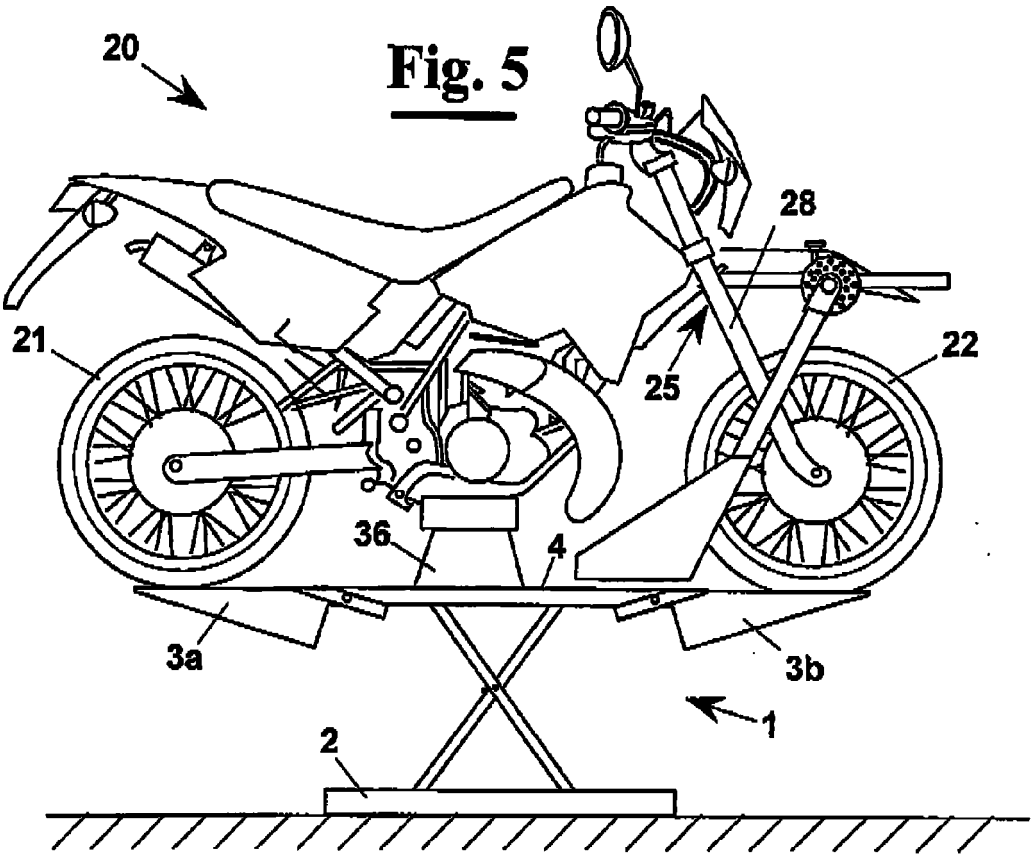


Fig. 6

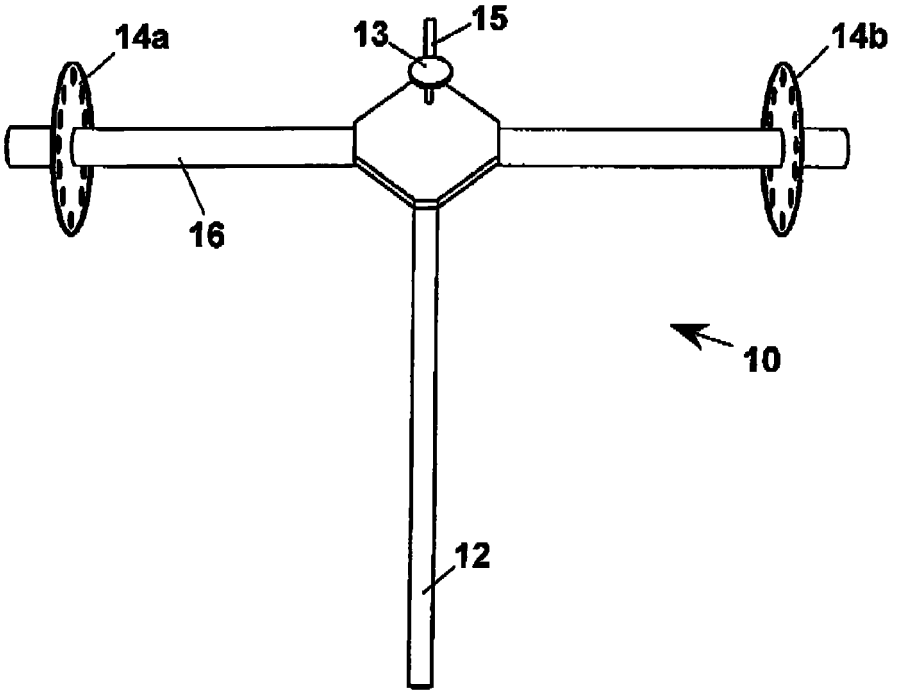
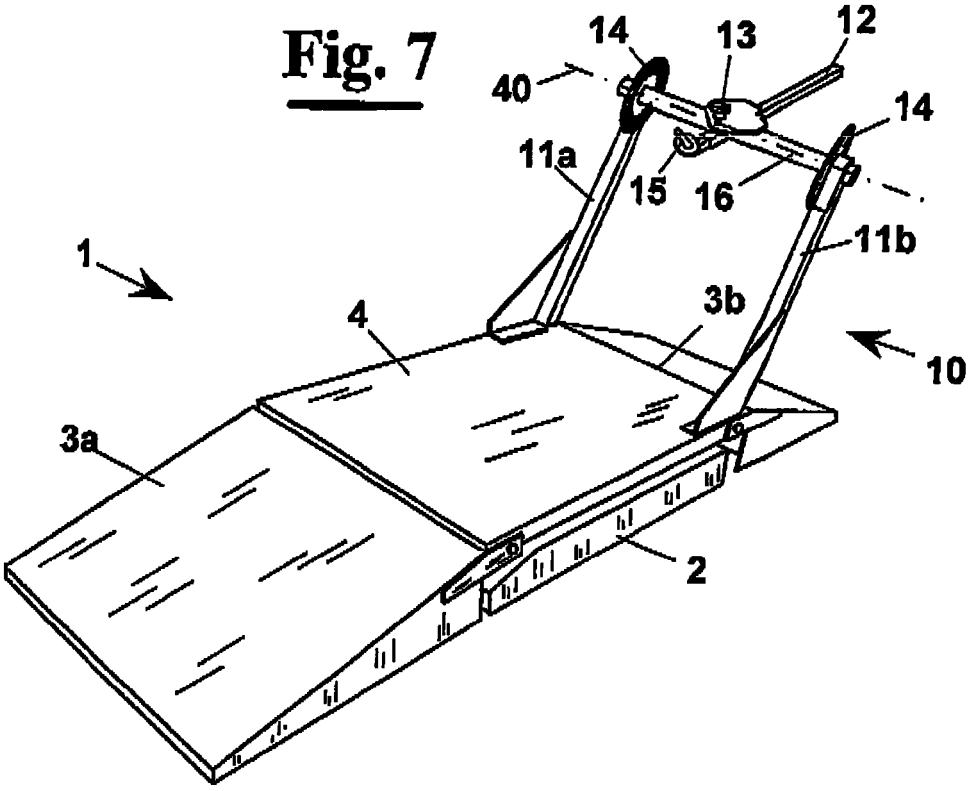


Fig. 7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3b
4
10
3a
2

Fig. 8

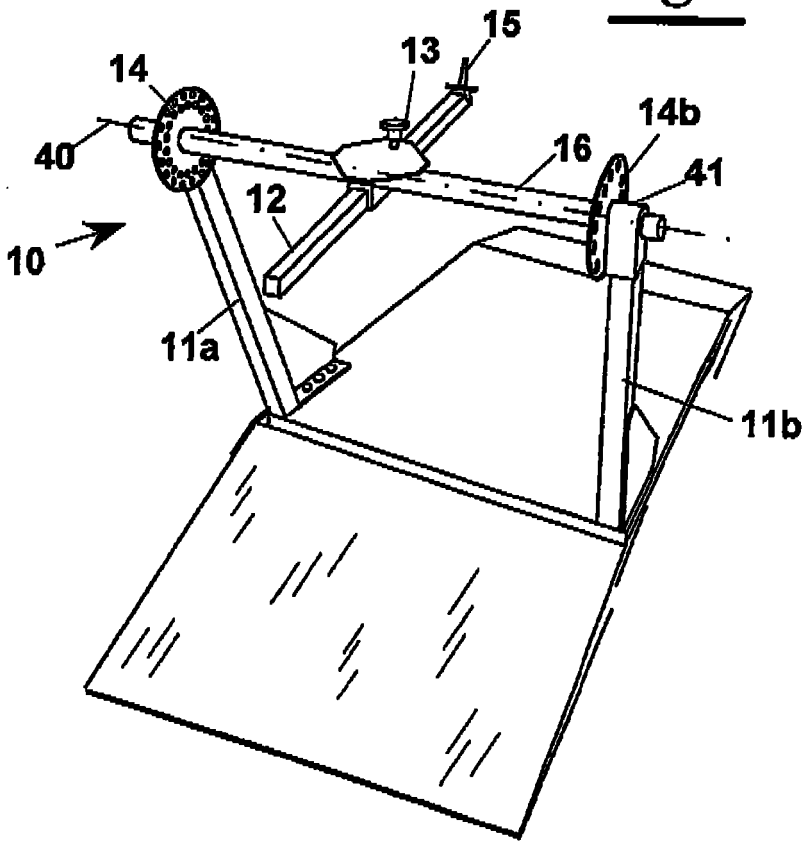
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Fig. 9

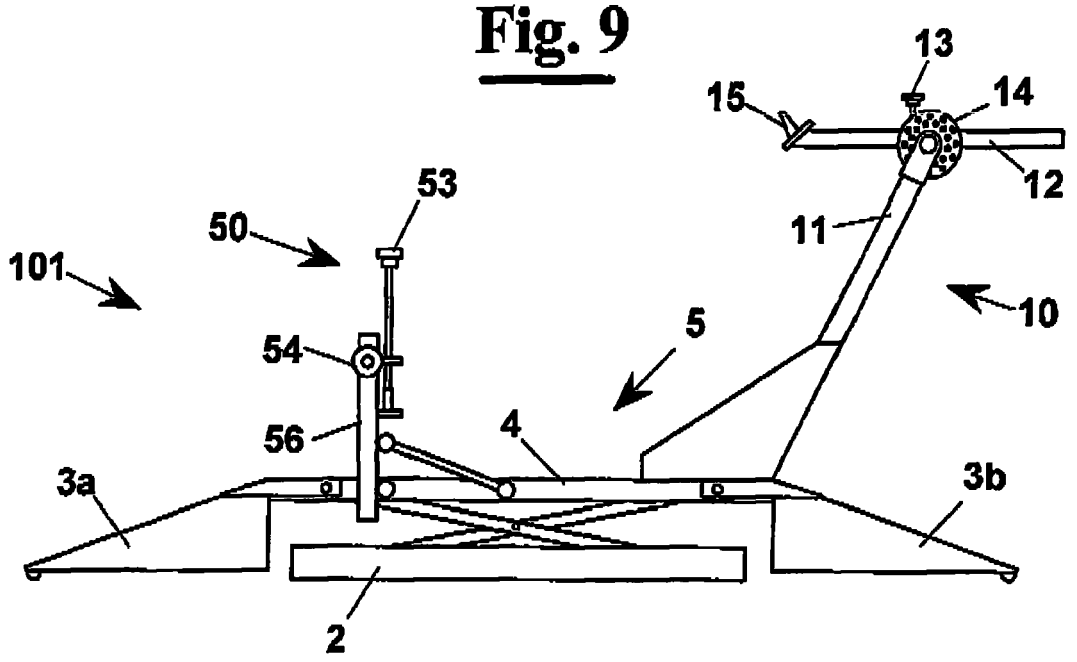
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Fig. 10

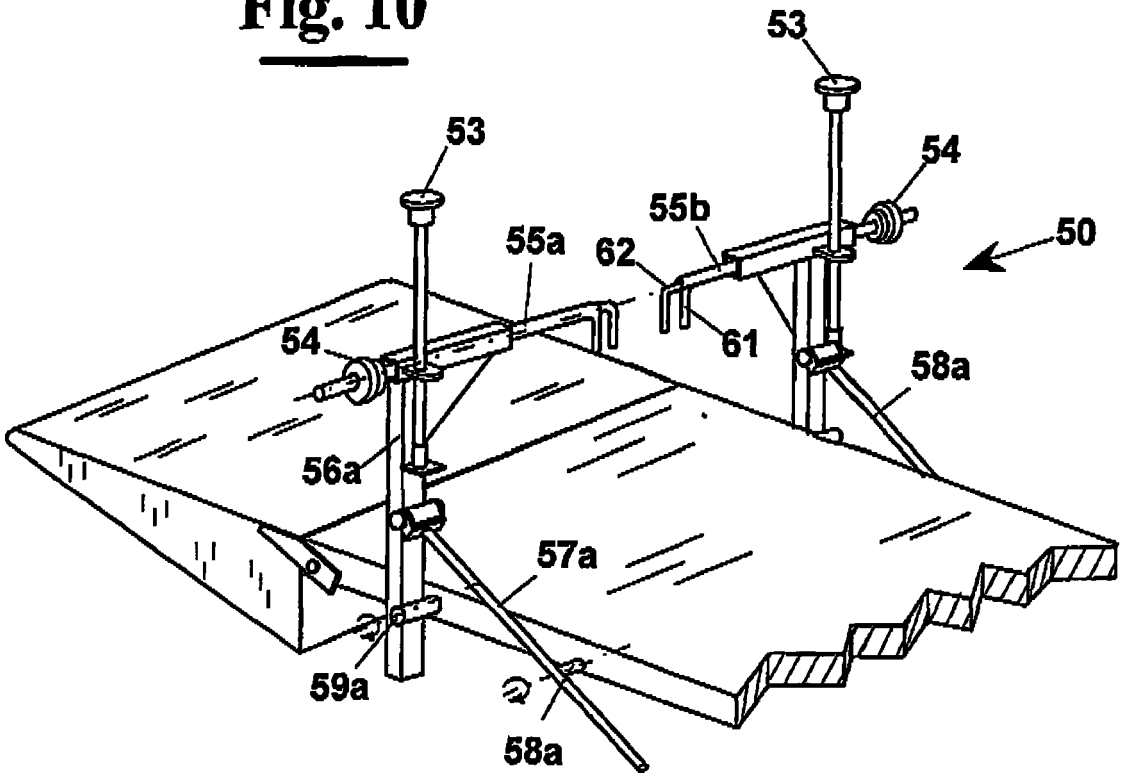
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Fig. 11

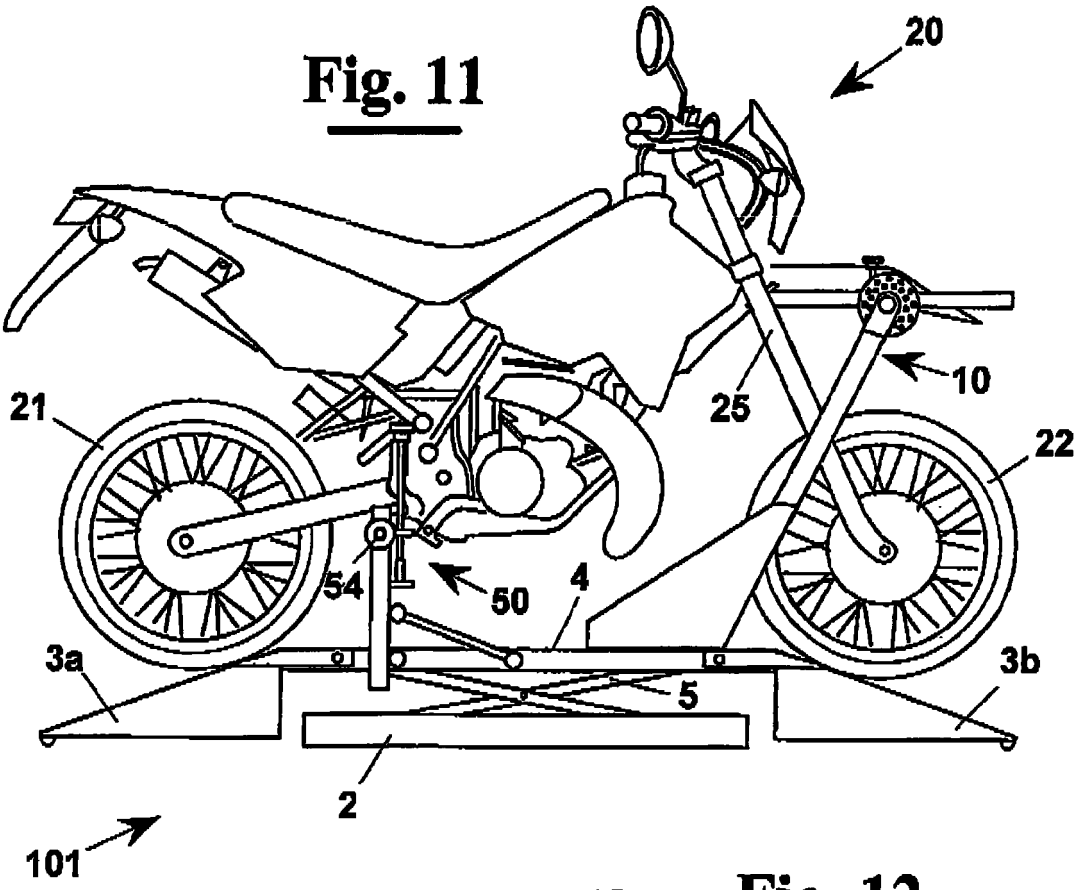

Fig. 12

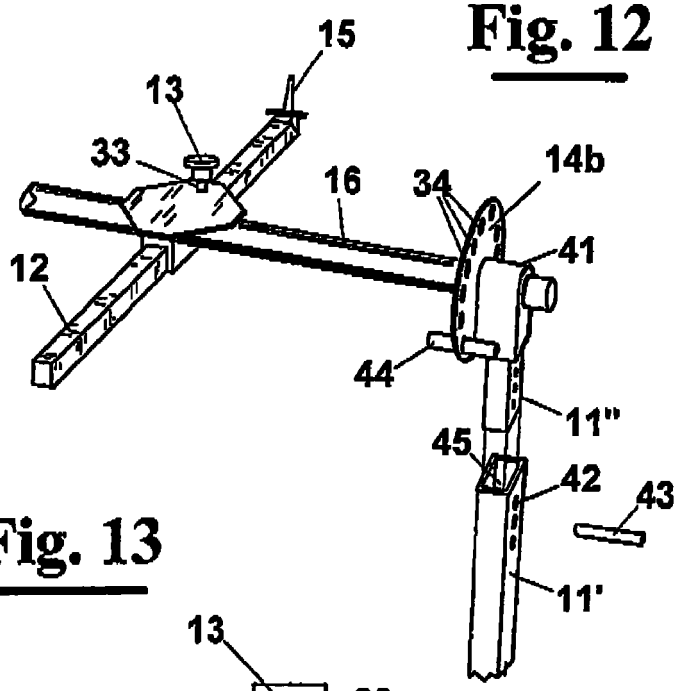

Fig. 13