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(12) # EUROPEAN PATENT APPLICATION

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(54) **Improvements in telescopic columns for making foundations.**

(57) The columns (15) are sustained and guided by tractors or other suitable means and terminally carrying the excavation tools (21), such improvements including in combination and coordination a support and positioning auxiliary platform (16) which is at least partially mobile, a support plate (27) which is at least partially rotating and sustained by said auxiliary platform (16) and supporting the said telescopic column; there being included means (18) for generating the frontal oscillation of the auxiliary platform (16) and means (32) for generating the partial rotation of the said support plate (27).

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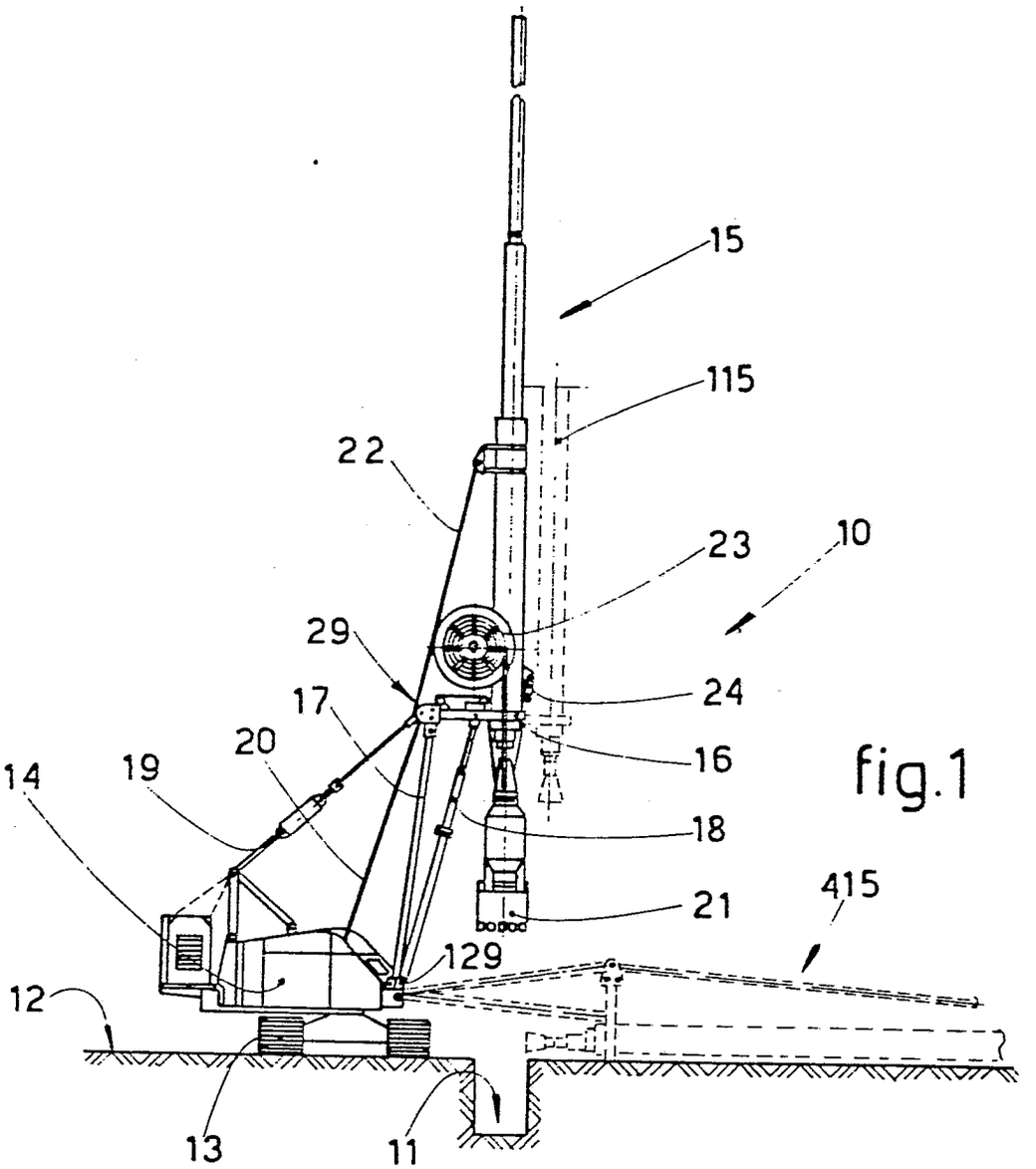

fig.1

TITLE MODIFIED
see front page

1. Description of the invention entitled:
"Improvements in Telescopic Columns for making foundations and Columns for foundations thus improved".
In the name of Casagrande & C. S.p.A. of Fontanafredda (PN)
Filed on under no.

* * *

The present invention relates to improvements in telescopic columns for excavating trenches and foundations, as well telescopic columns for making trenches and foundations adopting such improvements.

The improvements relate to telescopic columns which serve to sustain, guide and drive buckets, augers, drills and other tools normally used in excavating trenches, foundations and similar.

In the field of digging linear trenches, foundations and perforations by columns, telescopic columns are used which consent digging at a great depth by placing the support means on an easily accessable surface area.

It is also known that the telescopic columns are equipped with buchets, drills or similar means for the purpose of executing the required excavation.

It is also known, and the name itself hints at that, that the telescopic columns are advantageously formed of a plurality of columns insertable within each other and made to extend for use according to the depth of the job.

There are also various types of known equipments which are terminally provided on the columns and also known are the driving and movementation system of these equipments.

The present system is directed to the system of installing, anchorage and displacement of the columns.

The present invention improves the manoeuvrability of the telescopic columns expanding thus their field of utility.

It is a scope of the invention to permit a simpler and more precise drive control of the known means.

It is also a scope of the present invention to consent complete manoeuvrability and autonomy.

Another scope of the present invention is the possibility of actuating mini telescopic columns for excavation work in tunnels or in uncomfortable work

sites having scarce useful overhead space.

One further scope of the invention is to permit the digging and executing of inclined excavations.

One other scope is to permit the positioning of the telescopic columns in such a way as to execute excavations at an angle without difficulties nor complicated auxiliary maneouvres of the support means.

These scopes as well as other scopes and various advantages are achieved by the present invention.

The invention is summed up by providing an auxiliary platform, substantially horizontal but inclinable at will at least inthe plane in front of the support means, which in turn sustains a telescopic column by means of plate which is advantageously at least partially rotating.

These improvements permit the elimination of the traditional grider columns and also simplify the installation on the excavator tractor and lead to an improvement of the general and particular efficiency.

The inventionrelates to improvements in telescopic columns for foundations, columns which are sustained and guided by a tractor or other suitable means and which carry terminally thereof the excavating and

work means, characterised by the fact of including in mutual combination and coordination:

- an auxiliary support and positioning platform, at least frontally mobile;
- an at least partially rotating support plate sustained by said auxiliary platform and sustaining the said telescopic column.

There being advantageously provided means of actuating the frontal oscillation of the auxiliary platform, and there being advantageoeusly provided means of actuating the at least partial rotation of the said support plate.

The invention also refers to telescopic columns for foundations adopting such improvements.

We now look into the invention with the aid of the attached tables given by way of example only in which:

Fig. 1 illustrates a crawler tractor carrying a telescopic column according to the invention;

Fig. 2 illustrates an alternative embodiment of the invention for tunnels or work stations with little overhead space;

Fig. 3 shows the invention in an enlarged scale;

Fig. 4 shows the invention as illustrated in fig. 3 according to the sectional view AA;

Fig. 5 shows a vertical section of the invention.

With reference to the drawings, similar parts or parts with similar functions carry similar reference numbers.

In the drawings, 10 generically indicates the machine for excavating the foundation 11 stationed on the terrain 12 and provided in the example with crawler track 13; 14 is the body of the machine which contains the drive organs; 15 is the telescopic column which is axially displaceable forward (or backward)until it reaches the position 115, and laterally displaceable until it at least reaches the angular position 215 and 315 (fig. 4) separated by at least 90; 16 is the platform sustained by the struts 17 and braces 19 (or by the brace) and frontally positioned by at least one jack 18; 17 are the platform support struts which are anchored at 129 to the machine's body 14 and at 29 to the platform 16; 18 is at least one jack which serves to horizontally position said platform 16; 19 are the braces which counteract the struts 17 with which they cooperate at 29 to sustain the platform 16; 20 is the cable which drives the elements of the telescopic column downward; the said cable runs on pulley 30 and then on pulley 31 (both provided on the platform 16) and

then on pulley 25 provided on the front of the central element 228 of the telescopic comumn 15 to eventually rise and terminate at 24 in the external fixed body of the telescopic column; 21 is a bucket of a known type integrally connected to base 26 provided in the frontal body of the central element 328; the actuation of the bucket 21 is done, for instance, by means of the hydraulic conduits 35 enclosed by 23; 22 is the tie bar (or bars) which connects the position 29 of the plattform 16 with the top of the fixed body of the column 15 in order to create a solid articulation system; 23 is the drum for winding the tubes which serves to collect the conduits 35 which actuate the bucket 21, such a drum is connected in a known way to the operating plant which pilots the oil as provided in the machine's body 14; 24 is the anchorage, provided in the external fixed body of the loading cable 20; 25 is the transmission pulley provided in the frontal body of the internal central element 328 of the telescopic column 15; 26 is the base on which are provided the equipment 21, said base is situated in the frontal body of the central internal element 328 of the telescopic column 15; 27 is the support plate which is at least partially rotating and whose rotation can be obtained either

by means of a motor or a jack 32 as shown in the example; the support plate 27 is sustained and guided by the platform 16; 28, 128, 228, 328 are the various components forming the telescopic column 15, the element 28 of the example being sliding on the external fixed body of the column 15 and the element 328 being central while the element 128 and 228 being intermediate; 29 are the attachment means of the platform 16 wherein at least the struts 17 are anchored; 30 is the posterior pulley on which runs the cable; 32 is, in the example, the jack which causes the partial rotation of the support plate 27; 33 is the attachment means of the jack 32 to the support plate; 35 are the actuation conduits, which are known, of the tools 21.

We now look into the way the inventuin works.

To raise the telescopic columns and place it in working position it is advantageously eased on the ground (fig. 1, position 415) then hooked at 219 whereby the braces 19 are connected at 29. The cable 20 is also connected.

By acting on the organ connected by the braces 19, the telescopic column is raised to position 15 or 115 of fig. 1.

By further acting on jack 18, the proper positio-

ning of the column and the platform 16 is achieved..

Then the feed conduits of the fluid under pressure is connected (if not already done) to the winding drum 23.

Consequently the tool 21 is installed on the plate 26 and connected to the pressurized fluid feed conduit as the latter is withdrawn from the drum 23.

By acting in a known manner on the organ provided within the machine 14, the cable 20 is relaxed until the column elements descend lowering thus the tools 21.

The digging tools 21 are then actuated in the usual manner.

To raise the tools, the organ that withdraws the cable 20 is actuated in the usual way which causes the withdrawal of the column elements 28.

In order to longitudinally withdraw the equipment it is sufficient to relax the cable 19 and then act on the jack 18 to move the telescopic column 15 into the required vertical position.

To advance the excavation laterally it is sufficient to drive the machine to the side by means of the craweler tracks 3 (or the wheels).

In the case where an excavation at an angle is

required, it is sufficient to execute the last part with the telescopic column in position 215, and then, by means of jack 32, move into position 315 to immediately obtain the required angle.

Preferential embodiments have been described hereinabove but alternative embodiments are possible, it is thus possible to change the proportions and dimensions; it is possible to add or remove parts; it is possible to mount on base 26 any type of equipment; it is possible to construct a telescopic column of any lenght and number of elements; etc.

These and other alternative embodiments are all possible for a man skilled in the art without having to go beyond the ambit of the inventive concept.

CLAIMS

1 - Improvements in telescopic columns for digging foundations, columns sustained and guided by tractors or other suitable means carring at the end thereof the excavation tools, characterised by including in combination and coordination:

- an auxiliary support and positioning platform which is at least frontally mobile,
- a support plate, which is at least partially rotating, sustained by said auxiliary platform and sustaining the said telescopic column,
- there being advantageously provided means for generating the frontal oscillation of the auxiliary platform and means for generating the at least partial rotation of the said support plate.

2 - Improvements in telescopic columns as in claim 1, characterised by the fact that the auxiliary platform (16) is hingedly sustained by a strut (17), there being a tie means (19) and means of thrust and equilibrium (18) cooperating with said strut (17) for positioning and levelling the said auxiliary platform (16).

3 - Improvements in telescopic columns as in claims 1 and 2, characterised by the fact that the strut means (17) are placed at an extremity of the auxi-

liary platform (16), the means of thrust and equi-
librium (18) being formed of a jack (18) acting in
an at least intermediate position of said auxiliary
platform (16).

4 - Improvements in telescopic columns as in claim
1 and any of the preceding claims, characterised by
the fact that the telescopic column (15) is positio-
ned displaced on the platform (16) in relation to the
attachment of said platform (16) to the strut means
(17).

5 - Improvement in telescopic columns as in claim 1
and any of the preceding claims, characterised by
the fact that the tie means (19) cooperate with
the auxiliary platform (16) in equilibrium with re-
spect to thrust and equilibrium means (18) entering into
action for the temporary locking in the required po-
sition.

6 - Improvements in telescopic columns as in claim
1 and any of the preceding claims, characterised by
the fact that the auxiliary platform (16) sustains
the telescopic column (15) by means of a plate (27);
at least partially rotating and advantageously posi-
tionable at any angle.

7 - Improvements in telescopic columns as in claim
1 and any of the preceding claim, characterised by

the fact that the telescopic column (15) extends on both sides of the auxiliary platform (16).

8 - Improvements in telescopic columns as in claim 1 and any of the preceding claims up and including claim 6, characterised by the fact that the telescopic column (15) extends substantially only in the lower side of the auxiliary platform (16).

9 - Telescopic columns for the excavation of foundations terminally and inferiorly equiped with tools, eventually mounted on self-propelled or similar means of transport, positioning and drive, characterised by adopting one or more of the improvements of the preceding claims.

10 - Improvements in telescopic colums as in claim 1 and any of the preceding claims and telescopic columns adopting such improvements as described and illustrated and for the conceived purposes.

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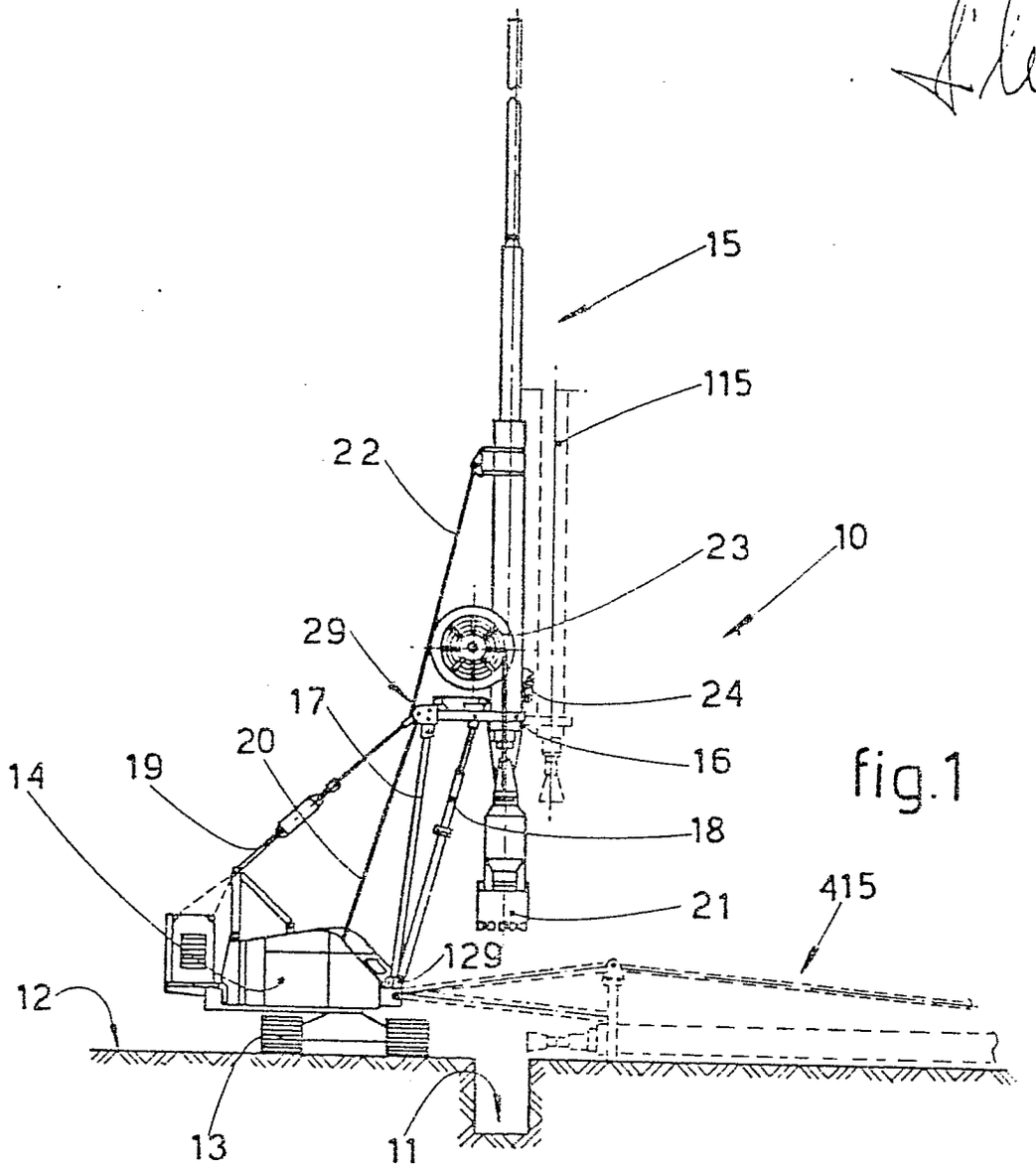

fig.1

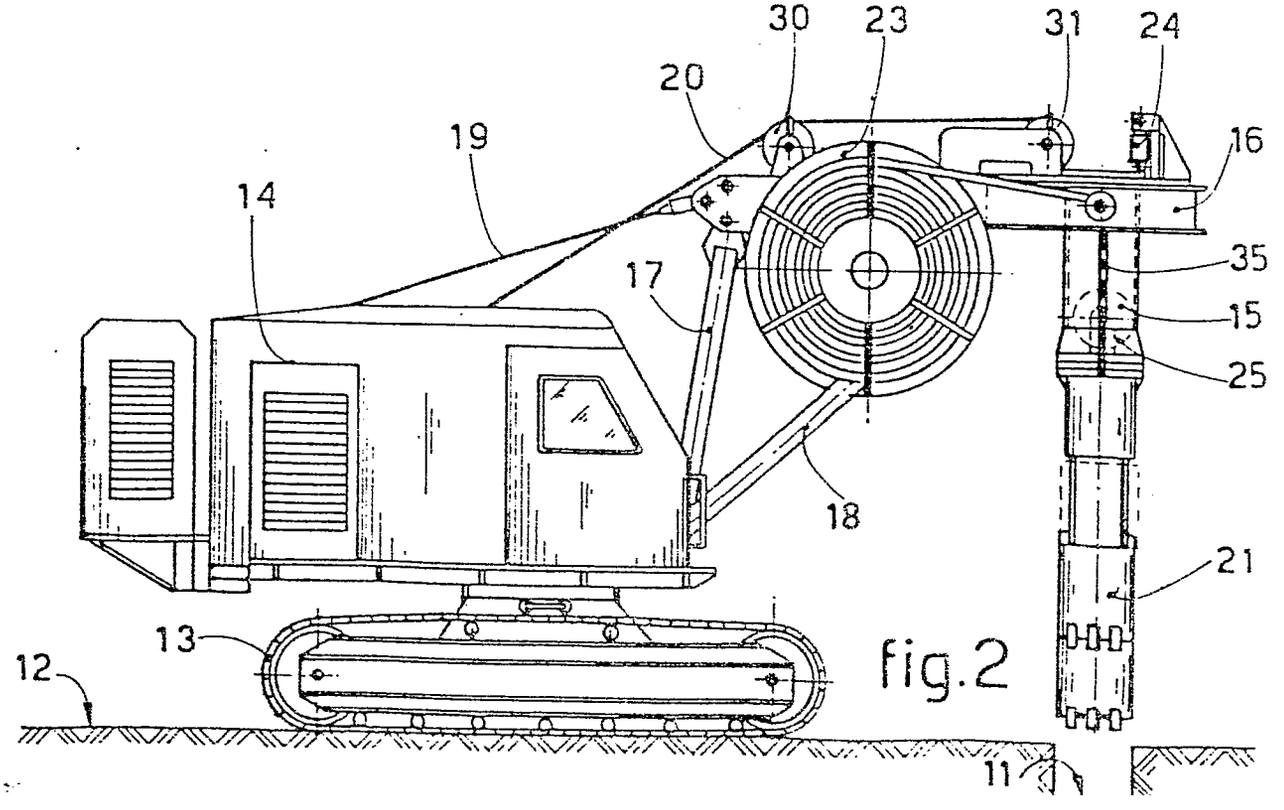

fig.2

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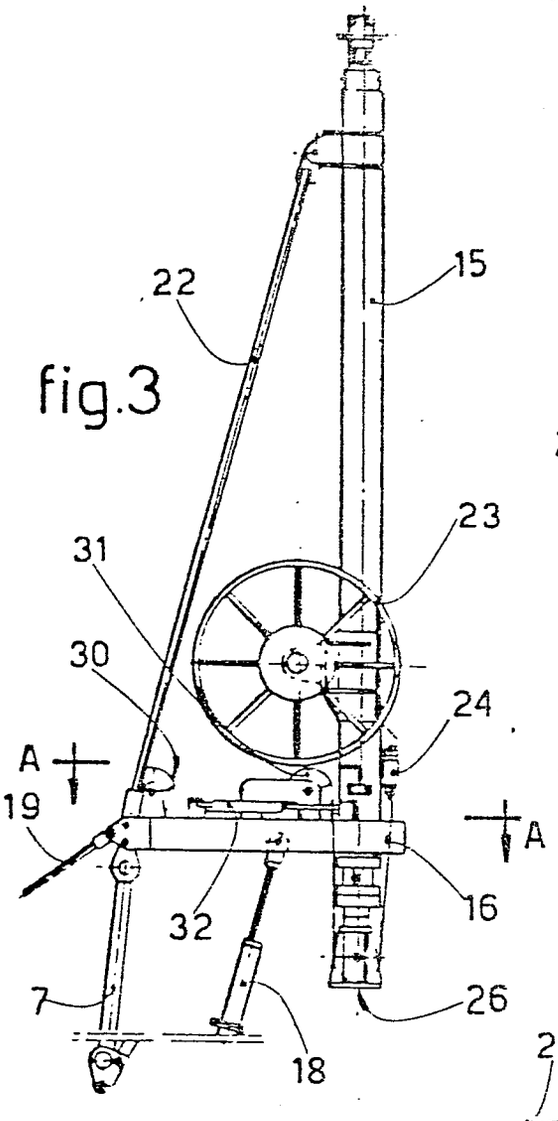
fig.3



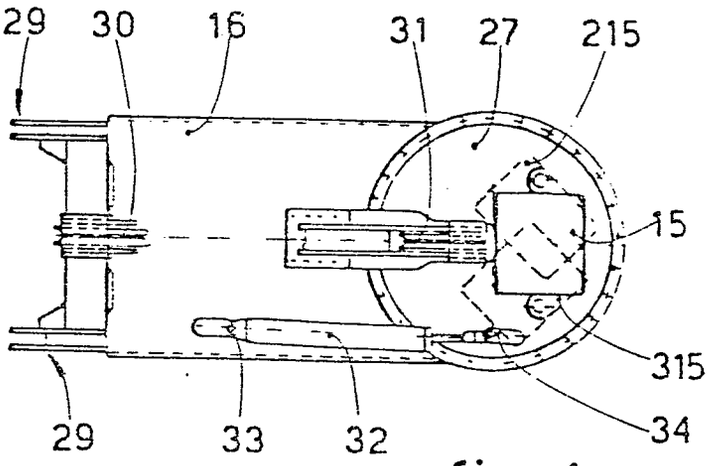


fig.4

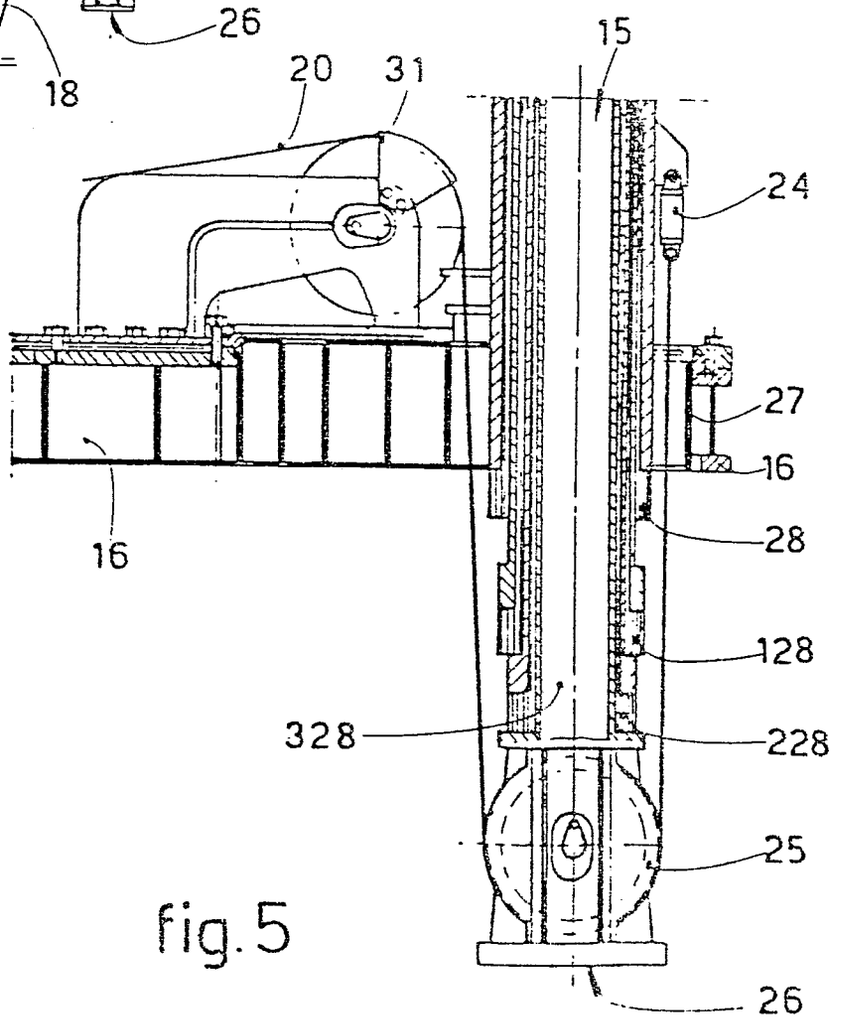


fig.5

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EUROPEAN SEARCH REPORT

Application number
EP 80 83 0006

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
	FR - A - 2 311 921 (BSP INTERNATIONAL FOUNDATIONS) * Page 3, lines 15-25, 33-38; page 4, lines 5-6, 16-20; figures 1,2 *	1-3,9
	US - A - 4 106 225 (SCHNABEL) * Column 2, lines 51-64; column 3, lines 8-18; figures 1-3 *	1
	US - A - 3 875 751 (PAUS) * Column 3, lines 25-34; figures 1,2 *	1
A	FR - A - 2 313 510 (CASAGRANDA)	

CLASSIFICATION OF THE APPLICATION (Int. Cl.)

E 02 F 5/20
9/14
5/20
E 02 D 7/16

TECHNICAL FIELDS SEARCHED (Int. Cl.)

E 02 F
E 02 D
E 21 B

CATEGORY OF CITED DOCUMENTS

X: particularly relevant
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention
E: conflicting application
D: document cited in the application
L: citation for other reasons

&: member of the same patent family, corresponding document

[X] The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	28-05-1980	RUYMBEKE

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