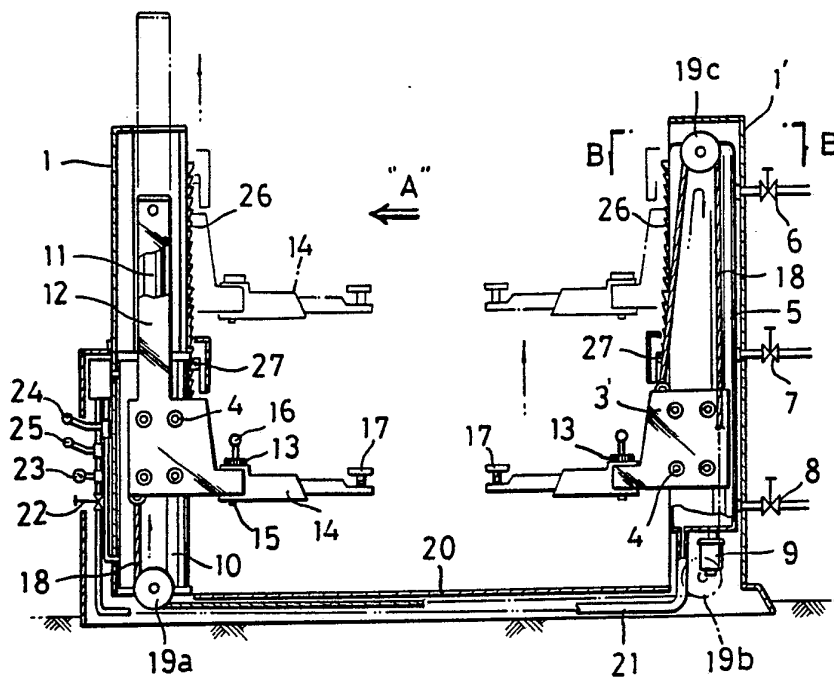


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(54) Title: LIFT



(57) Abstract

A lift usually used in a garage for better inspection or repair thereof. The lift has two fixed uprights (1, 1') securely fixed to the ground each of which uprights has carrier member (3, 3') by which automotive vehicles are carried. One upright has an air tank (5) thereinside. Even in case of a power failure the lift can be operated by means of the air stored in the air tank (5) or by other means.

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LIFT

Field of the Invention

This invention relates to a lift, and more particularly to a lift for lifting automotive vehicles of the type used in a garage for the inspection or
5 repairing thereof.

Background of the Invention

For better inspection and repair of an automotive vehicle in a garage, there has usually been used two types of lifts, ie. mechanically-operated
10 lift and hydraulically-operated lift.

In mechanically-operated lift, the energy from a motor is reduced by a reduction gear and then, through transmission such as chains or belts, arms of the lift is lifted or lowered with the automotive vehicles carried thereon. This mechanism needs considerable power for smooth operation by which the work
15 may be done in safety. Thus, a motor of big power is utilized resulting in considerable waste of electrical energy.

Another disadvantage of this lift is that this mechanism should comprise intricate electrical wiring, an electric device for movement of motor to the right and to the left in turn and various auxiliary parts resulting in difficult manufacture.

Further, this lift cannot be operated at all in case of power failure. Operating the lift in a moist place, snowy or rainy weather involves risk of electric shock.

The other one, a hydraulic lift having hydraulic

- 2 -

operated arms, like the mechanically operated lift, is also constructed complicately comprising motor, pump, valves incurred by intricate plumbing, intricate electrical wiring, control switch and the like.

5 This hydraulic mechanism according to its complicate construction is very high in its production cost and maintenance fee. And considerable consumption of electricity is a burden on the users.

10 Further, with this hydraulic lift, such devices as spray gun, impact wrench can not be used. In addition, it is cumbersome and uneconomical in that the oil required to operate the oil cylinder must be exchanged regularly. In winter time, the pump and valve tend not to be operated owing to the cooling of
15 the oil.

In a garage and the like, a plurality of lifts are installed for work inefficiency, which requires as many power devices and sources as the lifts resulting in considerable power waste.

20 Summary of the Invention

 An object of the present invention which overcomes the disadvantages pointed out above in the prior art lifts is to provide a lift having an air cylinder therein of which up-and-down movement
25 effects lifting and lowering operation of its arms in balance and safety.

 In the present invention, the compressed air for operating an air cylinder is stored in a separate storage tank. The air storage tank may be fulfilled
30 either by air produced from the air compress or by exhaust gas discharged from other automotive ve-

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hicles so that in an emergency such as in power failure the operation of the lift will be achieved normally.

5 A compressed air tank constituting part of the present invention has another exhaust pipe through which air may be supplied to an impact wrench, spray gun or other various parts of automotive vehicles at need.

10 Other advantage is that a plurality of lifts each of which is constructed according to this invention, may be operated by only one compressor.

Description of the Drawings

15 Fig. 1 is a partial front elevational view showing details of the present invention with the carrier arms in an slightly elevated position;

Fig. 2 is a partial side elevational view taken along the arrow "A" of Fig. 1; and

Fig. 3 is a sectional view taken along lines B-B' of Fig. 1.

20 Description of the Preferred Embodiments

Referring to the drawings, the bottom ends of uprights 1, 1' are buried securely under the ground. The uprights 1, 1' houses guide rails 2 respectively which guide rollers 4. The rollers 4 are movably
25 mounted on both sides of carriers 3, 3'.

Centrally inwardly of the upright 1' is provided a longitudinal air tank 5. Three valves 6, 7, and 8 regulate and check the air of an air tank 5.

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The uppermost valve 6 is for checking and regulating the air produced from an air compressor (not shown). The middle valve 7 other than serving to lift the carriers 3,3' also serves to regulate and check the air of the air tank 5 for the air to be supplied to an impact wrench or spray gun, if necessary.

The lower control valve 8 is for use when the use of the air compressor is impossible such as in the case of power failure. In such an emergency, the exhaust gas from other automotive vehicles through a hose and the like may be supplied to the air storage tank 5, whereby the lifting operation will be achieved without trouble.

An auto trap 9 is provided below the air tank 5 for removing the moisture produced from the air tank thus facilitating the operation of an air cylinder 10.

The air cylinder 10 is longitudinally provided centrally inwardly of the upright 1. A piston support 12 connected upwardly of the carrier 3 is joined to the upper end of the piston 11 so that the piston 11, the piston support 12 and carrier 3 move simultaneously with one another.

Carriers 3,3' are mounted on the uprights 1,1' respectively (see Fig. 3) and arms 14 together with gears are movably fixed to the uprights 1,1' by pins 15. A control lever 16 serves to limit the rotation of the arms 14 causing the arms 14 to be stopped at desired point.

Balancer members 17 are movably bolted into the end of the arms 14 and their height may be changed freely by means of a screw. The balancer members 17 serve

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to balance automotive vehicles when lifted.

As shown in Fig. 1 the carrier 3 which is raised or lowered by a piston 11 has anchored protions at its bottom to which a wire rope 18 is securely anchored. A wire rope 18 is longitudinally guided by a roller 19a and moves through the inside of the base cover 20. By the guide of rollers 19b,19c which ride into the lower and upper ends of the air tank 5 the other end of the wire rope 18 is anchored to the upper end of the right carrier 3'.

A pipe 21 which transmits the air pressure from the air tank 5 passes through the inside of the base cover 20, a gate valve 22, and a pressure gage 23.

The operating levers 24,25 for controlling the air from the upper and lower part of the air cylinder 10 move the piston 11 upward and downward.

On both sides of the uprights 1,1' are secured tooth member. On the tooth of the tooth member of the uprights 1,1' the ratchet 27 is caught at suitable point which is determined by turning of the lever 28. This prevents the carriers 3,3' from falling or slipping from its determined position even in case the air cylinder 1 is wrongly operaged owing to caresessness.

The detail operation of the lift is decribed as follows.

Air of a predetermined pressure is supplied into the air tank 5 by means of an air compressor and the like. If desiring to lower the carriers 3,3' the air in the cylinder 10 will be exhausted by operating the

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lever 25 causing the carriers 3,3' with their arms 14 to be lowered, thus allowing the piston 11 to be fitted within the cylinder 10. Thereby the piston support 18 pushes down the carrier 3 and the wire rope 18 moves to the right whereby the other end of the wire rope 18 which is anchored to the upper end of the carrier 3' by being guided by the rollers 19b, 19c is lowered thus lowering the right carrier 3'.

An automobile vehicle is put on the arms 14 between the uplifts 1,1' and between the supports 17. At this time, to maintain balancing of the cars which will be inspected or repaired the arms 14 will be rotated in a suitable limit degree and then will be held in position securely by meshing of the lever 16 with the gear 13.

When desiring lifting of automotive vehicles, the operation of the lever 24 will cause the air in the air tank 5 to be transmitted through the pipe 21 into the air cylinder 10. This allows the piston 11 to be raised causing the piston support which is secured to the both sides of the piston 11 and connected to the carrier 3, to be raised simultaneously therewith. Thereby, the carrier 3 and the arm 14 will be raised.

Simultaneous with the upward movement of the carrier 3, the wire rope 18 will be moved upwardly thus by the rollers 19a, 19b, 19c lifting the right carrier 3'.

The maintenance of the opened position of the lever 24 enables the continuous upward movement of the automobiles. And when the automobile gets to a

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5 suitable elevated position, by operating the lever 24 to be in the closed position, the lifting is stopped maintaining the height. In this condition by rotating the lever 28 for the engagement of the ratchet 27 and the toothed portion of the uprithts 1,1' , the carriers 3,3' will be more securely mounted to the up- rights 1,1' assuring safe work condition.

10 When the inspection or repairing is done and the automotive vehicles desired to be lowered to ground or to a desired position, the teeth of the ratchet 27 and the uprights 1, 1' are manually disengaged and the lever 25 is opened whereby the air in the air cylinder 10 is exhausted outward thus lowering the piston 11 gradually.

15 Even when desiring to operate a plurality of lifts constructed according to the present invention, only one air compressor may be utilized. Because the air is needed only when lifting automotive vehicles. That is, the lowering operation of the automotive ve-
20 hicles is achieved by exhausting the air only, without requiring air so that little electrical energy and small maintenance fee are required. Further, in case of power failure, the operation of lift can by achieved a number of times.

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What is claimed is:

1. A lift for raising or lowering automotive vehicles for facilitating the inspection and repair comprising:

5 a pair of lifts 1,1' secured longitudinally to the ground,

carriers 3,3' moving upwardly and downwardly along said lifts 1,1',

10 arms 14 moving upwardly and downwardly simultaneously with said carriers 3,3',

support member 17 moving upwardly and downwardly simultaneously with said carriers 3,3' and said arms 14,

15 a wire rope 18 for moving said carriers 3,3', said arms 14 and said support member 17,

rollers 19a, 19b, 19c for guiding said wire rope 18,

control valves 6,7,8,

20 an air tank 5 to which said control valves 6,7,8, are connected being longitudinally secured in the one side lift 1',

a pipe 21 connecting said air tank 5,

Operating levers 24, 25 for controlling the transmission of the air from said pipe 21,

- 9 -

an air cylinder 10,

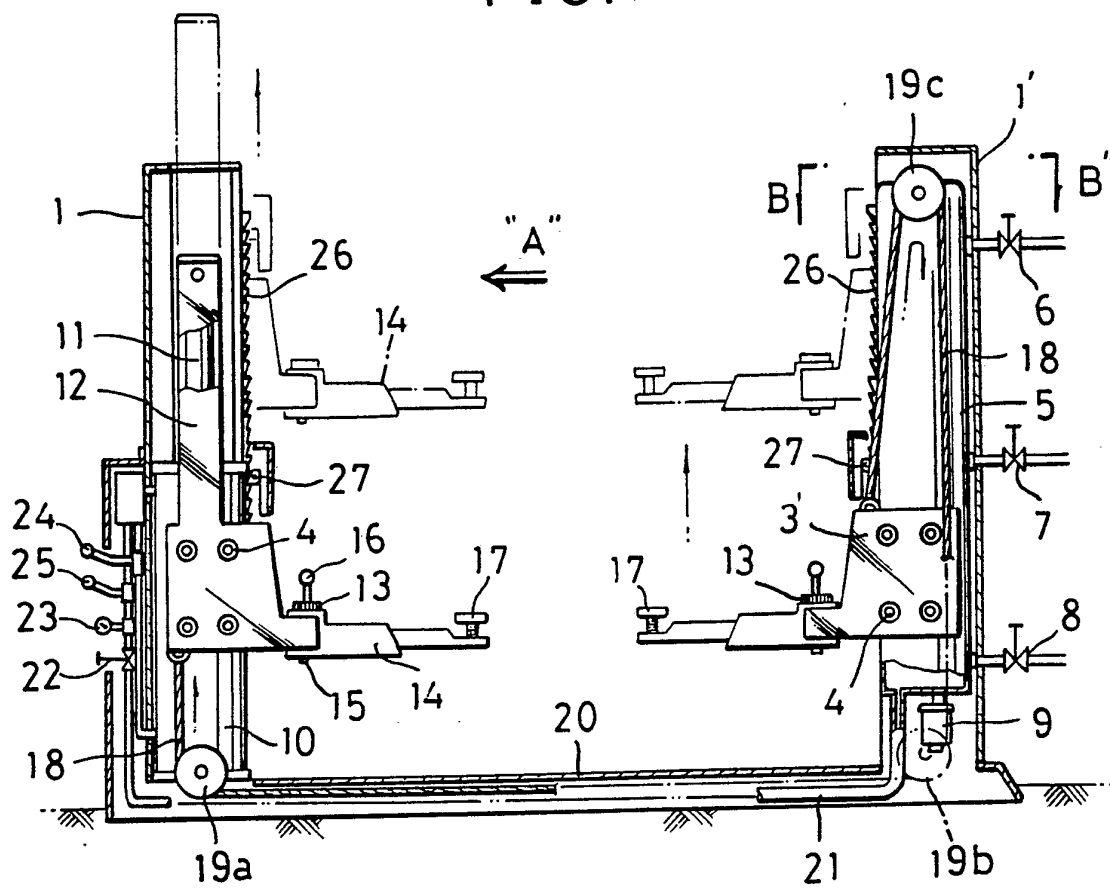
a piston 11,

a piston support,

5 said air cylinder 10 and said piston operated
by said operating levers 24,25 thus causing said
piston support 12 and said carrier 3 to be moved simultaneously with said the other carrier 3'.

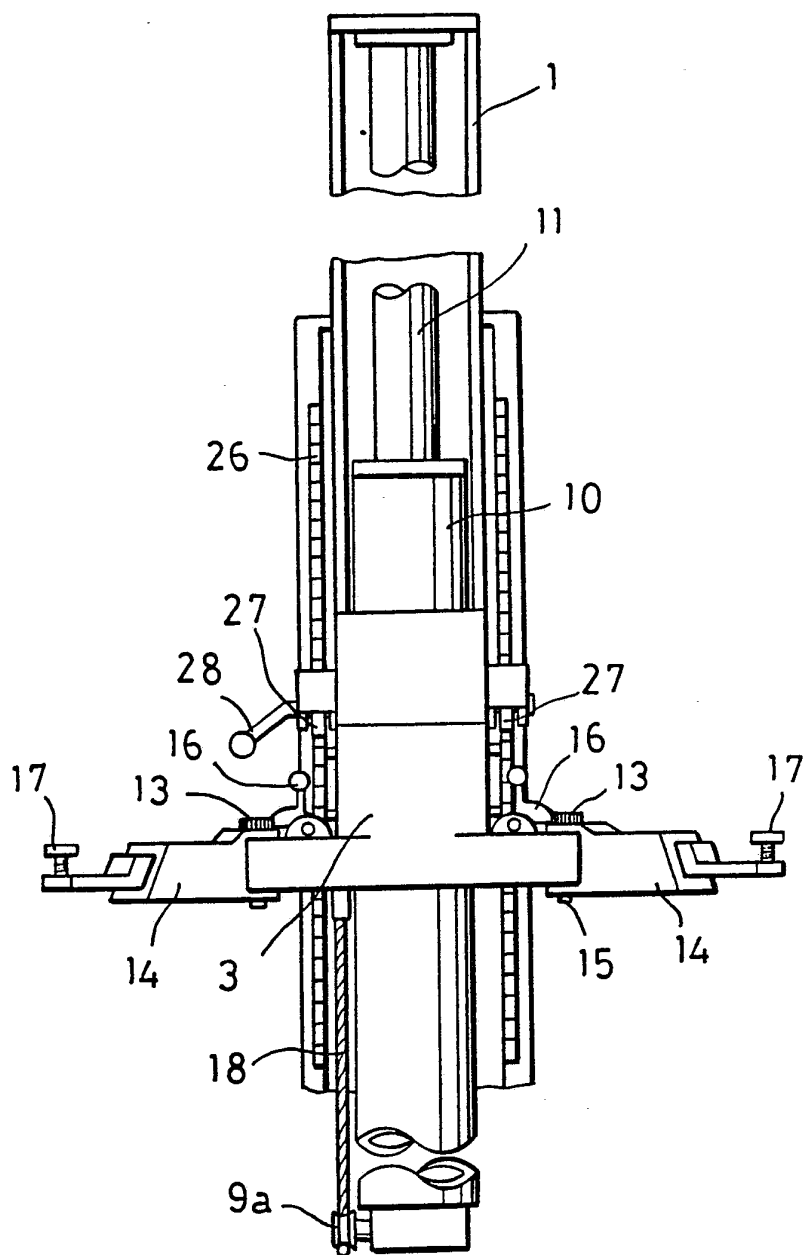
1 / 3

FIG. 1



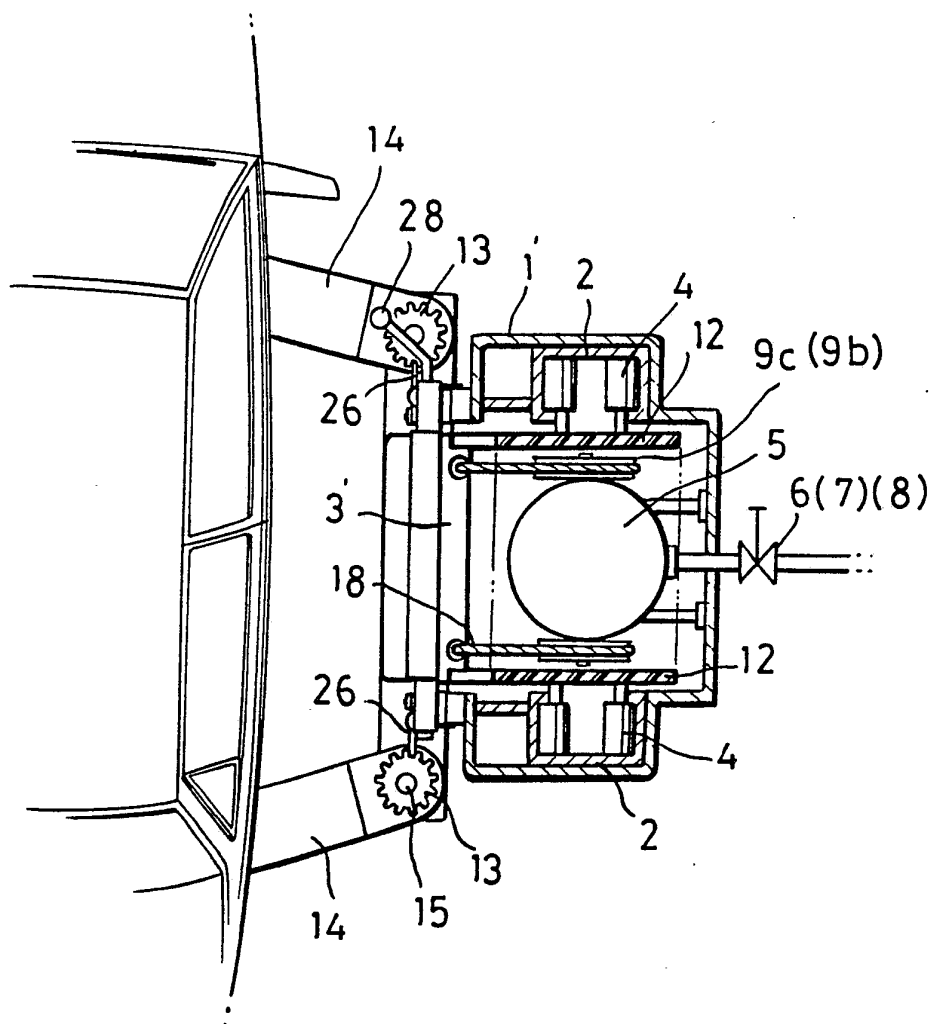
2 / 3

FIG. 2



3/3

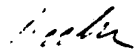
FIG. 3



INTERNATIONAL SEARCH REPORT

International Application No PCT/KR 88/00007

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) *		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC ⁴ : B 66 F 7/04		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
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Int.Cl. ⁴ :	B 66 F 7/00, 7/02, 7/04, 7/08, 7/16, 7/20	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT *		
Category *	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
A	US, A, 2 139 597 (T.A.MARTIN) 06 December 1938 (06.12.38), see fig. 1,5.	(1)
A	AU, A, 470 742 (FRANK MOLNAR) 14 February 1974 (14.02.74), see fig. 1,2,4.	(1)
A	GB, A, 1 187 163 (LAYCOCK ENGINEERING LTD.) 08 April 1970 (08.04.70), see fig. 1,3.	(1)

* Special categories of cited documents: ¹⁰ "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "A" document member of the same patent family		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
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Anhang zum internationalen Recherchenbericht über die internationale Patentanmeldung Nr.

In diesem Anhang sind die Mitglieder der Patentfamilien der im obengenannten internationalen Recherchenbericht angeführten Patentdokumente angegeben. Diese Angaben dienen nur zur Unterrichtung und erfolgen ohne Gewähr.

Annex to the International Search Report on International Patent Application No. PCT/KR 88/00007

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Annexe au rapport de recherche internationale relatif à la demande de brevet international n°.

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Im Recherchenbericht angeführtes Patent- dokument Patent document cited in search report Document de brevet cité dans le rapport de recherche	Datum der Veröffentlichung Publication date Date de publication	Mitglied(er) der Patentfamilie Patent family member(s) Membre(s) de la famille de brevets	Datum der Veröffentlichung Publication date Date de publication
US - A - 2 139 597	06/12/88	NONE	
AU - A - 470 742	14/02/74	AU-A1- 45 488/72	14/02/1974
GB - A - 1 187 163	08/04/70	BE-A - 730 266 DE-U -6 910 865 FR-A5-2 004 515 NL-A -6 904 414 NL-B - 162 346 NL-C - 162 346	01/09/1969 07/08/1969 28/11/1969 24/09/1969 17/12/1969 16/05/1980