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(54) Lift truck with telescopic arm.

(57) A lift truck with a telescopic arm, of the type consisting of a central frame mounted on wheels and carrying both an operator's cab and a telescopic arm which swings in a vertical plane and is secured to the frame in a rear upper region, said frame having a rear region comprising two upwardly projecting parallel plates (8) forming a space divided by a central wall (14), which is secured to the plates by welded transverse tubes (15a, 15b, 16a, 16b) and forms two independent compartments, one of which contains in its rear upper region two bushes holding the horizontal pivoting shaft (3) of the crane swing arm and supported respectively by one of the frame plates (81) and by said central wall (14), and a transverse beam (17) from which there extend two lugs (18) carrying at their projecting end the two bushes (19) containing the pivot pin for the cylinder-piston unit (20) which raises and lowers the telescopic arm, the second compartment (22) containing support means (24) carrying the internal combustion engine (23) driving the unit, together with the respective hydraulic pump (26).

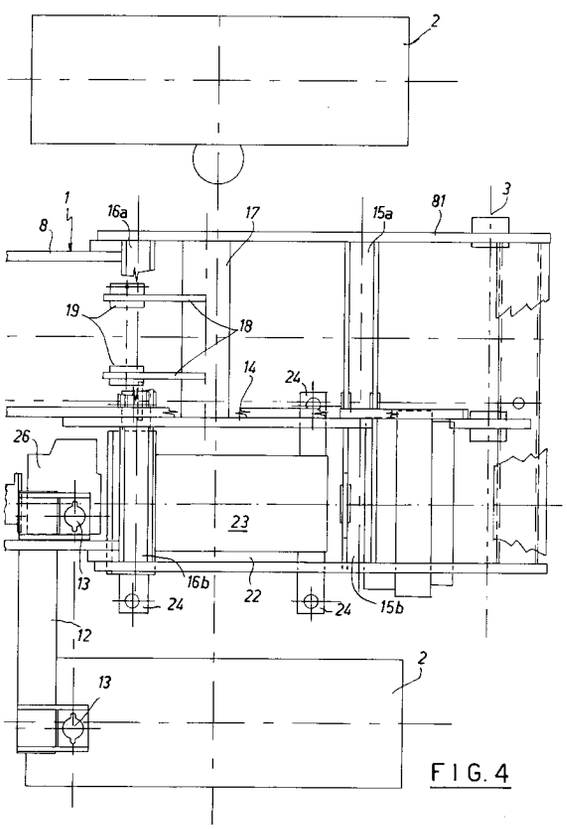

FIG. 4

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On working sites, and in particular building sites, there is widespread use of self-propelled lift trucks provided with a telescopic arm, to the end of which a bucket, a material lifting fork or other devices can be fitted.

These lift trucks, which actually resemble small crane trucks, generally suffer from a series of design problems deriving from the need to provide the operator with perfect visibility when the lifting arm is lowered into its rest position, while at the same time ensuring that the frame to which said arm is hinged is sufficiently rigid. The known designs comprise a robust welded metal plate frame which is stiffened transversely by several section bars or tubes, to form a perfect base for the articulation of the lifting arm.

The drive cab is generally located to the side of this frame, in a position between the device wheels, so that in practice it juts out.

The most serious problem arises from the need to find a position for the engine which does not interfere with the swinging of the lifting arm in the vertical plane, in order to allow the arm to be lowered to a level such as not to interrupt the operator's field of vision when the arm is in its lowered position.

A solution to this problem has been found by locating the jutting engine in a position substantially symmetrical to that of the drive cab about the frame, and leaving the central part of the frame available for the lifting arm.

However this solution has not proved entirely satisfactory, particularly with regard to the method of supporting and fixing the completely jutting engine, and because the engine accessories such as hydraulic pumps and the like are difficult to position within the small space made available by the wheels.

A further drawback derives from the fact that the jutting location of the engine, which is always heavy, detracts from the overall stability of the system and makes torsional stiffening of the frame necessary, this not always being easy to achieve.

The present invention provides a self-propelled lift truck of the aforedescribed type which obviates the aforesaid drawbacks by virtue of a particular frame configuration which enables the engine to be located within or substantially within the frame in a position to the rear of that occupied by the drive cab.

The merits and functional and constructional characteristics of the invention will be more apparent from the detailed description given hereinafter with reference to the figures of the accompanying drawings, in which:

Figure 1 is a side view of the lift truck;

Figure 2 shows it without the drive cab;

Figure 3 is a plan view showing the frame without the lifting arm;

Figure 4 is an enlarged view of the rear part of Figure 3;

Figure 5 is a rear view of Figure 4;

Figure 6 is an enlarged view of the rear part of Figure 1.

Figure 1 shows a frame 1 mounted on wheels 2 and supporting in a rear position a transverse shaft 3 on which a telescopic arm 4 is pivoted. The telescopic arm 4 is driven in a vertical plane by the cylinder-piston unit 20 which at one end is hinged to the frame 1 and at its other end is hinged to the telescopic arm 4 at the bracket 21.

On the frame 1 there is also mounted a drive cab 5 provided with front lamps 6 and an upper accident prevention guard 7.

Figure 2 shows that the frame 1 is composed of two robust longitudinal plate metal members 8, which extend at their rear in the form of two plates 81 acting as supports for the transverse shaft 3.

The longitudinal members 8 and the plates 81 are made consistent by a series of transverse beams, of which Figure 3 shows the front beam 9 and, for the purposes of understanding the invention, an intermediate beam 99.

From the front beam 9 there extend two outwardly inclined brackets 10 to which there are hinged two arms 11 carrying a resting foot 110 at their end.

Only one of the brackets 10 is shown for clarity.

Two jutting beams 12 are welded to an intermediate position on and perpendicular to the frame 1, and upperly carry the means 13 for fixing the cab 5.

The rear part of the frame 1 comprises a cental wall 14 which is provided with large apertures, not shown in the figure, for receiving the lateral parts of the engine, and is maintained in position by strong welded tubes 15a, 15b, 16a and 16b, which join said central plate to the two side plates 81.

One of the two compartments into which the rear part of the frame 1 is divided by the central wall 14 comprises a thick tube 17 welded between said central wall 14 and one of the plates 81, and to which there are welded two robust brackets 18 provided at their end with bushes 19.

The bushes 19 form the seat for the transverse hinge pin for the said cylinder-piston unit 20 which vertically drives the telescopic arm 4.

Between the central wall 14 and that plate 81 adjacent to the drive cab 5 a compartment 22 is formed containing the engine 23 and the relative hydraulic pump 26, these operating all the machine members.

The engine 23 is fixed to the frame 1 by four support brackets 24, which are fixed to the resting

surface of the engine 23 via rubber blocks 25.

The hydraulic pump 26 is juttingly fixed to the front of the engine casing, and is supported by it.

From Figures 4, 5 and 6 it can be seen that the engine 23 is substantially contained within the space to the rear of the cab, leaving the space to the right of the cab completely free to receive the telescopic arm 4 during its swinging movement.

From Figure 1 it can be seen tat when in its lowered position, said telescopic arm 4 allows completely free vision to the operator seated in the cab.

Those parts of the machine forming the frame and the members operated by the hydraulic pump are neither illustrated nor described, these being totally usual components well known to the expert of the art.

Claims

1. A lift truck with a telescopic arm, of the type consisting of a central frame mounted on wheels and carrying both an operator's cab and a telescopic arm which swings in a vertical plane and is secured to the frame in a rear upper region, characterised in that the machine frame has a rear region comprising two upwardly projecting parallel plates (8) forming a space divided by a central wall (14), which is secured to the plates by welded transverse tubes (15a, 15b, 16a, 16b) and forms two independent compartments, one of which contains in its rear upper region two bushes holding the horizontal pivoting shaft (3) of the crane swing arm and supported respectively by one of the frame plates (81) and by said central wall (14), and a transverse beam (17) from which there extend two lugs (18) carrying at their projecting end the two bushes (19) containing the pivot pin for the cylinder-piston unit (20) which raises and lowers the telescopic arm, the second compartment (22) containing support means (24) carrying the internal combustion engine (23) driving the unit, together with the respective hydraulic pump (26).

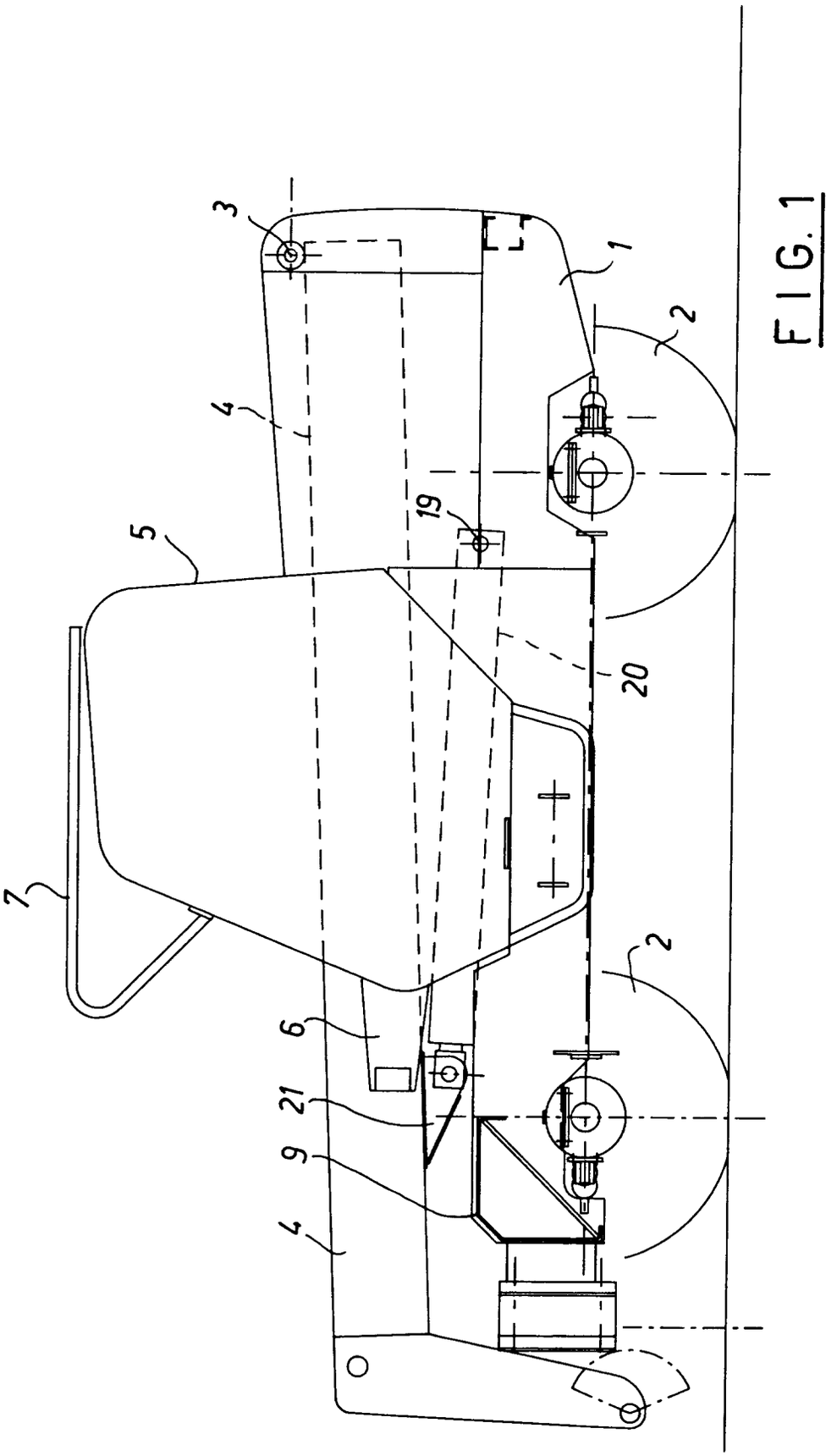


FIG. 1

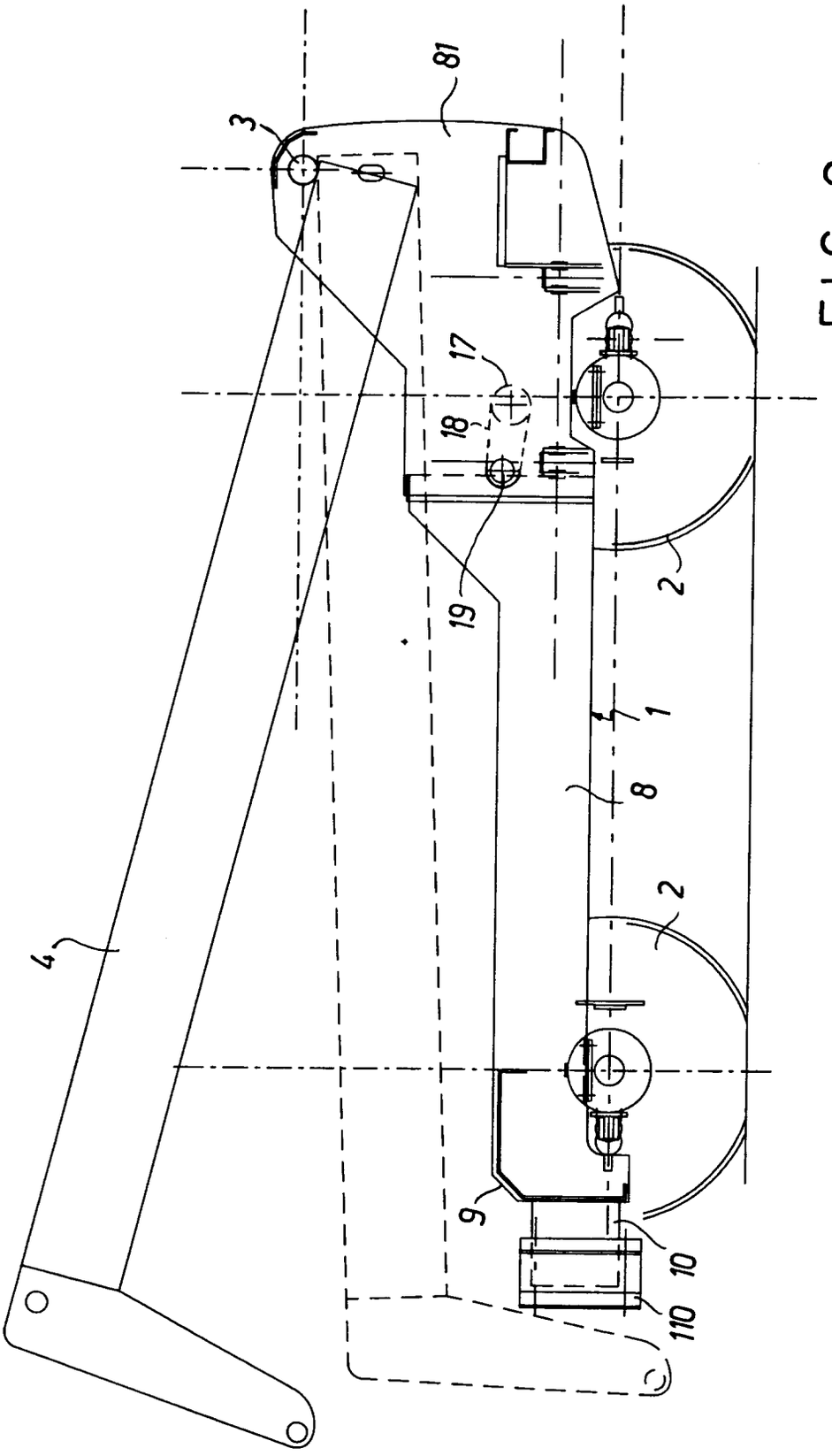


FIG. 2

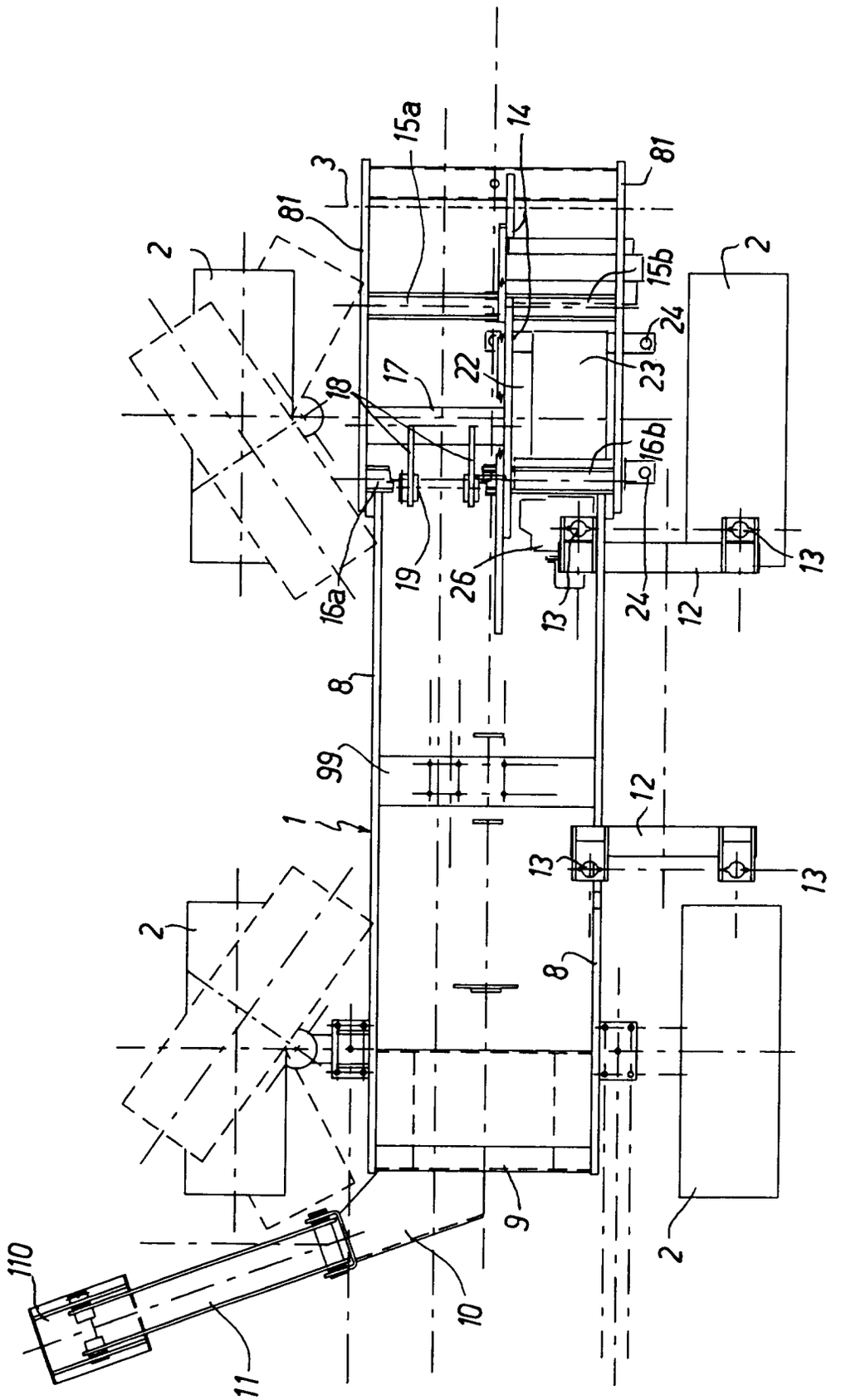

15a
14
81
3
81
2
15b
2
24
23
22
17
18
16b
19
26
16a
13
24
12
13
8
99
1
12
13
13
2
8
9
2
110
10
11

FIG. 3

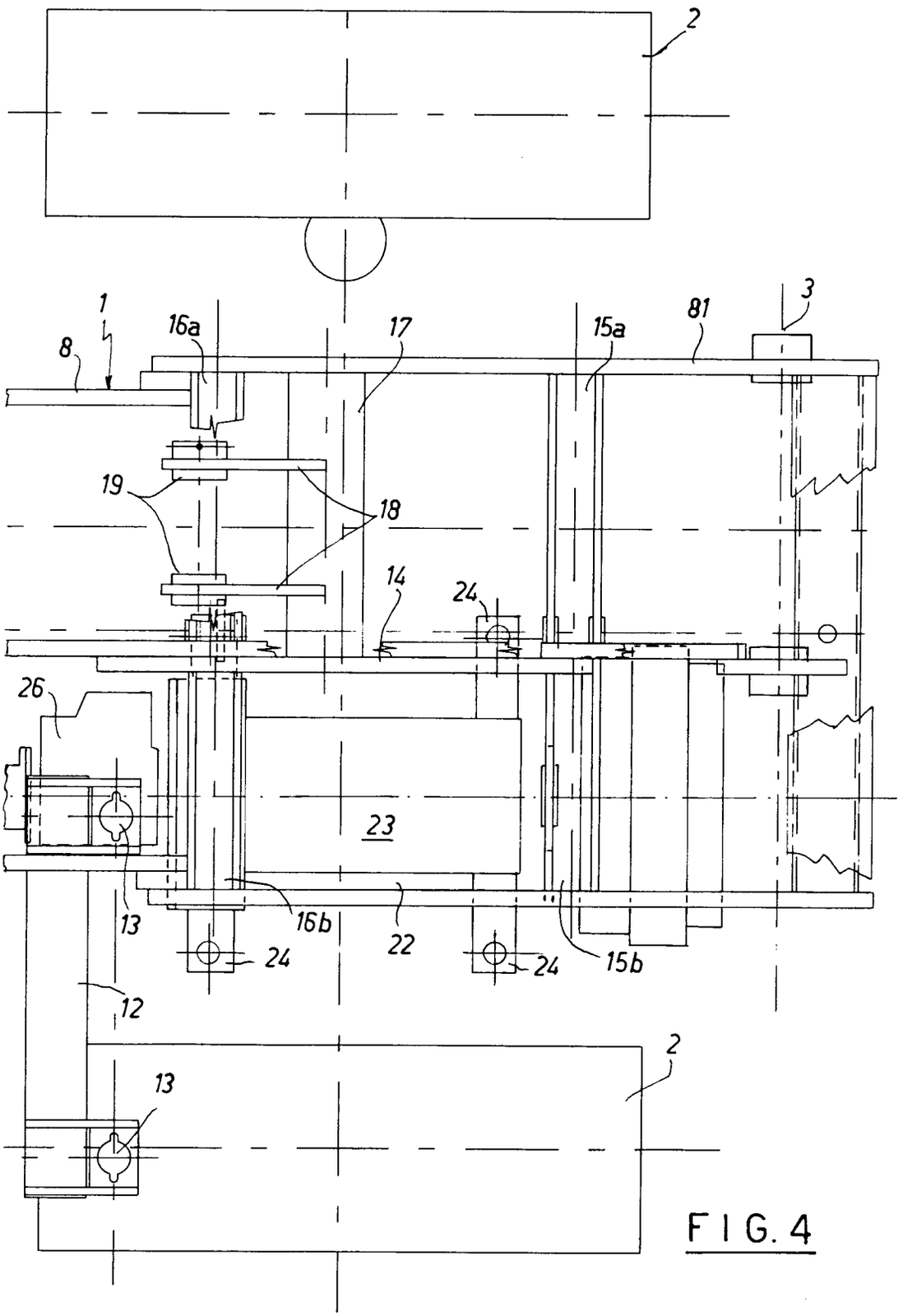
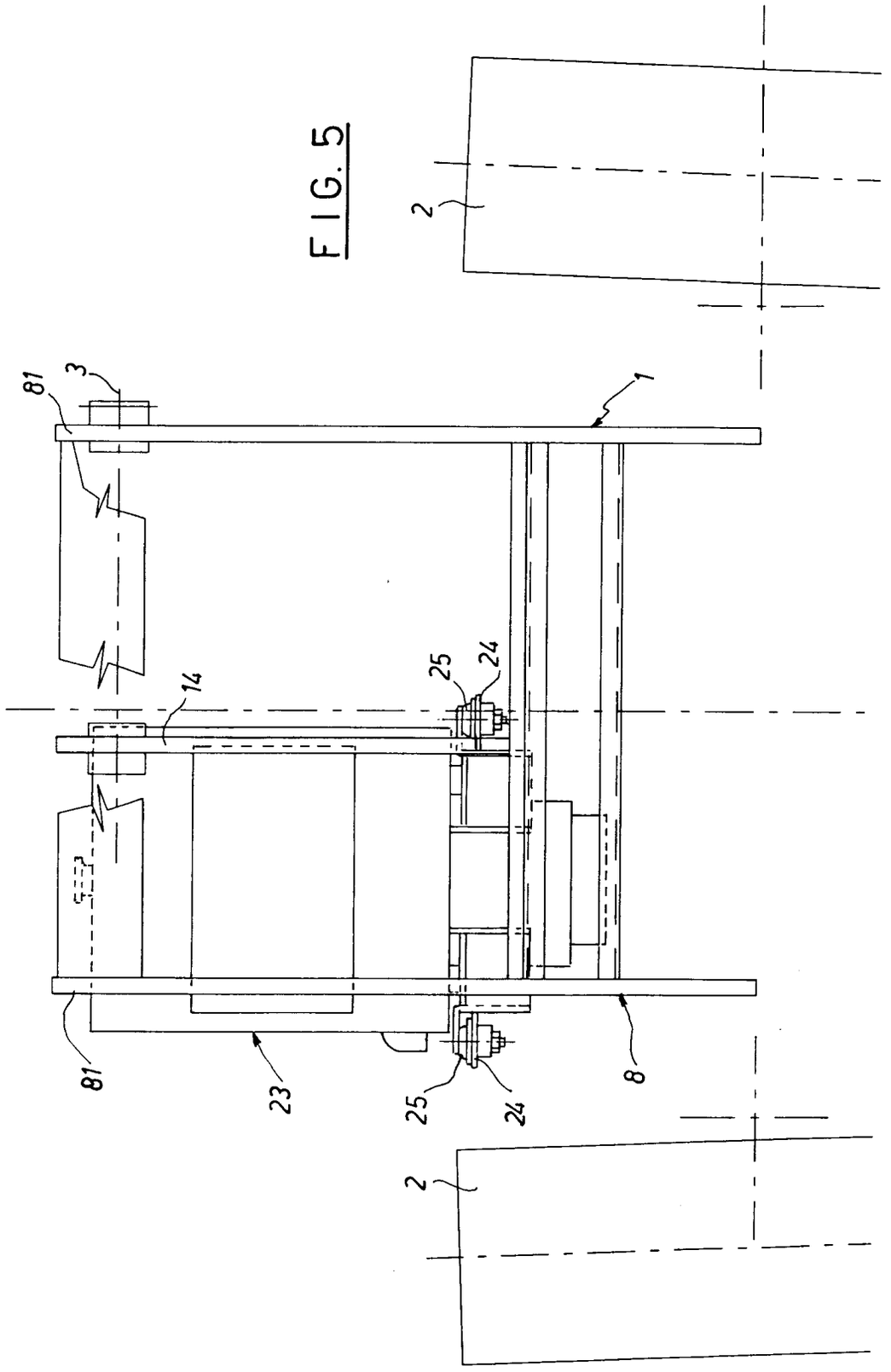


FIG. 4

FIG. 5



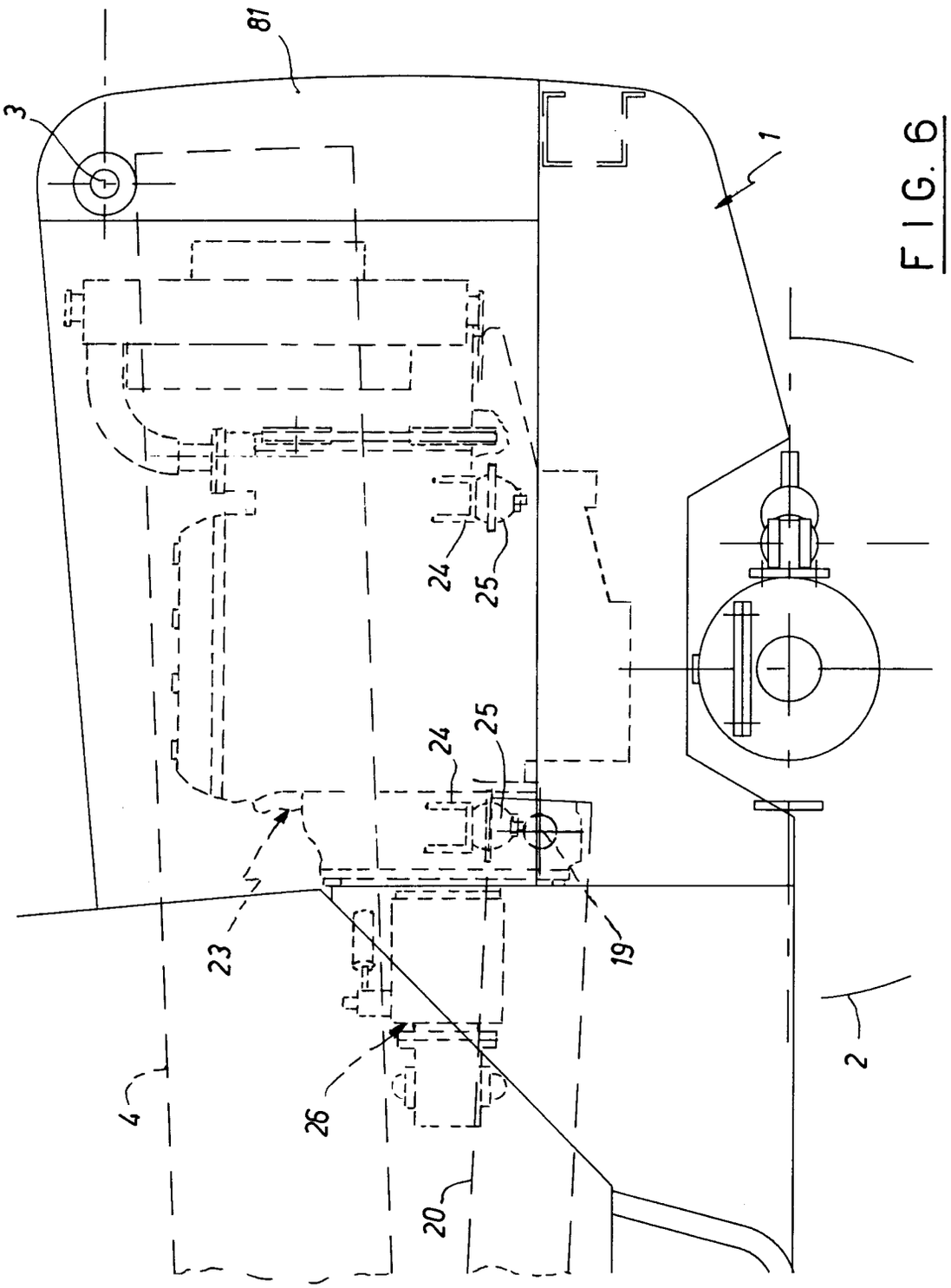


FIG. 6

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EUROPEAN SEARCH REPORT

Application Number

EP 93 20 1793

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	WO-A-8 900 972 (MERLO S.P.A. INDUSTRIA METALMECCANICA) ---		B66F9/065
A	US-A-4 964 778 (MUTO ET AL.) ---		
A	US-A-4 755 102 (MERLO) ---		
A	US-A-3 688 929 (MC INTYRE) -----		
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B66F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	26 OCTOBER 1993	GUTHMULLER J.A.

CATEGORY OF CITED DOCUMENTS

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