



(11) (21) (C) **2,117,055**
(86) 1992/08/17
(87) 1993/03/18
(45) 2000/10/31

(72) Schnur, Gerald, AT

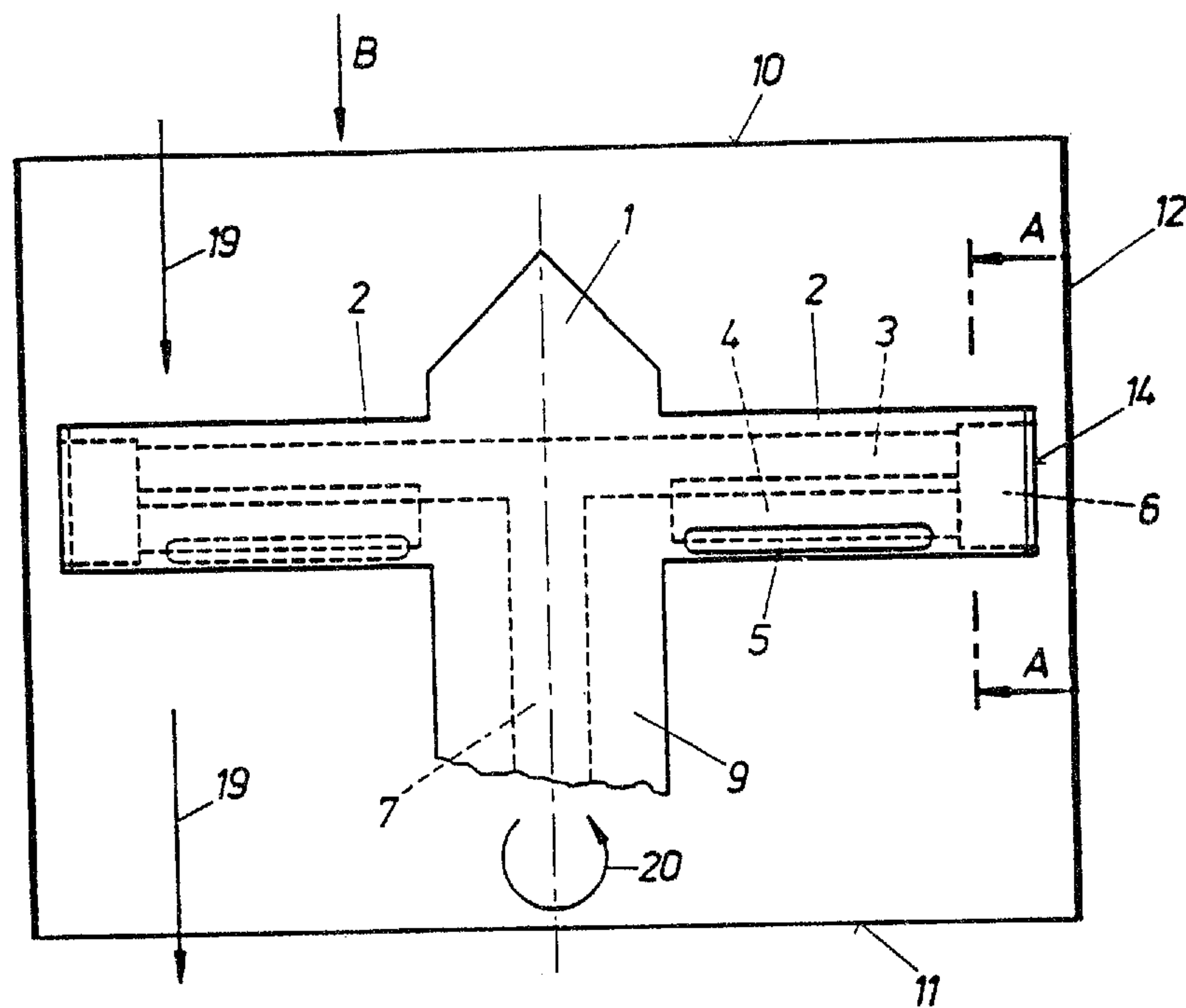
(73) ANDRITZ-PATENTVERWALTUNGS-GESELLSCHAFT M.B.H., AT

(51) Int.Cl.⁵ B01D 19/00, B01D 35/01

(30) 1991/09/06 (A 1772/91) AT

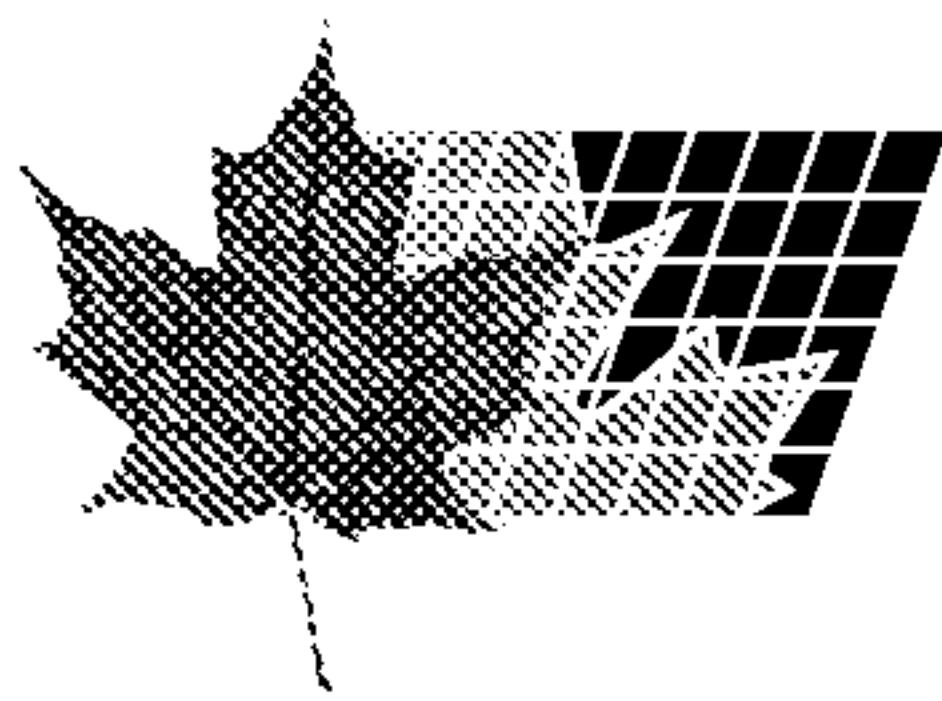
(54) **PROCEDE POUR LA SEPARATION D'ELEMENTS GAZEUX, ET
DISPOSITIF ET INSTALLATION A CETTE FIN**

(54) **PROCESS FOR SEPARATING GASEOUS COMPONENTS FROM
POURABLE MEDIA AND DEVICE AND INSTALLATION
THEREFOR**



(57) L'invention concerne un procédé pour la séparation de constituants gazeux de milieux coulants. L'invention est principalement caractérisée en ce que le mouvement relatif entre les milieux et un élément disposé dans ces milieux a pour effet, du fait du profil de cet élément, de former des zones de dépression et que le gaz qui

(57) The invention relates to a process for separating gaseous components from pourable media. The main feature of the invention is that regions of underpressure are formed by relative movement between the media and a body arranged therein owing to the latter's shape and that the gas collecting in said underpressure regions is



(11) (21) (C) **2,117,055**
(86) 1992/08/17
(87) 1993/03/18
(45) 2000/10/31

s'accumule dans ces zones de dépression est évacué par l'intérieur de l'élément. Un dispositif pour la séparation de constituants gazeux de milieux coulants est caractérisé principalement en ce que le dispositif est conçu pour produire un mouvement relatif entre les milieux et un élément (1) disposé dans ces milieux, élément qui est en particulier prévu pour être rotatif et qui présente un profil qui produit, lors de ce mouvement relatif, des zones de dépression (8) à la surface de l'élément et en ce que l'élément (1) présente, au niveau des zones de dépression (8), au moins une entrée (5) qui est reliée à une évacuation de gaz s'étendant à l'intérieur de l'élément pour l'extraction du gaz séparé. L'invention concerne également une installation associée à l'utilisation du dispositif objet de l'invention.

evacuated via the interior of the body. A device for separating gaseous components from pourable media is primarily distinguished in that it is designed as a device for generating a relative movement between the media and a body (1) arranged therein, said body being, in particular, arranged to rotate and having a contour which produces underpressure regions (8) on the surface of the body during this relative movement and the body (1) has at least one inlet (5) around the underpressure regions (8) which communicates with a gas outlet inside the body to remove the separated gas. The invention also relates to an installation using the device of the invention.

2117055

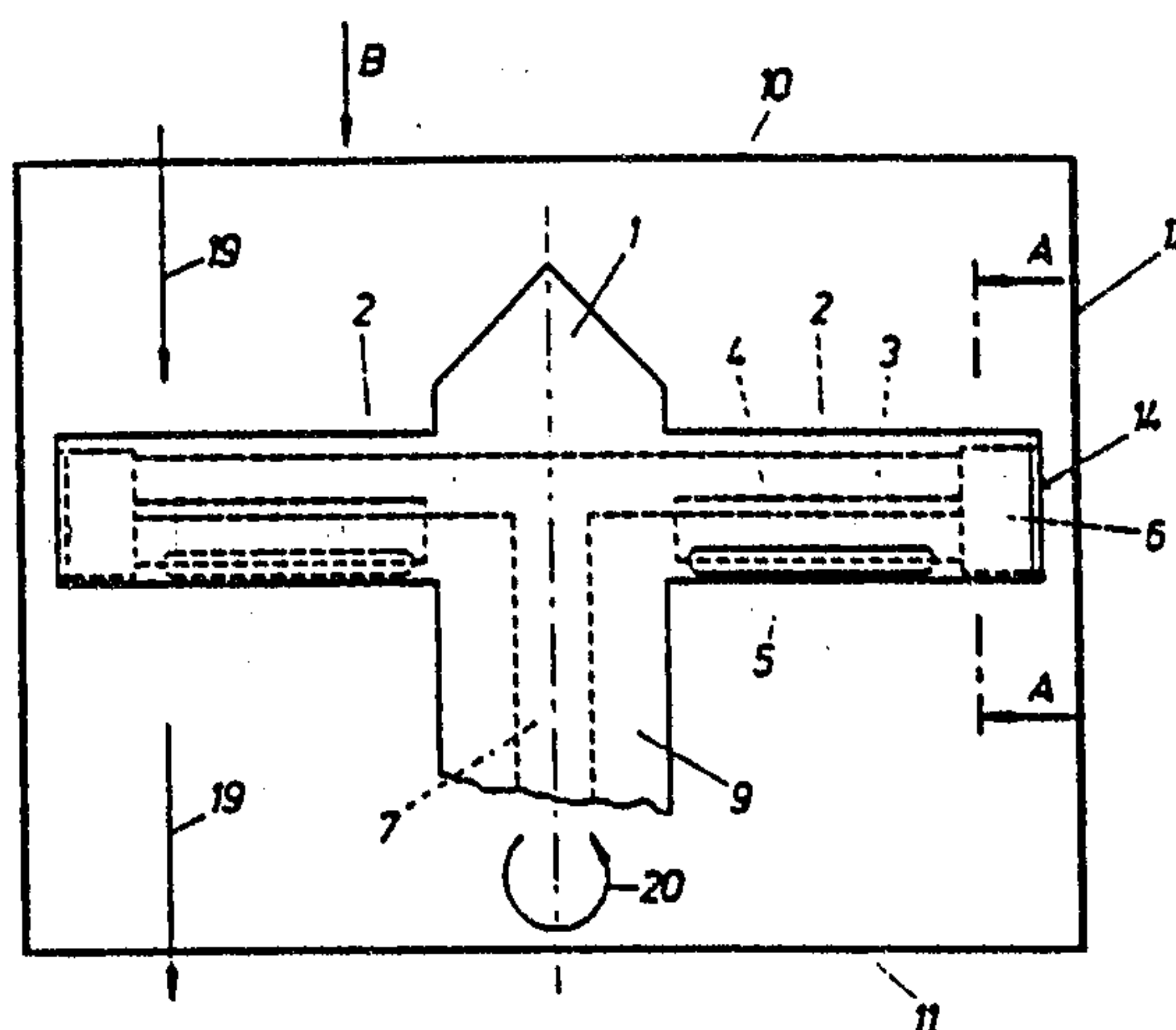


PCT
WELTORGANISATION FÜR GEISTIGES EIGENTUM
Internationales Büro
INTERNATIONALE ANMELDUNG VERÖFFENTLICHT NACH DEM VERTRAG ÜBER DIE
INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT)

(51) Internationale Patentklassifikation ⁵ : B01D 19/00, 35/01	A1	(11) Internationale Veröffentlichungsnummer: WO 93/04757 (43) Internationales Veröffentlichungsdatum: 18. März 1993 (18.03.93)
(21) Internationales Aktenzeichen: PCT/AT92/00113 (22) Internationales Anmeldedatum: 17. August 1992 (17.08.92) (30) Prioritätsdaten: A 1772/91 6. September 1991 (06.09.91) AT (71) Anmelder (für alle Bestimmungsstaaten ausser US): AN-DRITZ-PATENTVERWALTUNGS-GESELLSCHAFT M.B.H. [AT/AT]; Statteggerstraße 18, A-8045 Graz (AT). (72) Erfinder; und (75) Erfinder/Anmelder (nur für US) : SCHNUR, Gerald [AT/AT]; Grazer-Straße 19b, A-8045 Graz (AT). (74) Anwälte: COLLIN, Hans usw. ; Mariahilferstraße 50, A-1070 Wien (AT).		(81) Bestimmungsstaaten: AT, AU, BB, BG, BR, CA, CH, CS, DE, DK, ES, FI, GB, HU, JP, KP, KR, LK, LU, MG, MN, MW, NL, NO, PL, RO, RU, SD, SE, US, europäisches Patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, SE). OAPI Patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, SN, TD, TG). Veröffentlicht <i>Mit internationalem Recherchenbericht.</i>

(54) Title: PROCESS FOR SEPARATING GASEOUS COMPONENTS FROM POURABLE MEDIA AND DEVICE AND INSTALLATION THEREFOR

(54) Bezeichnung: VERFAHREN ZUM ABTRENNEN VON GASFÖRMIGEN BESTANDTEILEN AUS FLIESSFÄHIGEN MEDIEN SOWIE VORRICHTUNG UND ANLAGE DAFÜR



(57) Abstract

The invention relates to a process for separating gaseous components from pourable media. The main feature of the invention is that regions of underpressure are formed by relative movement between the media and a body arranged therein owing to the latter's shape and that the gas collecting in said underpressure regions is evacuated via the interior of the body. A device for separating gaseous components from pourable media is primarily distinguished in that it is designed as a device for generating a relative movement between the media and a body (1) arranged therein, said body being, in particular, arranged to rotate and having a contour which produces underpressure regions (8) on the surface of the body during this relative movement and the body (1) has at least one inlet (5) around the underpressure regions (8) which communicates with a gas outlet inside the body to remove the separated gas. The invention also relates to an installation using the device of the invention.

PROCESS FOR SEPARATING GASEOUS COMPONENTS FROM POURABLE MEDIA AND DEVICE AND INSTALLATION THEREFOR

The invention relates to a process, a device, and an installation using this device for the separation of gaseous components from pourable media, in particular suspensions of solids.

Processes and devices for the separation of gases from liquids, suspensions and liquid-material-gas-mixtures known so far operate on the principle of a centrifuge. Here the medium to be separated from the gas must be set in rotation, the heavier components being enriched at longer radii because of stronger centrifugal forces and the gases and more volatile components mainly at shorter radii and at the center of rotation, respectively. The gas concentrated at shorter radii is then evacuated from the system via an appropriate conduit. In most cases underpressure is applied to the extraction system for the evacuation of gas.

Centrifugal systems of that kind are described in the applicant's Austrian Patent No. 392,216, in U.S. Patent No. 4,326,863 and U.S. Patent No. 4,410,337 and operate with a central rotor carrying mostly rectangular and planar blades or ledges for energy supply running parallel to its axis. According to Austrian Patent No. 392,216 a cage rotor and a substantially central, upwardly directed axial gas discharge pipe are provided. According to U.S. Patent No. 4,326,863 the gas is evacuated in an upward direction through the hollow rotor itself having radial openings, and according to U.S. Patent No. 4,410,337 in a downward direction through a hollow rotor, the rotor having radial passages and being terminated by a disk at its bottom, from which the ribs run upwardly and which has passages for the evacuation of gas corresponding to the internal cavity of the rotor.

A disadvantage of such processes is that energy has to be introduced into the medium for generating swirl, which energy is completely or partly lost in the further course of the process.

A further disadvantage resides in the fact that complicated control is often necessary in order to avoid that a large amount of gas, in particular air, but no other components are separated. This applies in particular when varying amounts of gas occur in the medium to be degassed during operation.

Conventional processes are furthermore disadvantageous in that additional devices aiming at a stabilization of the spout-like gas separation are necessary for efficient operation.

With media and liquid-material-gas-mixtures, respectively, as for instance the suspensions of fibrous material occurring in paper and pulp industry, the gaseous components (mostly air) adhere well to the fiber network, thus making the segregation of gaseous and non-gaseous components (water, fibers, etc.) more difficult. In these cases, it is of major importance to keep the distance the gas has to travel inside the medium in order to reach the zone from where it may be evacuated as short as possible. The result thereof is that with known processes long dwelling times of the medium in the region of the centrifuge are necessary because of the long travel distances, and thus the throughput of the medium is strongly limited or the centrifuge becomes very long.

A further disadvantage of known processes and devices resides in the fact that, in order to prevent the concomitant separation of non-gaseous components, provision has to be made for devices functioning as a sieve. Especially with media likely to form clots, as for instance the fiber suspensions dominating the paper and pulp industry, the components carried along with the evacuated gas may result in clogging. Rinsing means are necessary in order to prevent this.

The present invention avoids the above disadvantages. For this purpose it proposes a process which is characterized in that underpressure zones are formed by relative movement between the media and a body, in particular a rotary body, arranged within these media, as a result of the shape thereof and in that the gas accumulating in the underpressure zones is evacuated via the interior of the body.

The effect of centrifugal force is employed for separating gaseous components from the medium. Advantageously according to the invention the medium enriched with gas, entering the interior of the body together with accumulated gas, is subject to further degassing by centrifugal force inside the body.

Conveniently the medium degassed inside the body is recycled to the medium surrounding the body.

The relative movement between the body and the medium may be achieved by moving the body or the medium, but also by simultaneously moving the body and the medium.

Advantageously according to the invention the relative movement is achieved by preferably continuous rotation of the body.

Conveniently according to the invention the relative movement is achieved by preferably continuous rotation of the body and movement, preferably for conveyance of the medium.

In industrial processes quite frequently media of varying composition, for instance due to changing pressure and temperature conditions, are to be subjected to a treatment. In order to optimize the separation of gas from medium of varying composition, according to the invention the relative speed is adjusted by changing

the speed of movement of the body and/or the medium, in particular in dependence of the state parameters of the medium to be degassed.

Conveniently according to the invention the direction of flow of gas inside the body is changed by deviating it.

Underpressure is applied in order to promote the separation of gas from the medium. Advantageously according to the invention the gas separated from the medium is removed from the interior of the body under application of underpressure.

Conveniently according to the invention the underpressure applied is adjusted in dependence on the state parameters of the medium to be degassed.

The invention also relates to a device for separating gaseous components from pourable media, in particular for carrying out the process according to the present application.

The invention is characterized primarily in that the device for generating relative movement is disposed between the media and a body arranged within these media, which body is in particular provided rotatably and has a shape generating underpressure on the surface of the body in the course of this relative movement, and in that the body has at least one inlet in the region of the underpressure zones, which inlet communicates with a gas discharge for transporting off separated gas.

According to an advantageous embodiment of the invention the body takes the form of a rotary body and the gas discharge has at least one through-channel in the body and open in the region of the radially outer circumference.

Conveniently according to the invention the channel open in the region of the radially outer circumference discharges into an enlarged cavity, preferably in the region of the radially outer circumference.

Advantageously according to the invention the channel open in the region of the radially outer circumference communicates with a further channel, optionally via an enlarged cavity.

Conveniently according to the invention the body has several arms. Advantageously according to the invention several arms are arranged in one plane.

According to the present invention it may also be convenient for the arms to be arranged in at least two planes with respect to the rotational axis, preferably above each other.

Conveniently according to the invention the gas discharge opens into a collecting channel.

According to an advantageous embodiment of the invention the gas discharge communicates with a gas evacuation device, in particular a suction device, preferably via the collecting channel.

In order to promote the evacuation of gas from the medium the body of appropriate shape is moved. According to an advantageous embodiment of the invention the body and the arms, respectively, is/are connected to a drive device, in particular to a drive shaft.

Conveniently according to the invention the collecting channel is arranged in the drive shaft. Preferably according to the invention the collecting channel is arranged between hub and shaft.

The configuration of the entrance opening on the body exerts a major influence on the efficiency of the separation of gas from the medium. Conveniently according to the invention at least one inlet is of circular cross section. Preferably at least one such inlet is formed as a bore.

Conveniently according to the present invention several such bores are, at least substantially in a radial direction, arranged adjacent to each other on the body.

According to the present invention it is also advantageous for several such bores to be arranged adjacent to each other on the body, at least substantially in parallel to the rotational axis.

According to a preferable embodiment of the invention at least one inlet takes the form of a slot. Conveniently the at least one slot-like inlet is oriented in the radial direction.

Preferably according to the invention the at least one inlet has a cross section widening in the direction towards the interior of the body, preferably in a continuous fashion.

According to an advantageous embodiment of the invention at least one additional profile being oriented at least substantially in parallel to the rotational axis is provided in the region of the radially outer circumference.

The invention also relates to an installation using the device for separating gaseous components from pourable media, in particular solid suspensions, described above. Conveniently according to the invention the device is arranged within a housing. According to another advantageous embodiment of the invention the device is arranged in a channel, in particular a pipe, a bent and a curved pipe, respectively.

Conveniently according to the invention the device is arranged in an oblique position in the housing and channel, respectively.

Advantageously according to the invention the device is arranged in an eccentric position in the housing and channel, respectively.

According to an advantageous embodiment of the invention the device is arranged downstream of a container and protrudes at least partly from the housing and channel, respectively, into the container.

Conveniently according to the invention the device is arranged upstream of a pump.

Advantageously according to the present invention the device is directly connected to the shaft of the pump. According to a preferably embodiment of the invention the device takes the form of a pump rotor vane.

The invention will now be described by way of the exemplary embodiments in the drawings, wherein

Fig. 1 shows a side view of a device according to the invention,

Fig. 2 shows a plan view in direction B according to Fig. 1,

Fig. 2a shows a plan view of a further device according to the invention,

Fig. 3 shows section A-A according to Fig. 1 as well as flow lines of the medium,

Figs. 3a and 4a show a plan view of a device according to the invention with flow lines shown,

Figs. 4b to 11 show side views of diverse variants of the type and place of positioning of suction openings,

Fig. 12 shows a side view of a variant of the invention having additional elements for generating a centrifugal effect,

Figs. 13 to 15 show side views of variants of the assemblage of the device in an installation,

Figs. 16 and 17 show vertical sections of variants of the device directly connected to a pump shaft,

Figs. 18 and 19 show side views of variants for arranging the device upstream of a pump,

Fig. 20 shows a side view of a variant for discontinuous use of the device,

Fig. 21 shows a side view illustrating the incorporation of the device in a pump rotor vane, and

Fig. 22 shows section C-C according to Fig. 21.

Fig. 1 shows a side view of a device according to the invention which essentially consists of a body 1 having arms 2 extending radially outwards, each of which is provided with channels 3 and 4, an inlet 5 and a cavity 6 opening outwardly, so that there is a connection to space 13 where the medium to be degassed is located. The suction opening or inlet 5 connects space 13 to channel 4, which is in turn connected to cavity 6. Channel 3 connects cavity 6 to the suction conduit or collecting channel 7. Body 1 is connected to a drive shaft 9, so that the whole

device rotates in direction 20 in a housing 12 the medium may enter through an opening 10 and from which the medium may exit through an opening 11.

Fig. 2 shows a plan view of the device, similar parts being indicated with the corresponding reference numerals according to Fig. 1. An embodiment having three arms 2 is shown in plan view in Fig. 2a.

Section A-A according to Fig. 1 is shown in Fig. 3. Fig. 3a shows a plan view of a device according to the invention, this figure giving, on the one hand, media flows and, on the other hand, important operation and device parameters. With reference to these figures the process is to be explained in more detail now. Rotation of the device generates a relative speed R between the medium to be degassed and the arms 2. The medium now flows around arms 2 in direction 19, generating underpressure zones 8 having a pressure p_3 in certain locations of the arms 2 and in its surroundings, where the gas or gas-enriched medium accumulates because of its low specific density. The relative speed R is chosen so that it results in a sufficient pressure difference ($p_1 - p_3$) to cause the separation of gas. Here the relative speed R is determined by the number of revolutions n as well as the radial dimensions (l_1, r_2, r_3, l_3, l_4), the number of revolutions being higher than a minimum value of about 200 - 300 rpm. The gas or gas mixture accumulated in the underpressure zones 8 subsequently, via inlet 5, enters channel 4 and furthermore cavity 6. Pressure p_2 prevailing in collecting channel 7 is set so that it is lower than pressure p_3 of underpressure zones 8. In this cavity 6, due to the higher centrifugal force prevailing there, the gas or gas-enriched medium is effectively completely separated from non-gaseous components possibly present. The separated components are again recycled to the medium flow through the outer end of cavity 6. The purified gas enters the collecting channel 7 via channel 3. With appropriate design of the device and choice of operation parameters (e.g. number of revolutions, underpressure) no control is necessary during operation. This results in high safety of operation even with highly varying operating

conditions and markedly different compositions of the liquid-material-gas-mixture.

Advantageously inlet 5 is formed so that it results in the evacuation of gas over a certain area by a large radial extension and thus keeps the distance the gas has to cover in the medium in order to reach the zone of suction short. With media which are difficult to degas the distance may be kept correspondingly short by increasing the number of revolutions n in order to achieve effective degassing anyhow.

The separation of non-gaseous components from the gas by differing centrifugal forces of the components caused by the differences in density takes place in cavity 6. Separation is effected at a distance l_4 from the center of rotation. The forced dislocation of the process of separation to a relatively large distance l_4 from the center of rotation as compared to known processes with the formation of spouts near the center of rotation results in extremely good separation of the components. The (solid and liquid) components separated from the gas are recycled to the medium via the cavity 6 open towards the outside. The gas is redirected and evacuated from the device via channel 3 and collecting channel 7. For the functioning of the device wherein the gas is redirected there is a lower limit of dimension r_2-l_3 or cavity 6. This is, on the one hand, determined by the fact that the medium enters the cavity 6 because of the pressure difference p_1-p_2 (external pressure of the medium minus pressure in collecting channel 7). Due to the rotation a counterpressure is generated by the centrifugal forces until a penetration depth of the medium of l_1-l_4 has been reached, where a pressure equilibrium comes about. On the other hand, the cross sectional area of the cavity 6 between l_4 and l_3 is to be kept so large that the gas may unrestrictedly pass from channel 4 to channel 3.

The pressure drop from outer space 13 via cavity 6 into channel 3 or 7 may be promoted by appropriately forming the outer contour 14 of body 1 and arms 2, respectively, if, for instance, the outer contour 14 takes such a form that the radial extension of arms 2 decreases in the direction opposite the direction of rotation, thus creating an underpressure zone 8 in this region. Because of the underpressure zone 8 the medium cannot penetrate into the cavity 6 as deeply as this would be the case with a cylindrical outer contour 14.

Thus with this process, even in case of varying operating conditions, no control activities are necessary; instead, effective degassing of the medium at high operating reliability takes place because of the practically delay-free procedure even in case of highly unsteady operating conditions. Even in the extreme case of the medium being completely free of gas no non-gaseous components may get out of the system if the dimensions and operative parameters are chosen appropriately. In this case the medium flows into channel 4 via inlet 5 and returns to the outer space 13 via cavity 6.

The medium is conveyed by appropriately shaping the arms 2 and angles α and β , receptively, with respect to the rotational axis. The angles α and β , respectively, are chosen in dependence on the amount of throughput of medium to be degassed, the number of revolutions, and the desired conveyance behaviour, and with one embodiment of the rotor vane type may differ as to the radius. Ordinarily angle $\alpha \geq \beta$.

The cross section of inlet 5 and its course, respectively, may be different. Thus Fig. 4a in plan view and Fig. 4b in side view, respectively, show a slot-like inlet 5, extending over the total length of arm 2. Fig. 4a again shows the individual media flows (liquid-material-gas-mixture, gas, non-gaseous components). By way of example Fig. 5 shows diverse configurations of inlet 5, these being employable alone as well as in combination. It illustrates bores 5' arranged near shaft 9 and

ending, on the one hand, in a channel 4 and, on the other hand, in a cavity 6. Furthermore slot-like openings 5" are shown, the direction of which is tangential to the direction of movement and in any oblique arrangement thereto, respectively, this choice depending on the material parameters of the medium and the other operating conditions. If the non-gaseous components may be separated easily, channels 3 and 4 may be short as shown in Fig. 5 or a single cavity may perform the function of channels 3, 4 and of cavity 6 (Fig. 6). The cross section of inlets 5, having the form of bores in Fig. 6, increases in the direction of cavity 3, 4, 6 and this is how clogging by non-gaseous components carried along is prevented.

In case of minor amounts of gas to be separated the cavity 6 may also be very small (Fig. 7). Also, as shown in Fig. 8, channels 3 and 4 may be directly connected via opening 3'. Fig. 8 furthermore shows a variant of how to form the collecting channel 7, which in this case surrounds shaft 9 as an annular gap.

Fig. 9 and the plan view thereof in Fig. 10 show an embodiment with media that are difficult to degas or large amounts of gas to be evacuated. Here body 1 is provided with additional portions 2' or 2" having openings 5' and 5", respectively, (shown as bores here, but also possible in slot-like configuration), which communicate with cavity 6 via channels 4' and 4", respectively, or optionally via a channel 4.

Fig. 11 shows a further embodiment of the device having an additional portion 2''' and a channel 4'', suction from the underpressure zone 8 taking place via inlets 5.

Fig. 12 illustrates a variant of the device according to the invention, combining the process according to the invention with the known processes employing centrifugal effect. Elements 15 are provided here, which are able to degas the medium in the outer peripheral region up to about r_1 according to the principle of a centrifuge. Appropriate portions 16 may be provided for stiffening purposes.

The advantage of this embodiment resides in the fact that the length of the construction is considerably shortened as compared to known devices and that no gas separation has to take place within the area of r_1 . Thus the distance to be covered by the gas to be separated is considerably reduced. The elements for stabilizing the spout as well as the necessity for elaborate control may be dispensed with as well. The individual gas velocity components are illustrated here as well, namely in axial direction the same speed as medium c_1 , in radial direction component c_2 depending on the medium to be degassed and the operative parameters, and the velocity component c_3 resulting therefrom in the direction of the center of rotation. Because of the evacuation of gas over a certain area inside radius r_1 the otherwise necessary length of a centrifuge of l_2 is reduced to l_1 . As no spout-like gas separation near the center of rotation has to be done, no elements for the stabilization thereof are necessary either. Because of the efficient separating function, the sieves or the like used so far may be dispensed with as well.

Figs. 13 to 15 show various arrangements of the device according to the invention in a housing 12 which is ordinarily disposed below a container to be evacuated. Fig. 13 differs from Fig. 14 in that in Fig. 13 the device is completely contained in the housing 12, while the device of Fig. 14 protrudes at least partly into the container arranged thereabove.

Fig. 15 shows the arrangement of the device in housing 12 with an oblique shaft 9.

In Figs. 16 and 17 the device is directly connected with the shaft 9 of a pump arranged downstream thereof, the collecting channel 7 in Fig. 16 being provided centrally in the shaft 9 and sucked off via an annular chamber 17. By contrast, in Fig. 17 suction takes place via an annular gap 7'.

Figs. 18 and 19 show arrangements of the device in a housing 12 to which pump 18 is directly connected.

If a liquid-material-gas-mixture is to be degassed discontinuously, an arrangement according to Fig. 20 is used.

Fig. 21 shows an embodiment wherein the device is directly integrated into the pump rotor vane. Fig. 22 shows a section C-C according to Fig. 21.

Basically body 1 of the device may also take a form so as to achieve a conveying effect on the medium.

The illustrated embodiments of the invention only serve as examples and may be modified by one skilled in the art within the scope of the claims.

CLAIMS

1. A process for separating gaseous components from pourable media, by relative movement between the medium and a body (1) situated therein, characterized in that the pourable medium moves along the surface of this body having the configuration of a vane forming underpressure zones, and in that the gas-enriched medium accumulating in these underpressure zones is directed into the interior of the body through at least one opening, which is arranged in this region and directed out of it, and the medium degassed in the interior body is recycled into the medium surrounding the body in the region of the outer periphery of the body.
2. The process according to claim 1, characterized in that gas-enriched medium, entering the interior of the body jointly with accumulated gas, is subjected to further degassing by centrifugal force inside the body.
3. The process according to any of claims 1 or 2, characterized in that the relative movement is achieved by rotating the body.
4. The process according to any of claims 1 or 2, characterized in that the relative movement is achieved by rotation of the body and movement of the medium.
5. The process according to any of claims 1 to 4, characterized in that the relative movement is adjusted by changing speed of movement of the body and/or the medium.
6. The process according to claim 5, characterized in that the relative movement is adjusted in dependance on the state parameters of the medium to be degassed.

7. The process according to any of claims 1 to 6, characterized in that the direction of flow of gas inside the body is changed by deviating it.
8. The process according to any of claims 1 to 7, characterized in that the gas separated from the medium is evacuated from the interior of the body by applying underpressure.
9. The process according to claim 8, characterized in that the underpressure applied is adjusted in dependance on the state parameters of the medium to be degassed.
10. A device for separating gaseous components from pourable media adapted for the generation of relative movement between the media and a body (1) arranged in these media, characterized in that the body (1) has the configuration of a vane, which causes underpressure zones (8) on the surface of the body in the course of this relative movement, and in that the body (1) has at least one inlet (5) in the region of the underpressure zones (8), which inlet communicates with a gas discharge running inside the body for transporting off separated gas and the gas discharge has at least one channel (4) going through the body (1) and open in the region of the outer radial periphery.
11. The device according to claim 10, characterized in that the body (1) is provided rotatably.
12. The device according to any of claims 10 or 11, characterized in that the body (1) is formed as a rotary body.

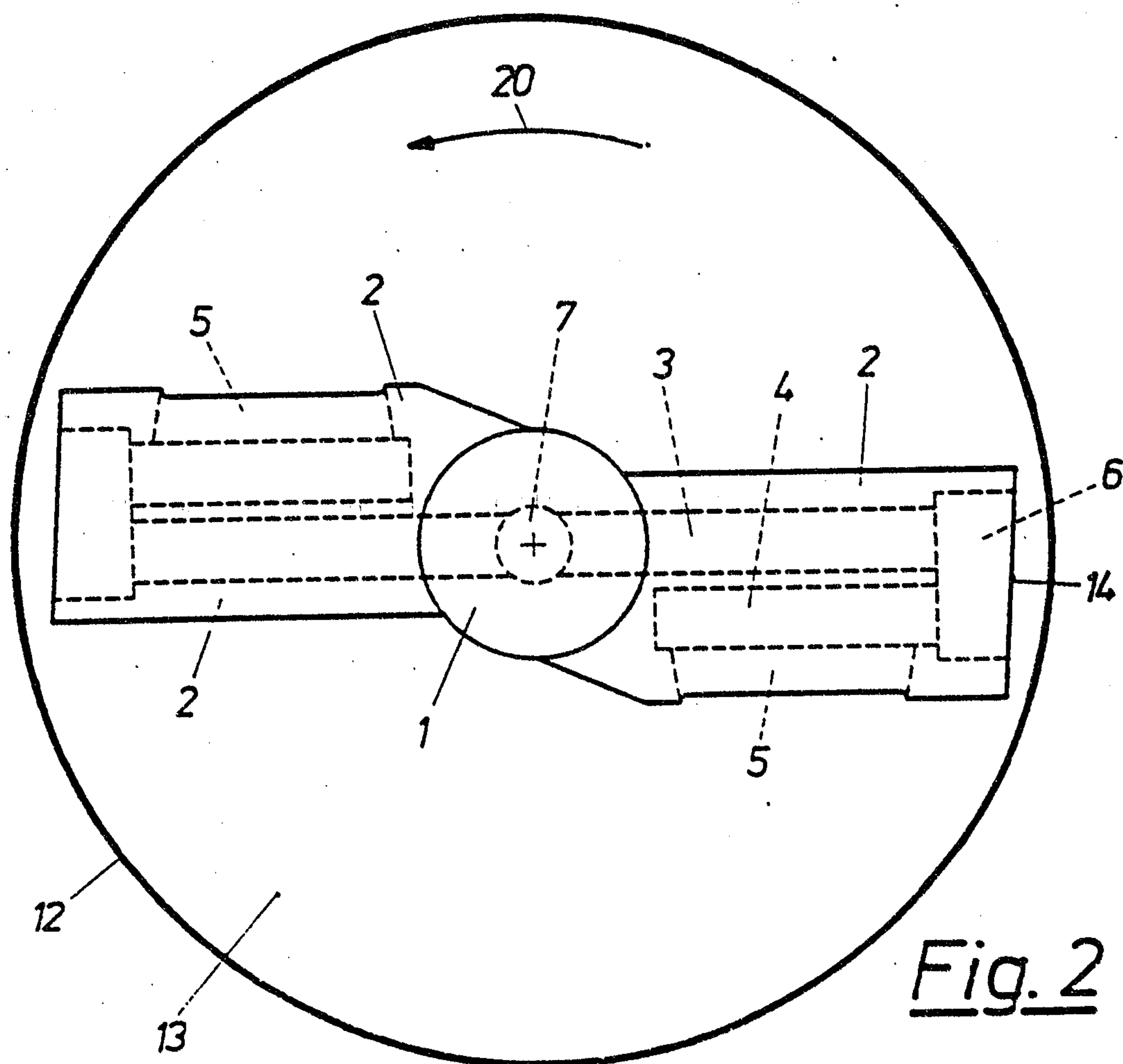
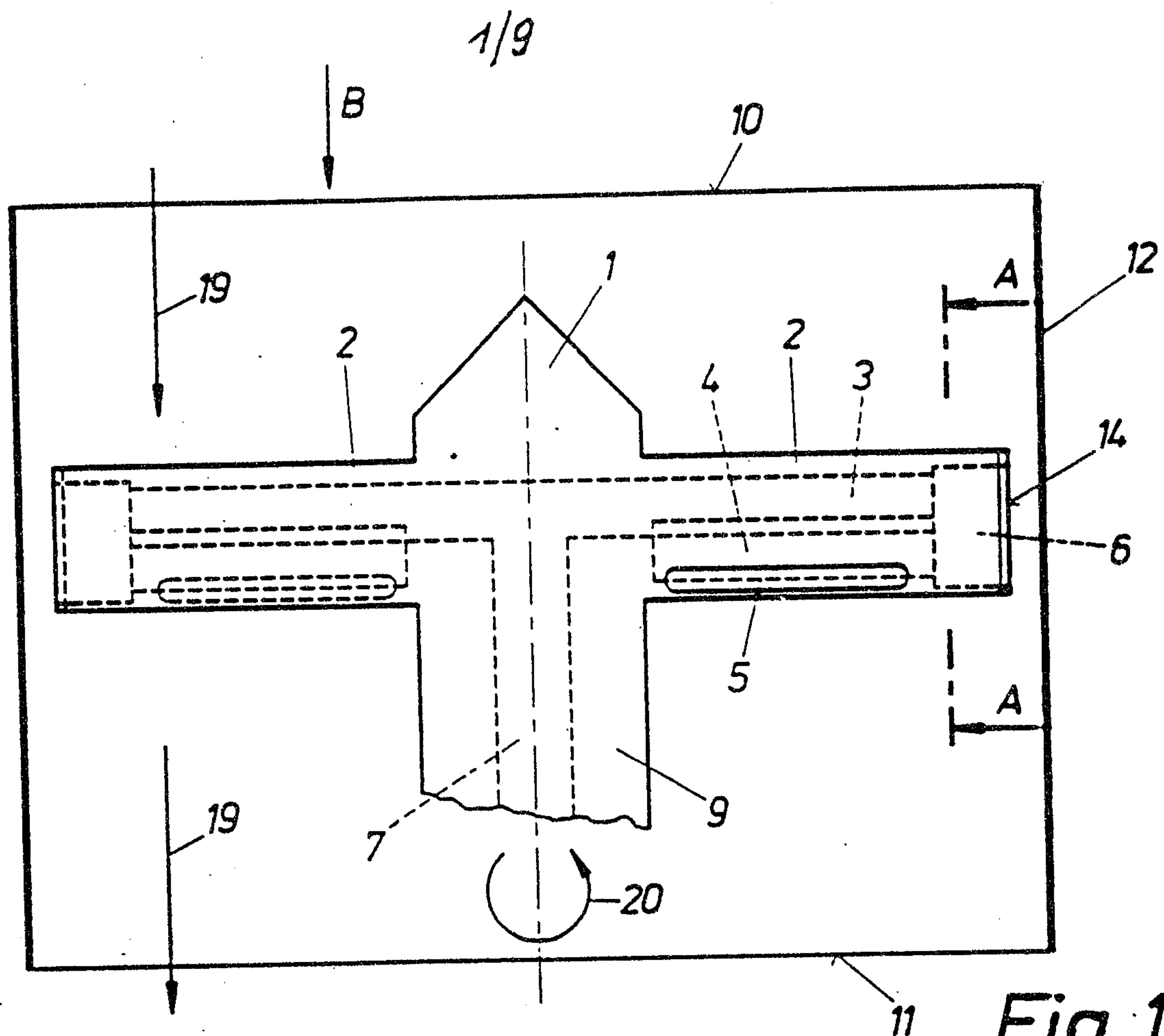
13. The device according to any of claims 10 to 12, characterized in that the channel (4) open in the region of the radially outer circumference discharges into an enlarged cavity (6).
14. The device according to any of claims 10 to 13, characterized in that the channel (4) open in the region of the radially outer circumference of the body (1) communicates with a further channel (3), optionally via the enlarged cavity (6).
15. The device according to any of claims 10 to 14, characterized in that the body (1) has several arms (2).
16. The device according to claim 15, characterized in that several arms (2) are arranged in one plane.
17. The device according to claim 15, characterized in that the arms (2) are arranged in at least two planes with respect to the rotational axis.
18. The device according to any of claims 10 to 17, characterized in that the gas discharge opens into a collecting channel (7).
19. The device according to any of claims 10 to 18, characterized in that the gas discharge communicates with a suction device.
20. The device according to any of claims 15 to 19, characterized in that the body (1) and the arms (2), respectively, are connected to a drive device (9).
21. The device according to claim 20, characterized in that the drive device is a drive shaft.

22. The device according to claim 21, characterized in that the collecting channel (7) is arranged in the drive shaft (9).
23. The device according to claim 21, characterized in that the collecting channel (7) is arranged between a hub and a shaft.
24. The device according to any of claims 10 to 23, characterized in that at least one inlet (5) is of circular configuration.
25. The device according to claim 24, characterized in that at least one inlet (5) is formed as a bore.
26. The device according to claim 25, characterized in that several bores are, at least substantially in a radial direction, arranged adjacent to each other on the body (1).
27. The device according to claim 24, characterized in that several bores are arranged adjacent to each other on the body (1), at least substantially in parallel to the rotational axis.
28. The device according to any of claims 10 to 26, characterized in that at least one inlet (5) takes the form of a slot.
29. The device according to claim 27, characterized in that at least one slot-like inlet (5) is oriented in the radial direction.
30. The device according to any of claims 10 to 28, characterized in that the at least one inlet (5) has a cross-section widening in the direction towards the interior of the body.

31. The device according to claim 29, characterized in that the cross-section widens continuously.
32. The device according to any of claims 10 to 30, characterized in that at least one additional body being oriented at least substantially in parallel to the rotational axis is provided in the region of the outer radial periphery.
33. An installation for separating gaseous components from pourable media, by relative movement between the medium and a body, in particular rotatable, positioned therein, characterized in that provision is made for a device having a body (1) with vane-like configuration, this body having at least one channel (4) running through the body (1), at least one inlet in a zone of underpressure of the device, and open in the region of the outer periphery of this body (1) and the device is arranged in a container (12) or in a channel, a bent and a curved pipe, respectively.
34. The installation according to claim 32, characterized in that the device is arranged in an oblique position in a housing (12) and channel, respectively.
35. The installation according to claim 33 or 34, characterized in that the device is arranged in an eccentric position in the container (12) and channel, respectively.
36. The installation according to any of claims 33 to 35, characterized in that the device is arranged downstream of a container and protrudes at least partly from the container (12) and channel, respectively, into the container.
37. The installation according to any of claims 33 to 36, characterized in that the device is arranged upstream of a pump (18).

38. The installation according to claim 37, characterized in that the device is directly connected to the shaft of the pump (18).

39. The installation according to claim 38, characterized in that the device takes the form of a pump rotor vane.



2/9

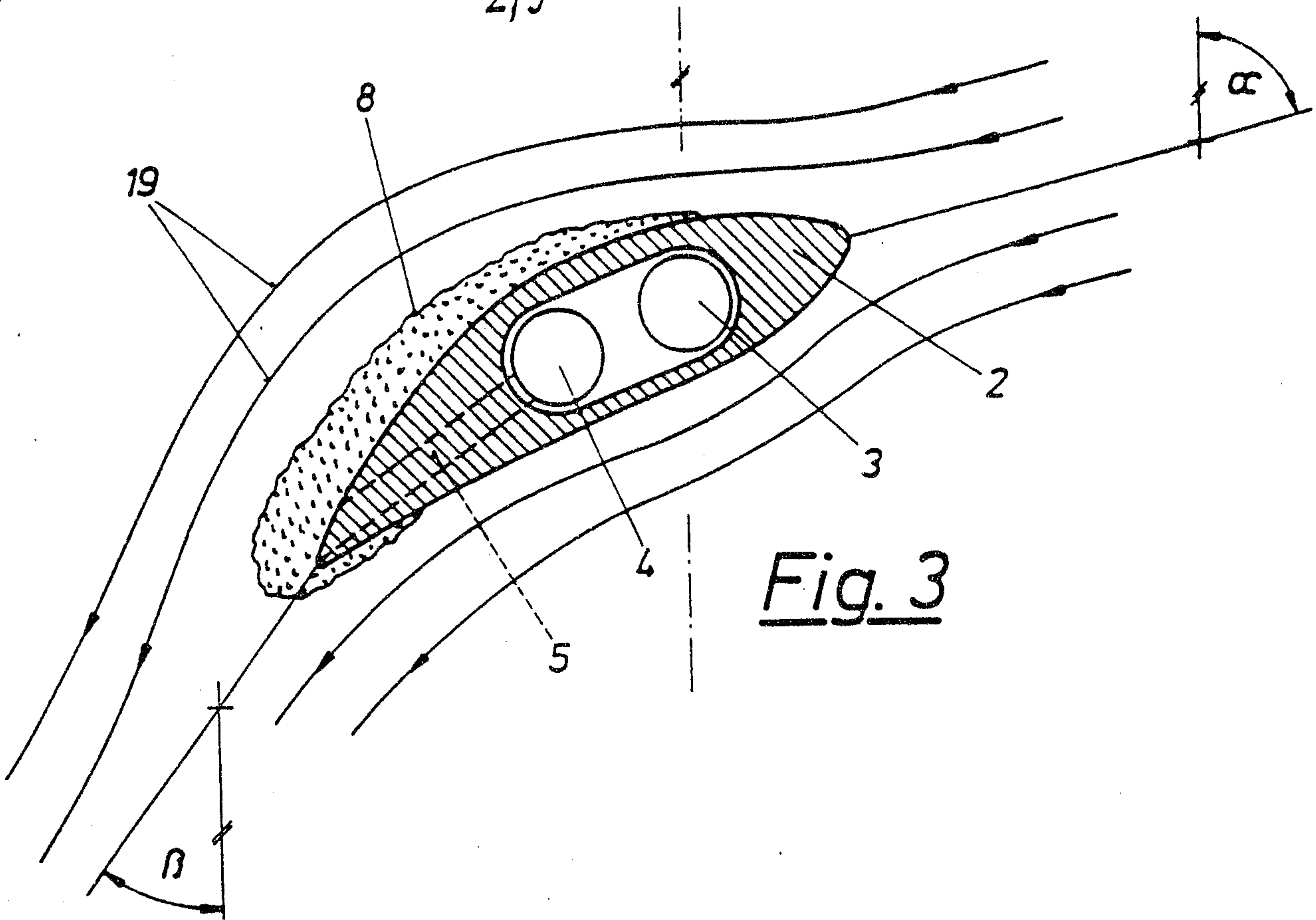
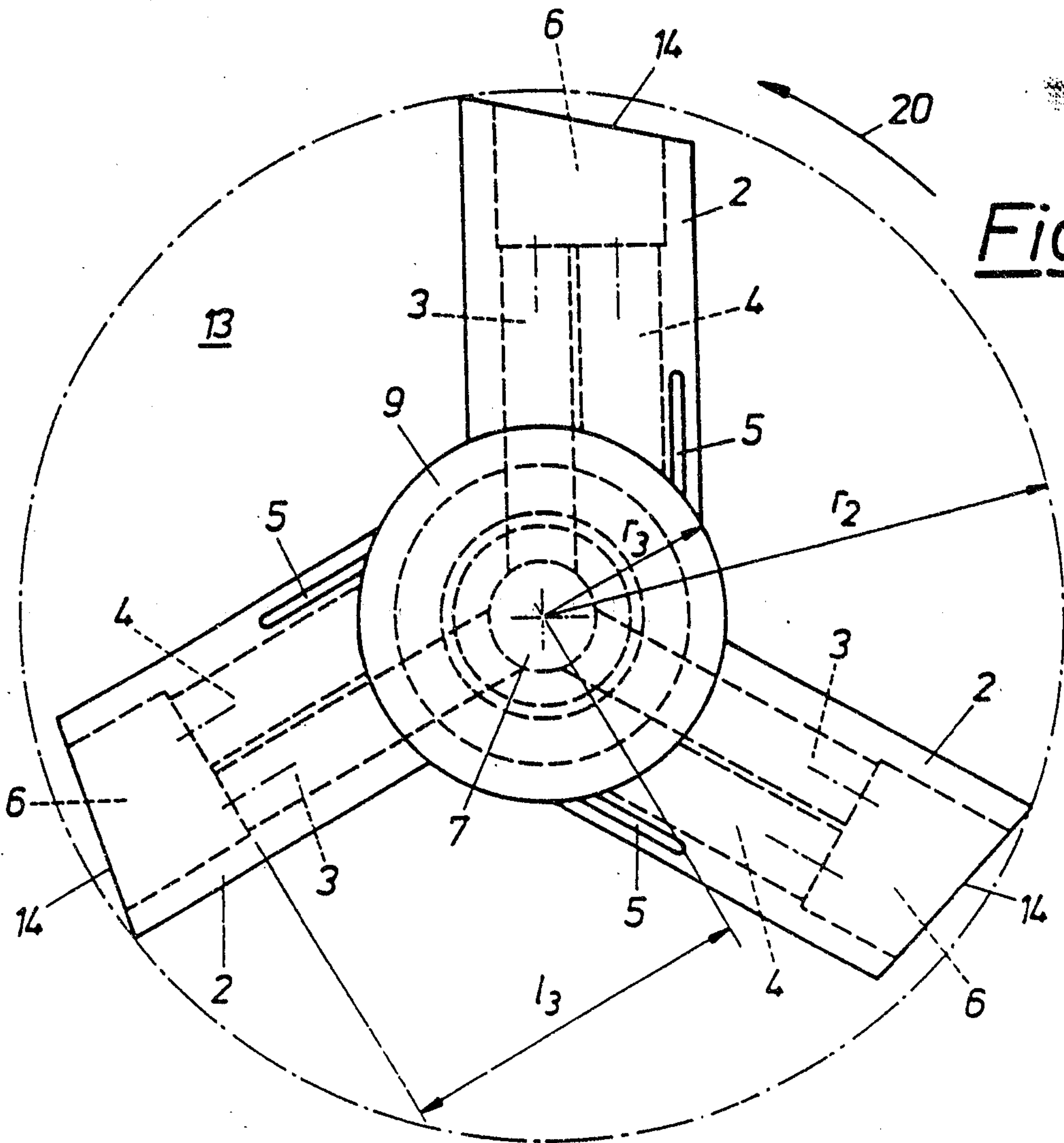
Fig. 3Fig. 2a

Fig. 3a

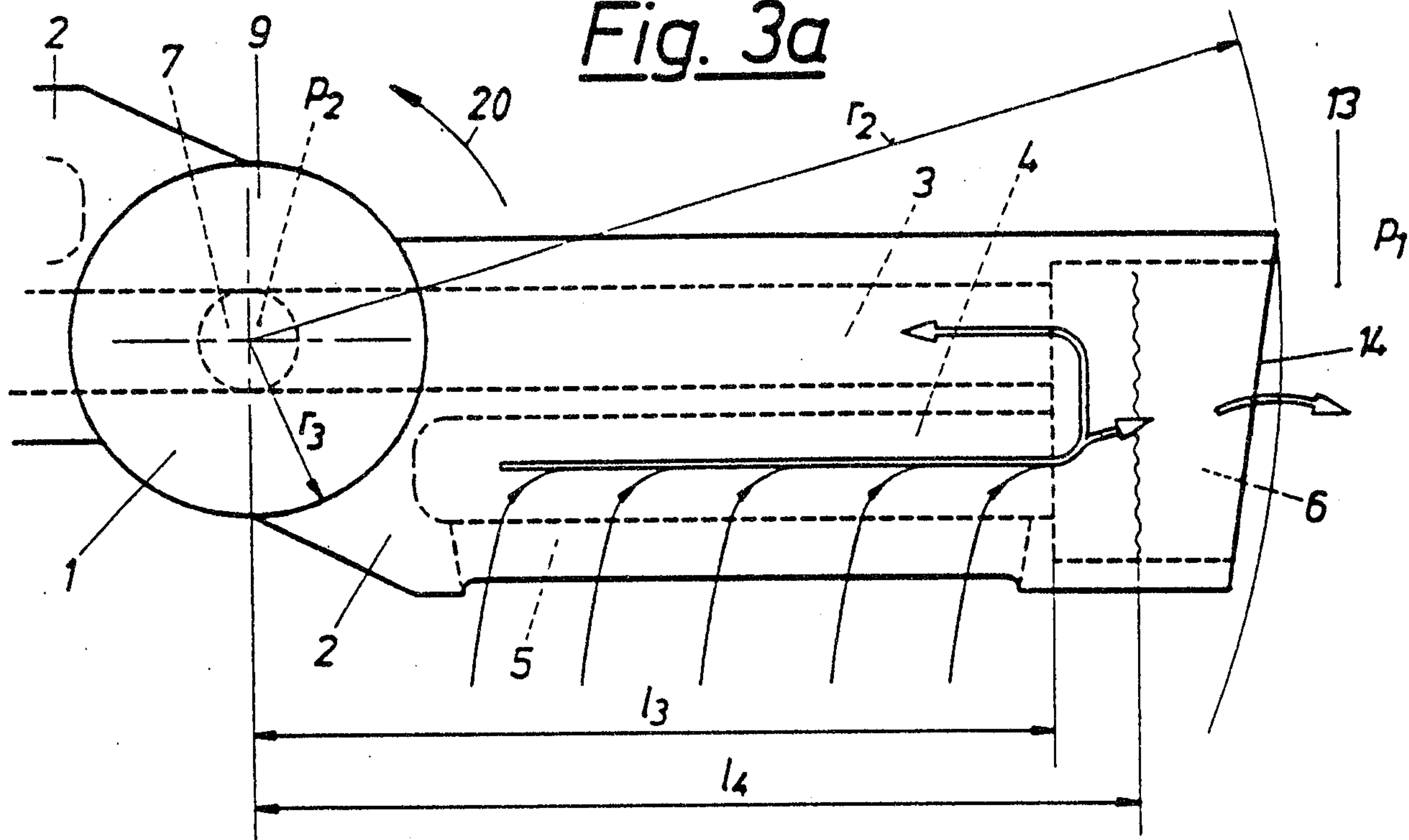


Fig. 4a

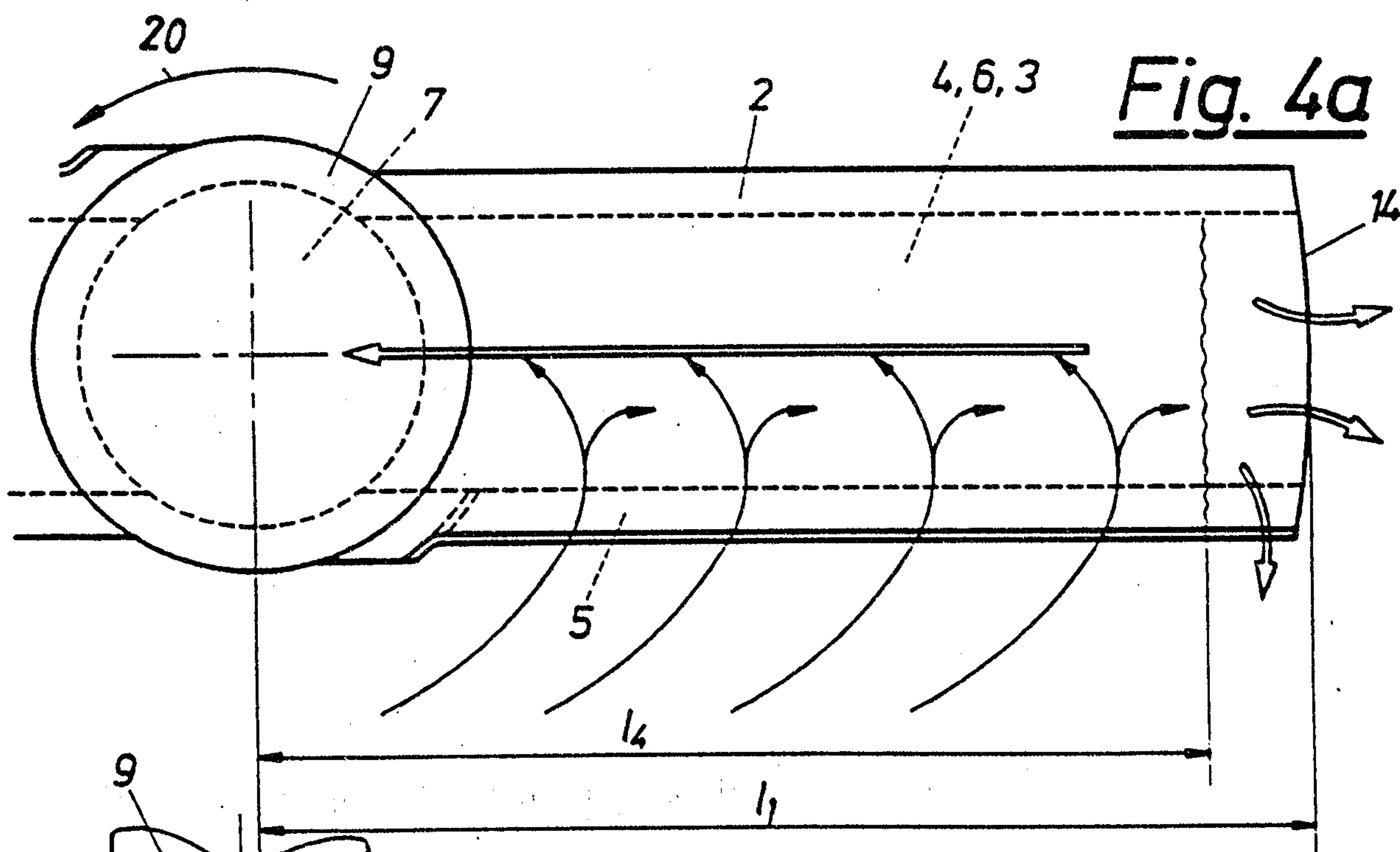


Fig. 4b

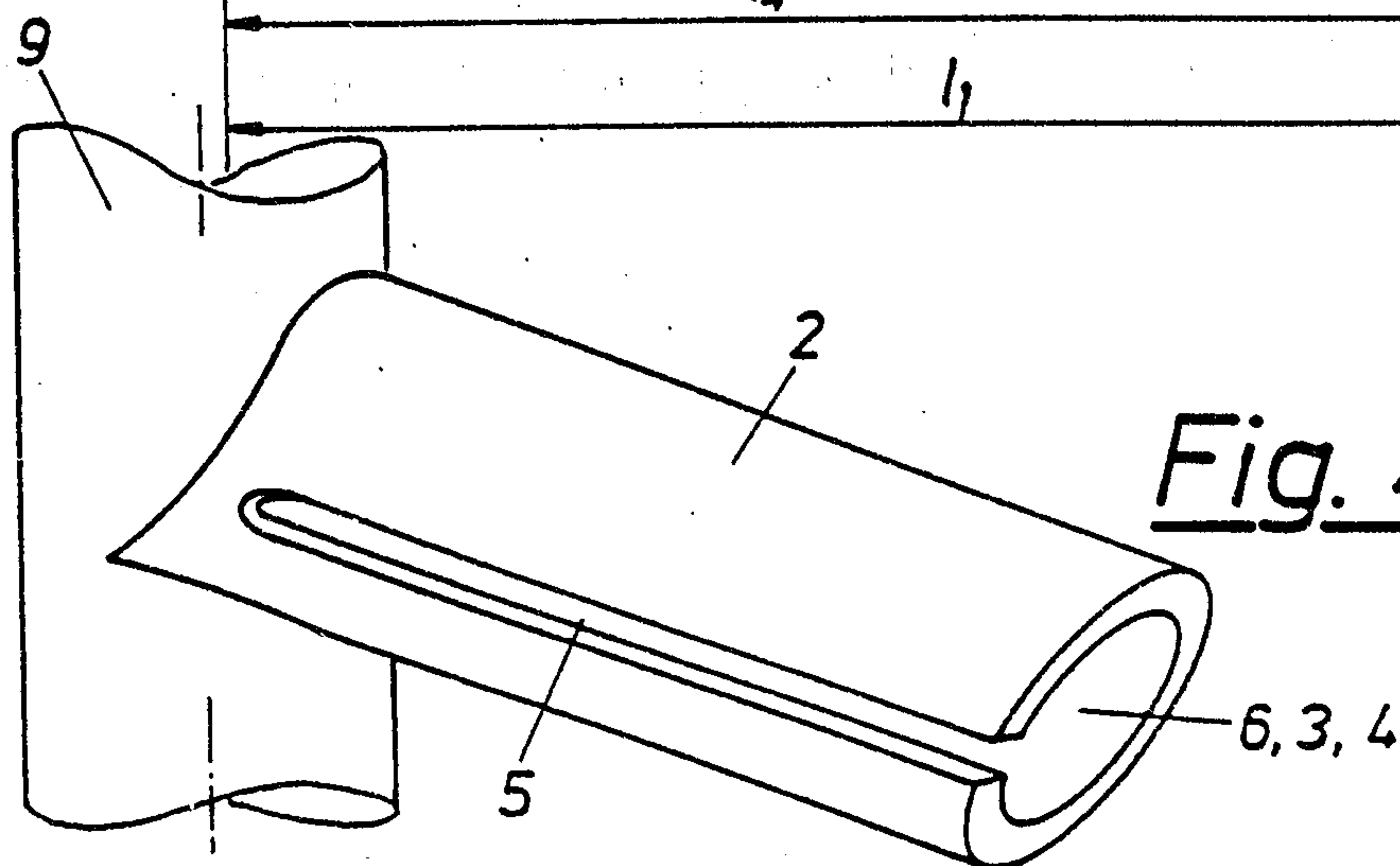


Fig. 5

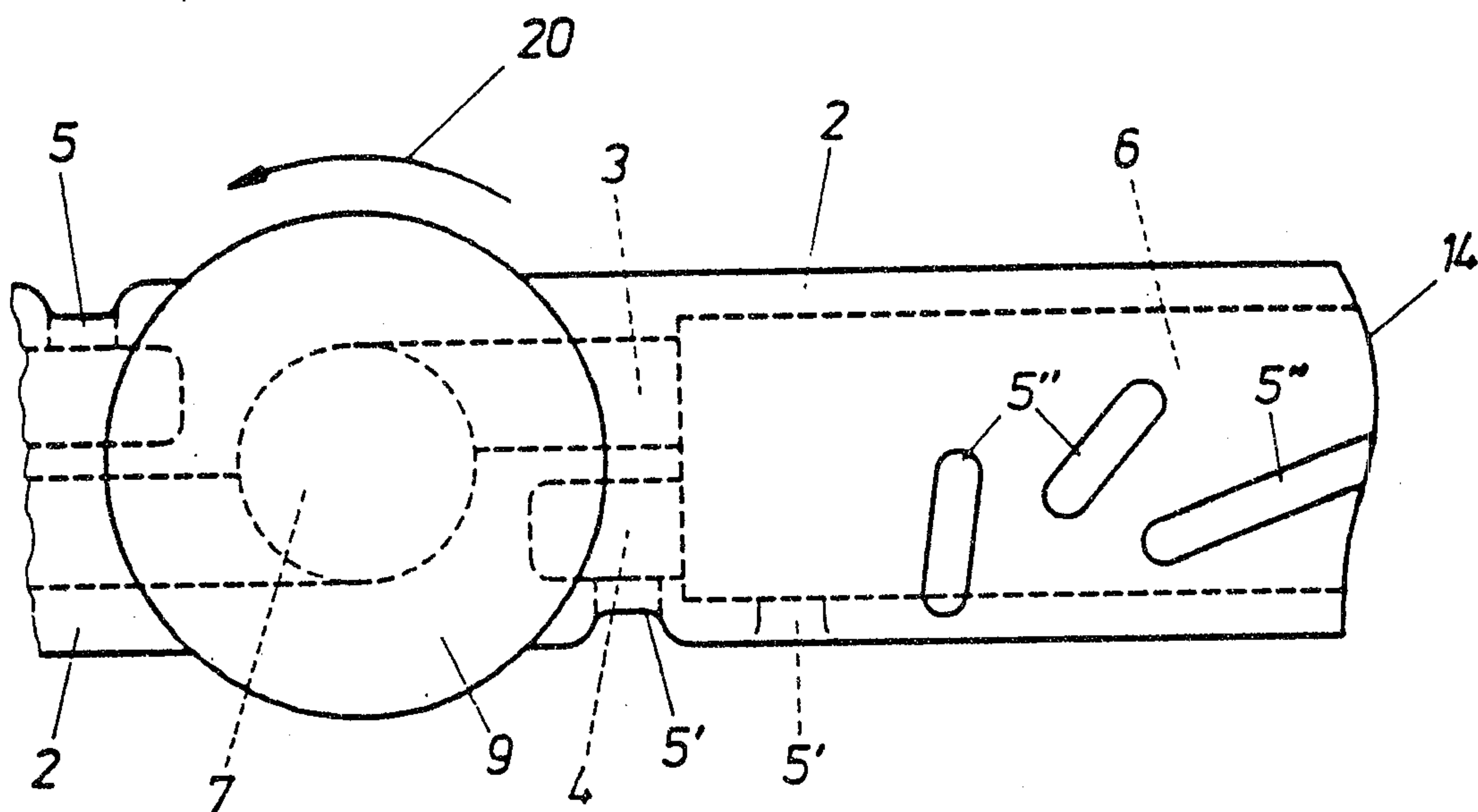


Fig. 6

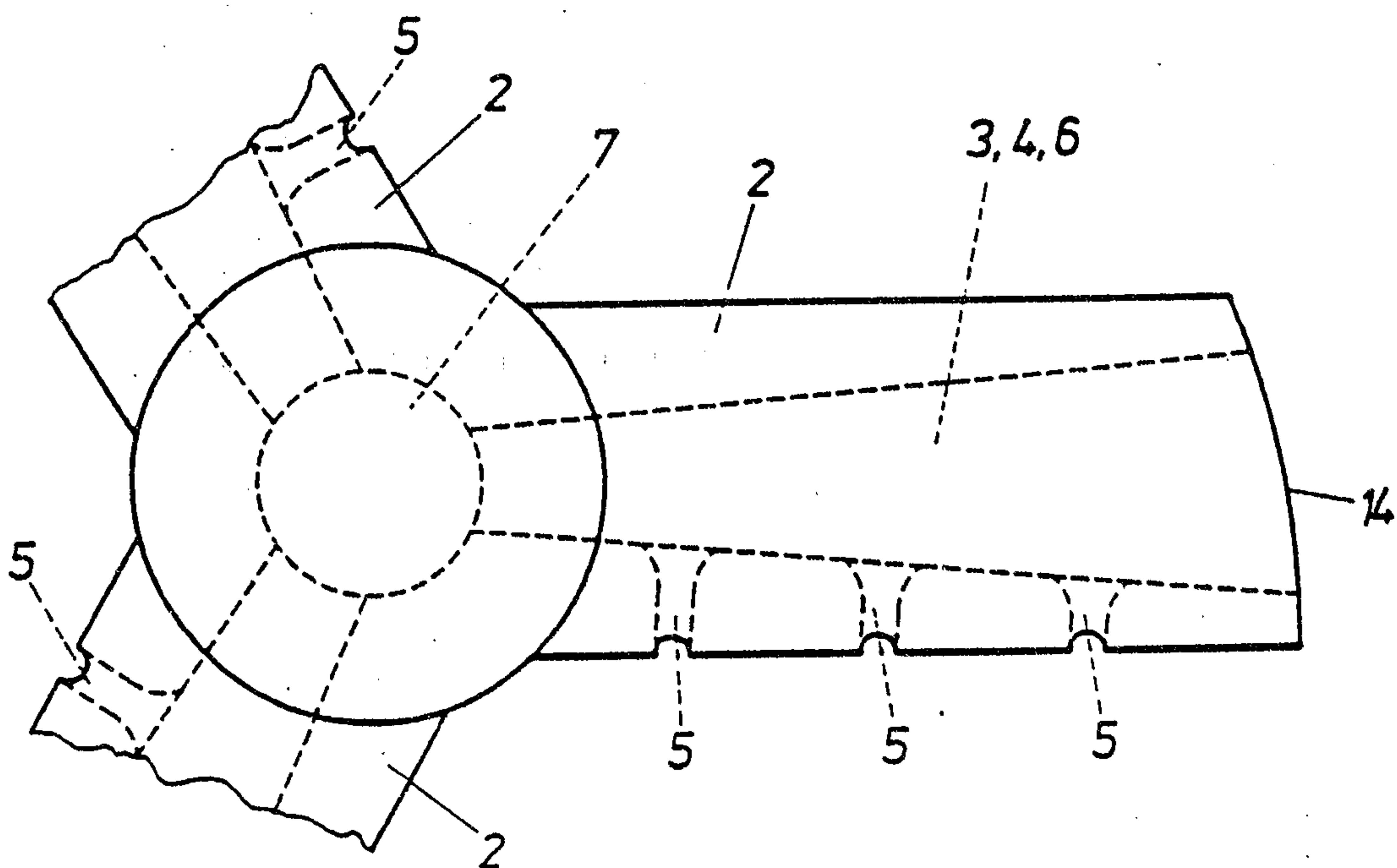


Fig. 7

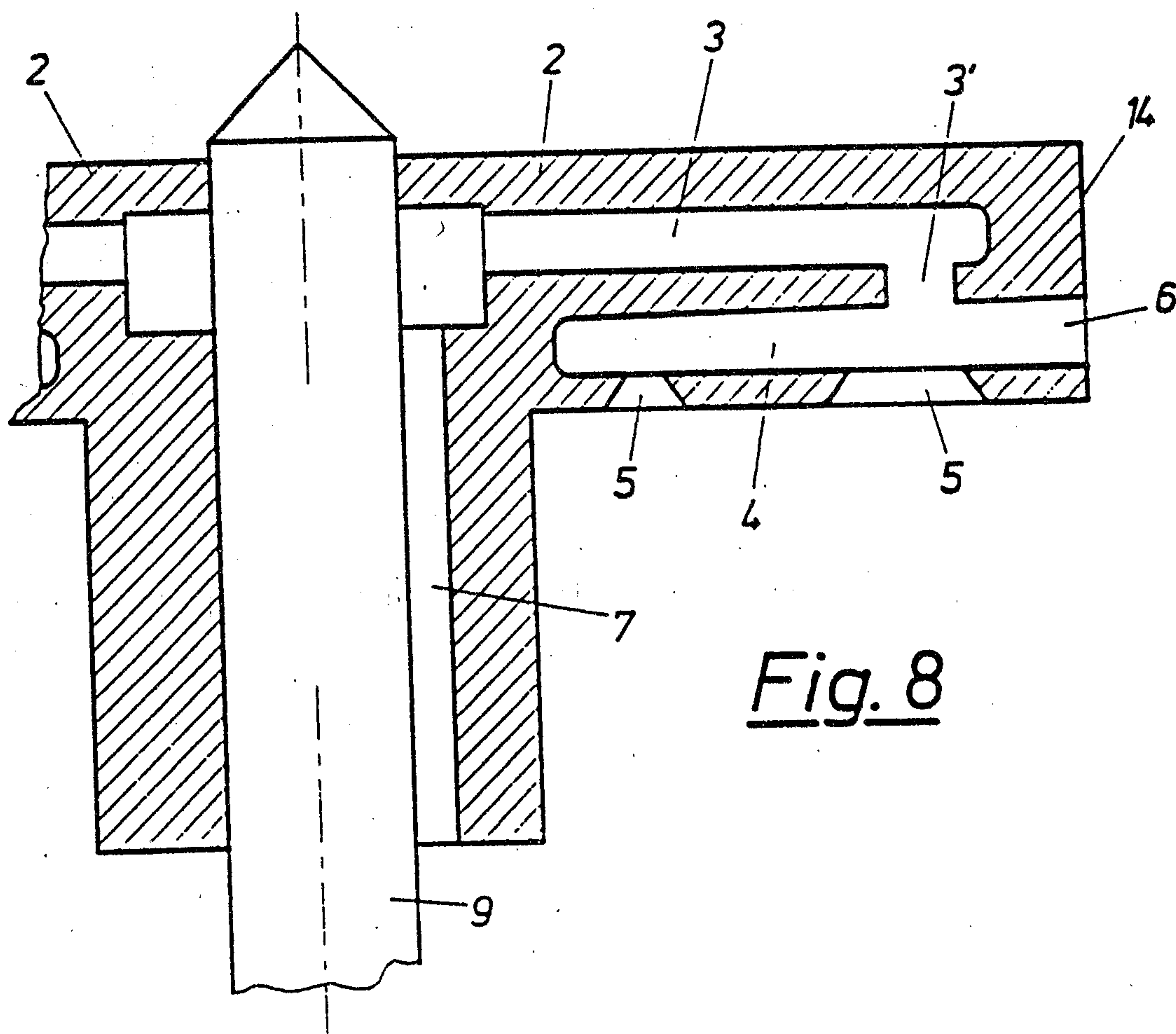
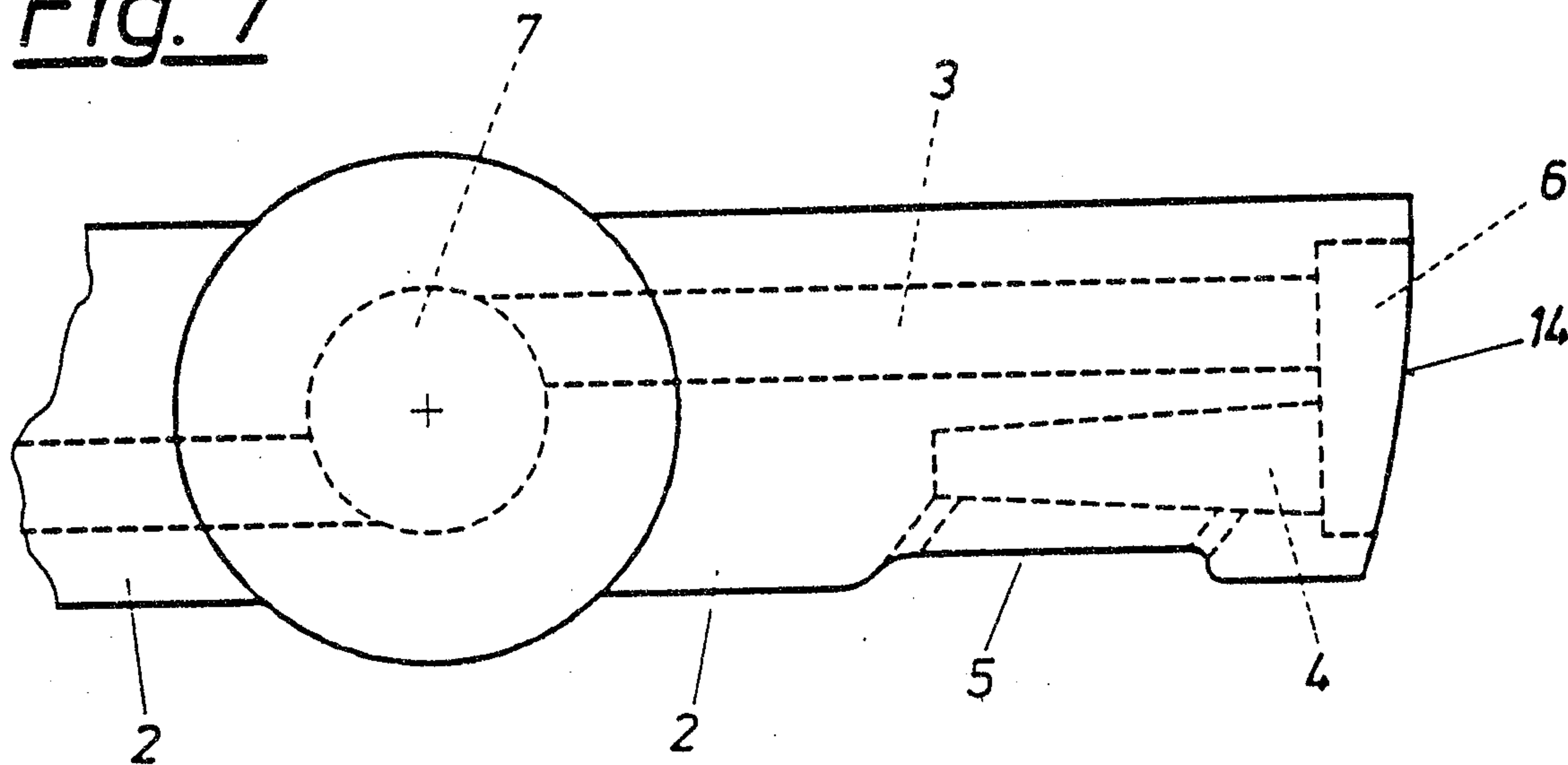


Fig. 8

6/9

Fig. 9

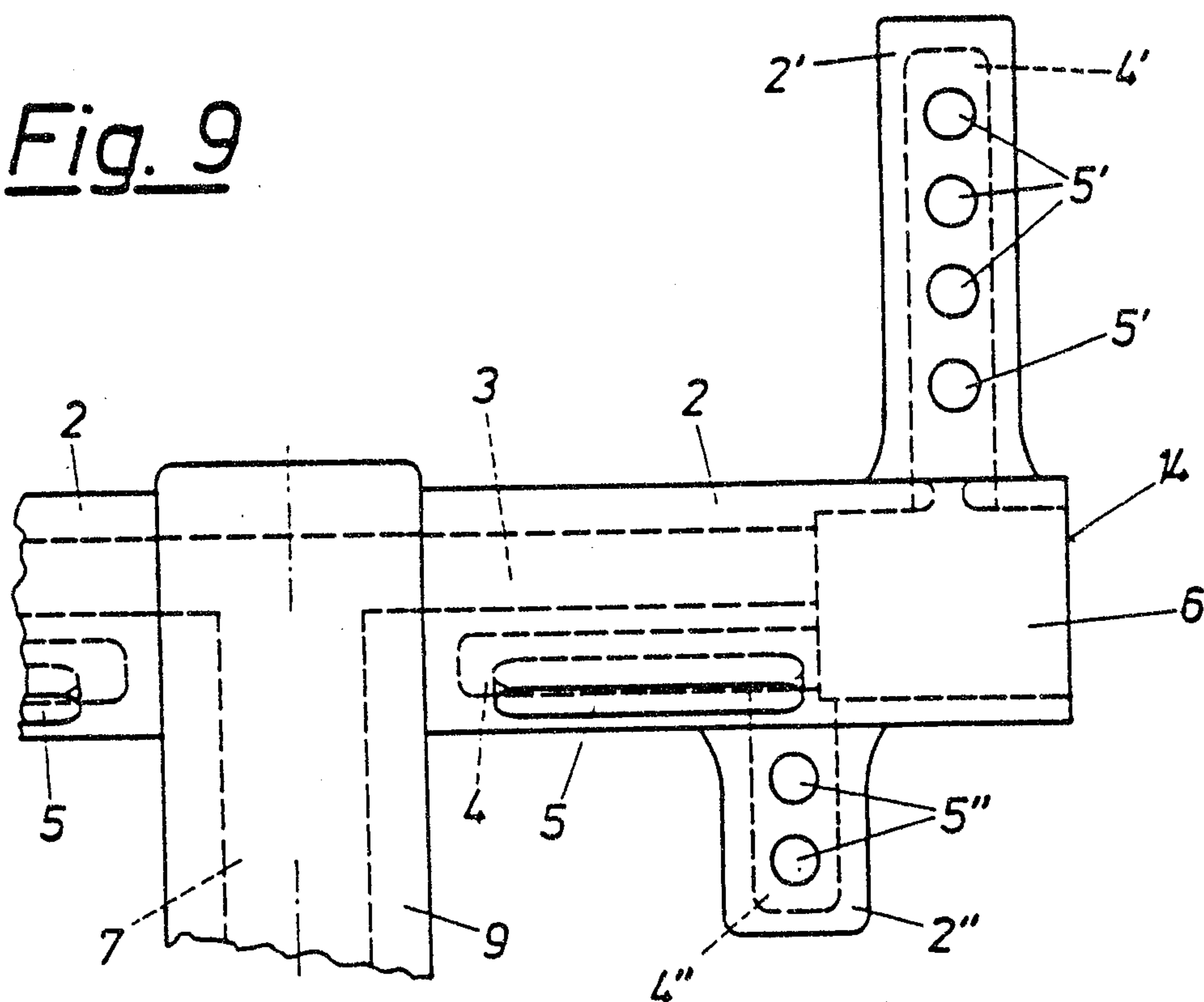


Fig. 10

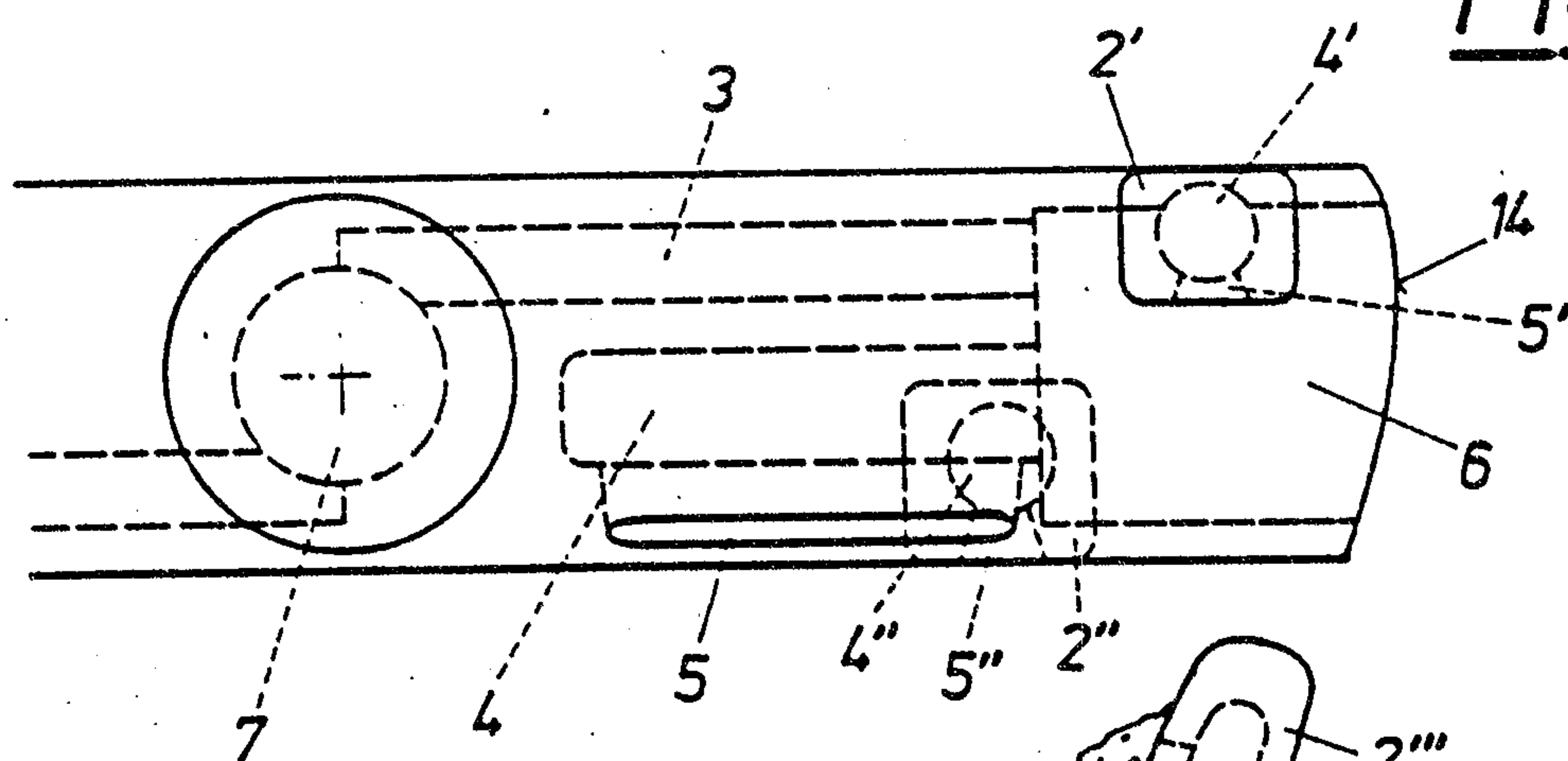
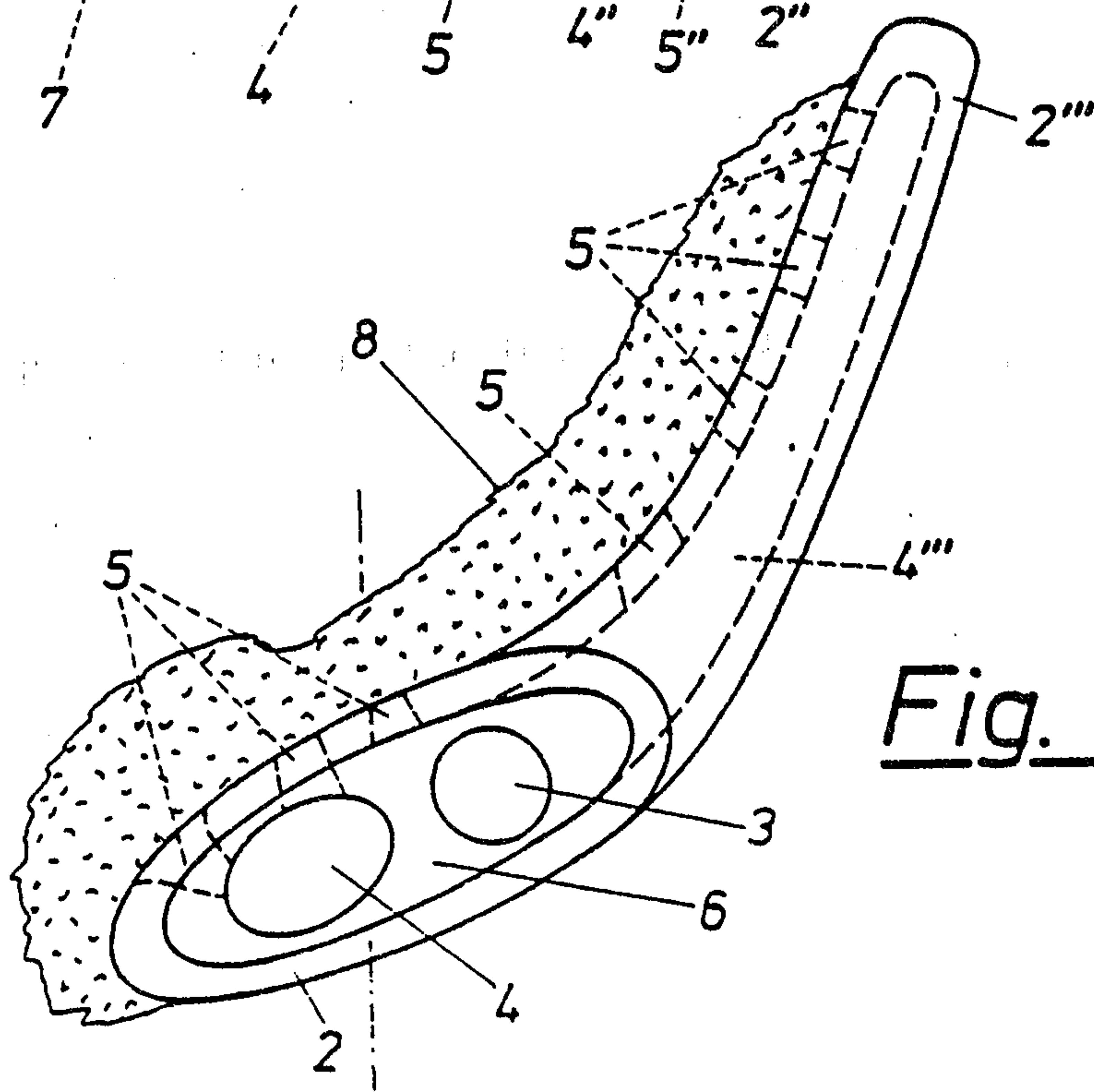
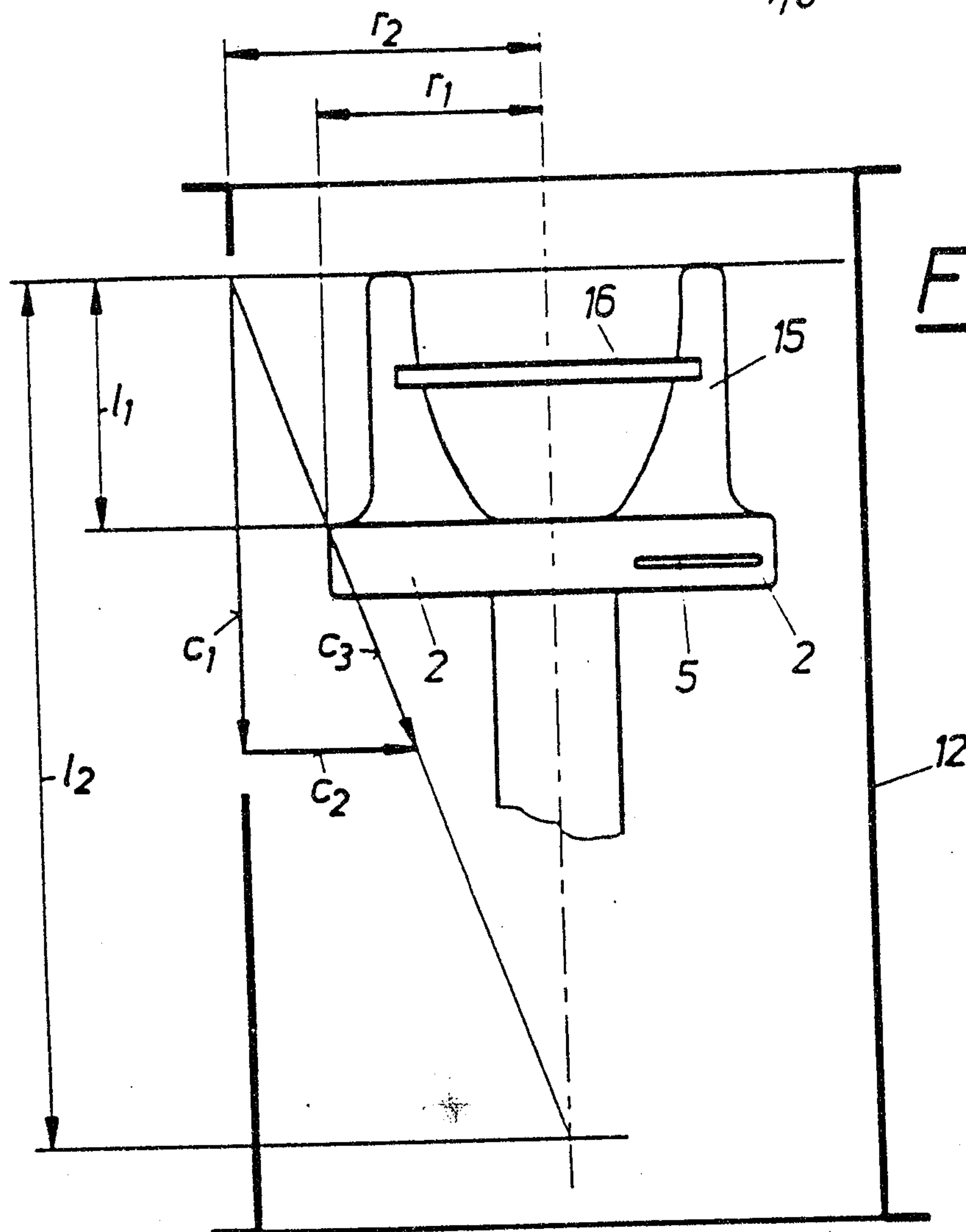
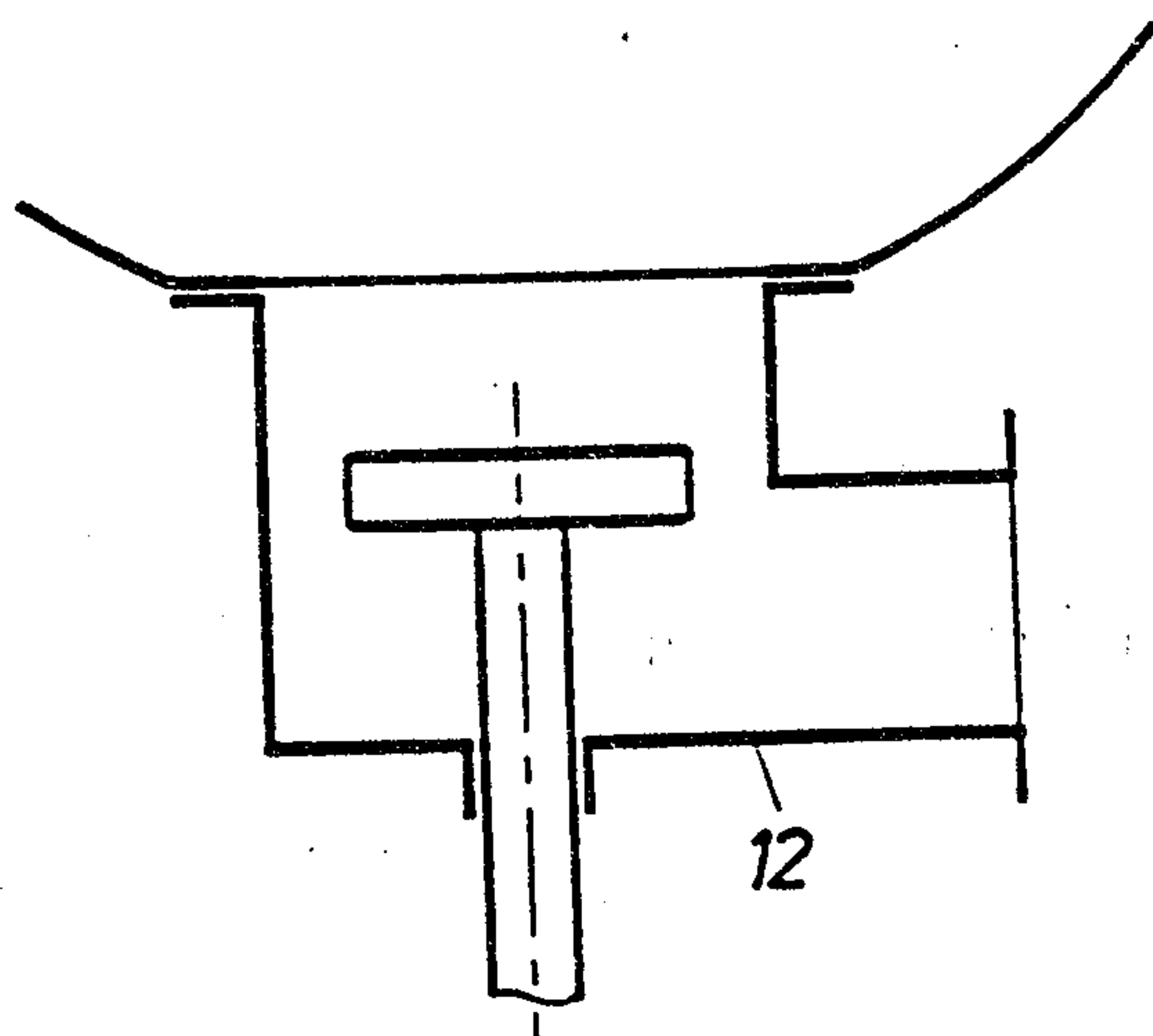
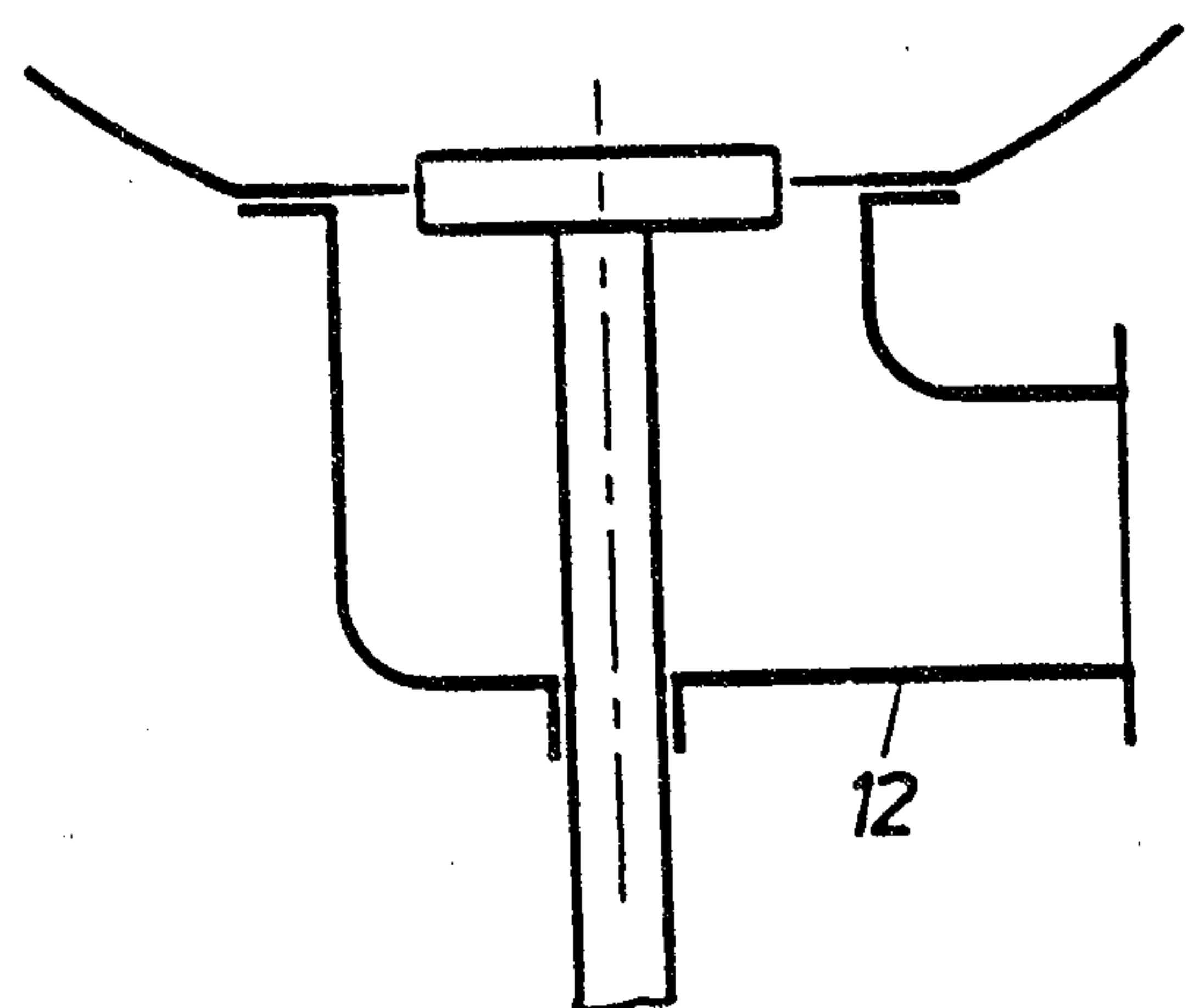
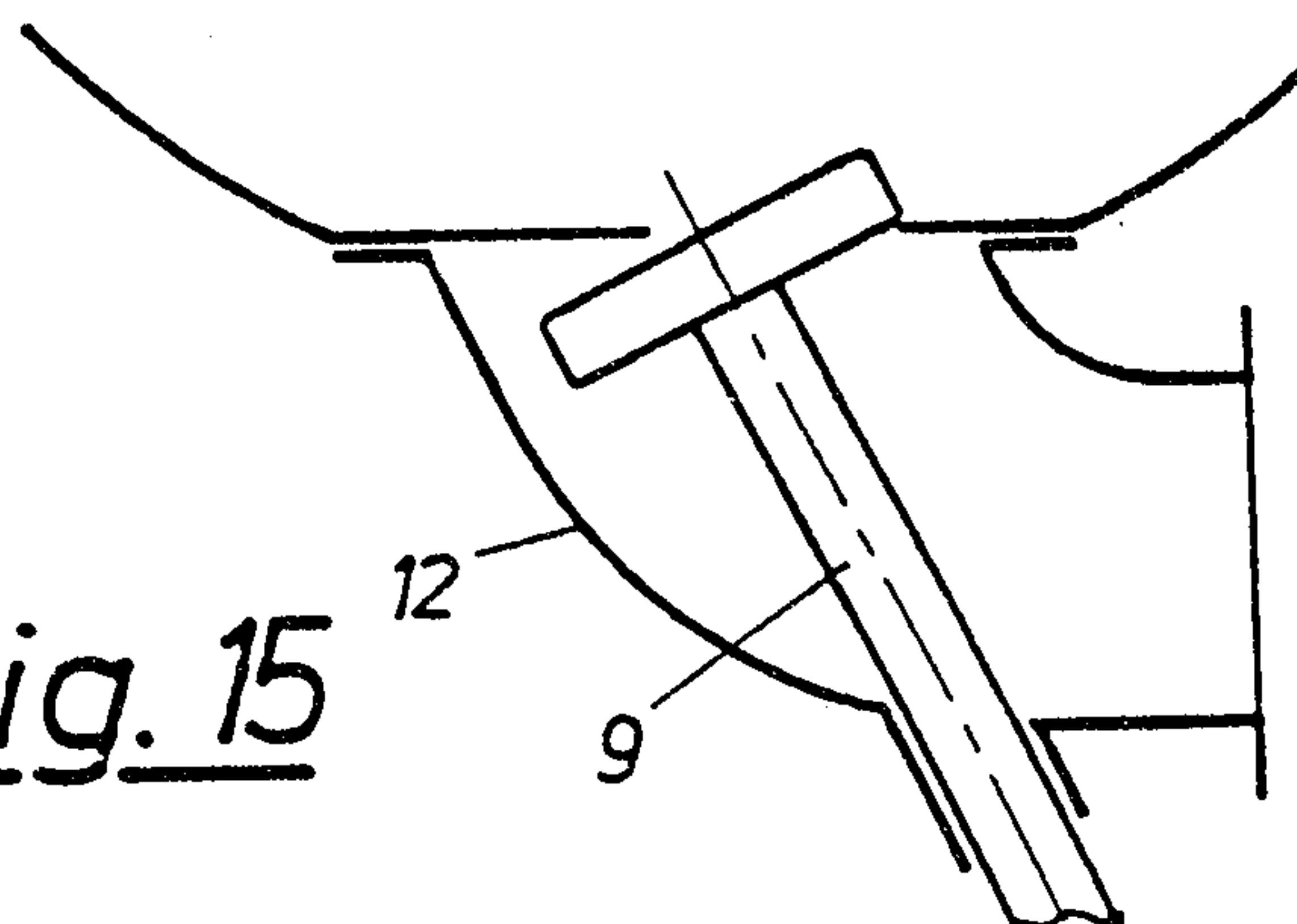


Fig. 11



7/9

Fig. 12Fig. 13Fig. 14Fig. 15

8/9

Fig. 16

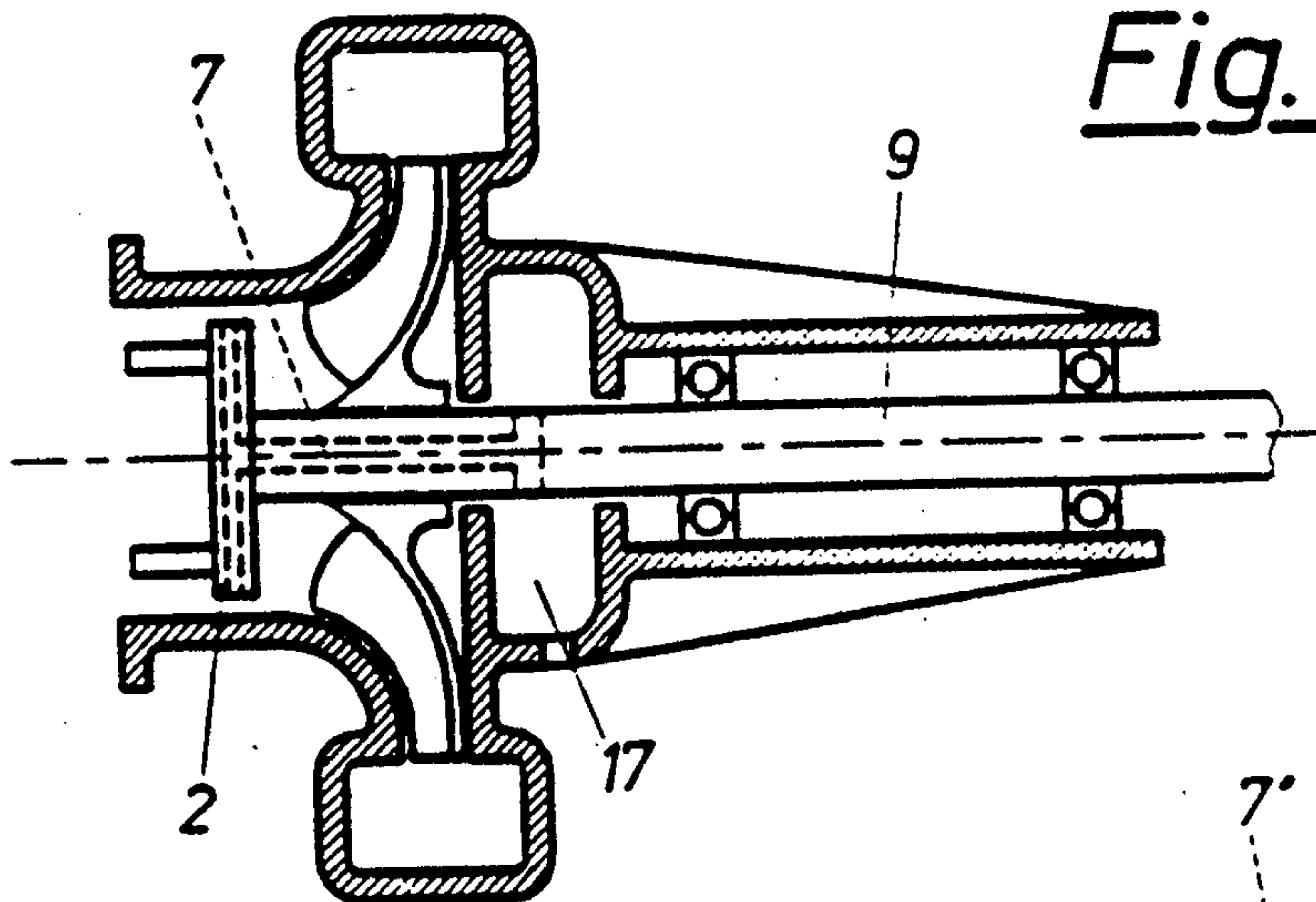


Fig. 17

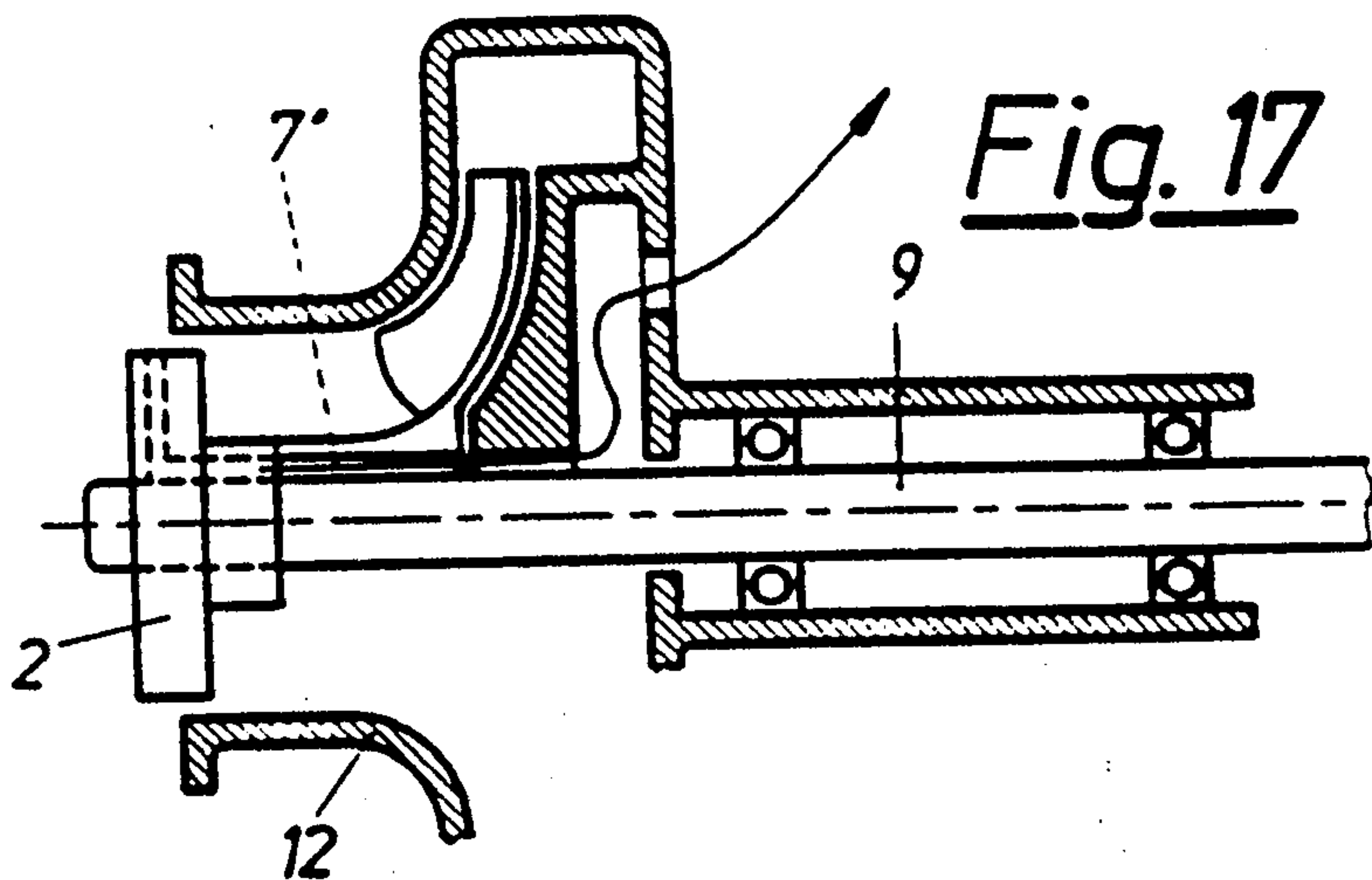


Fig. 18

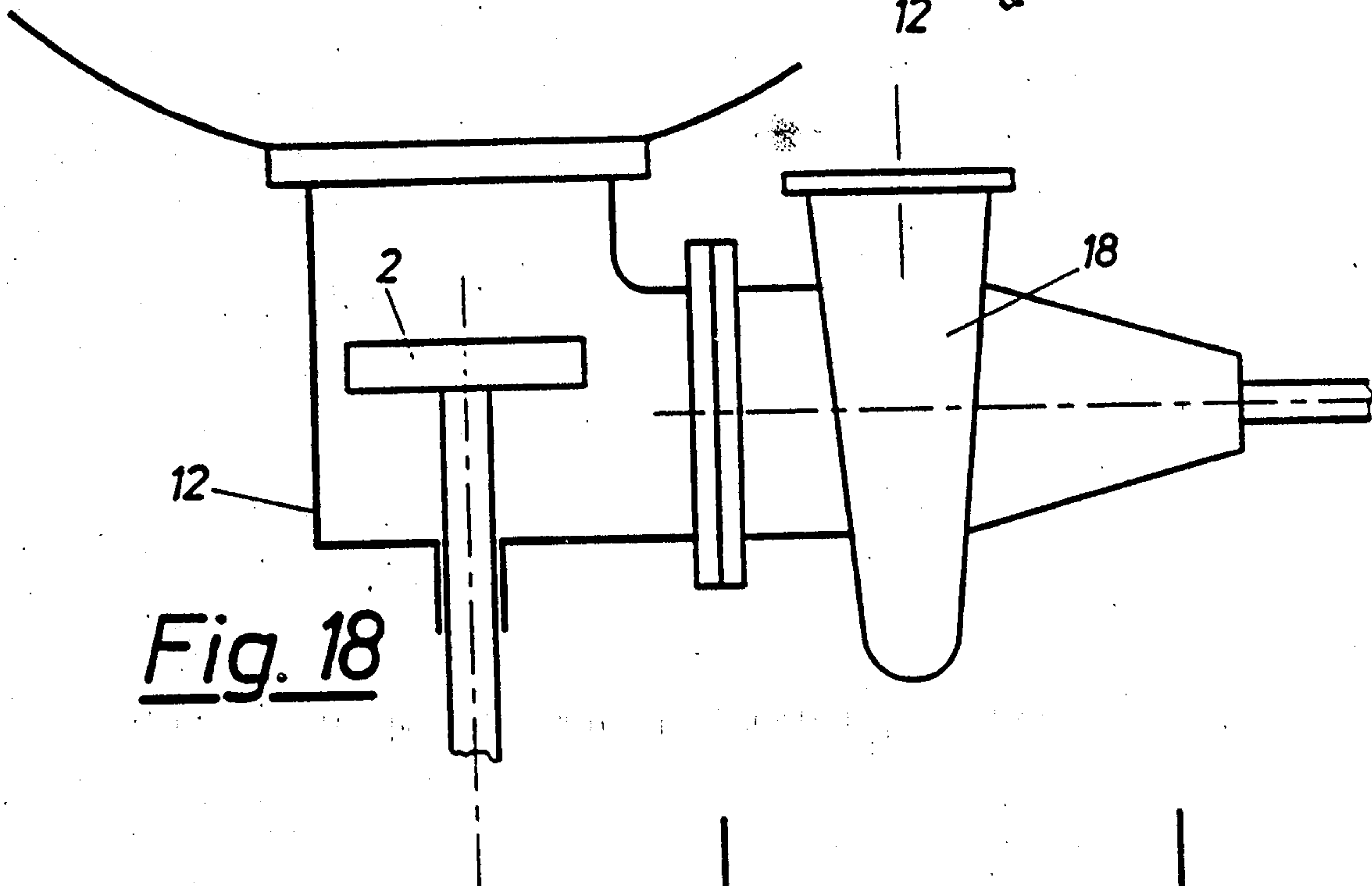
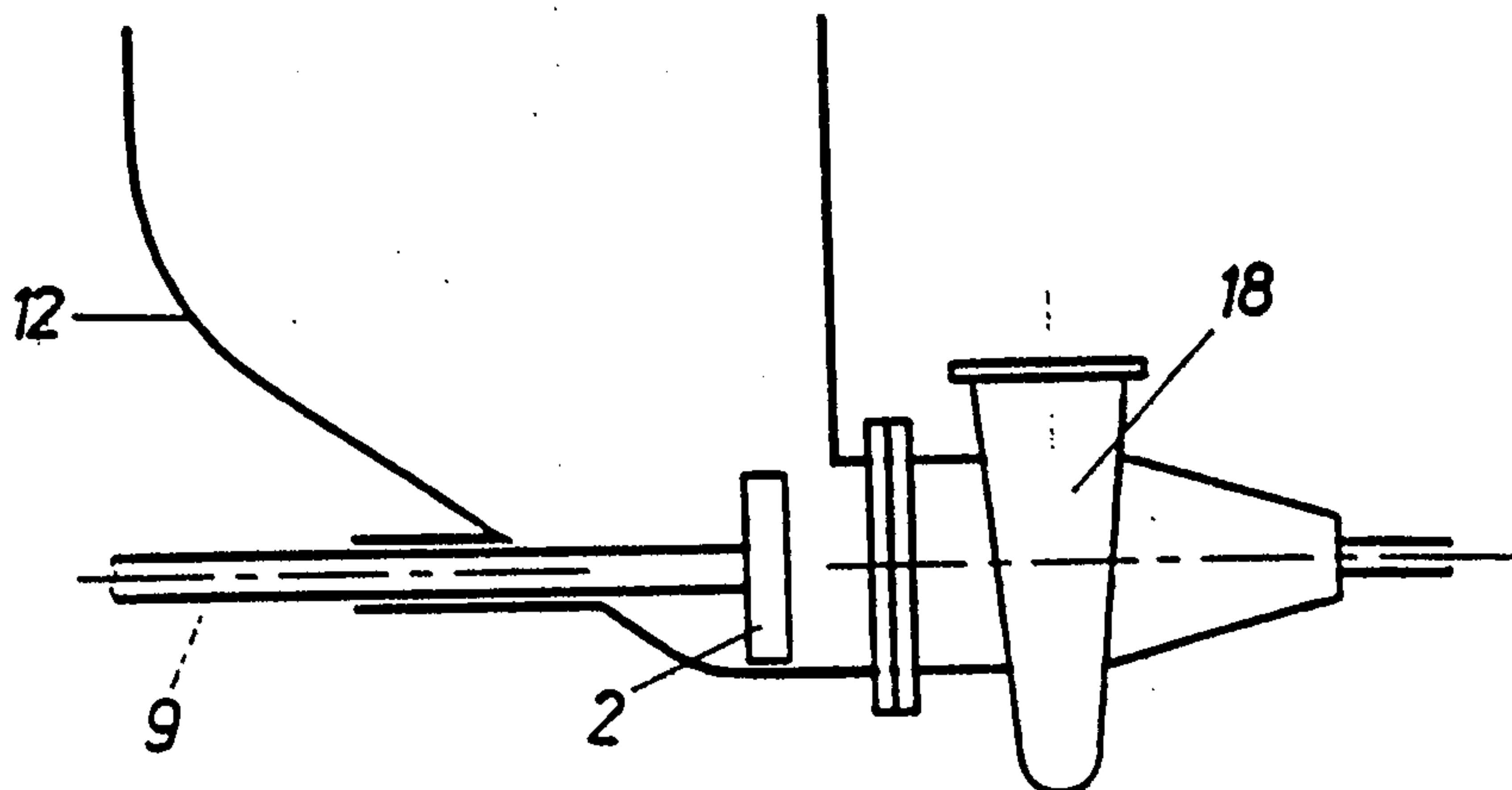


Fig. 19



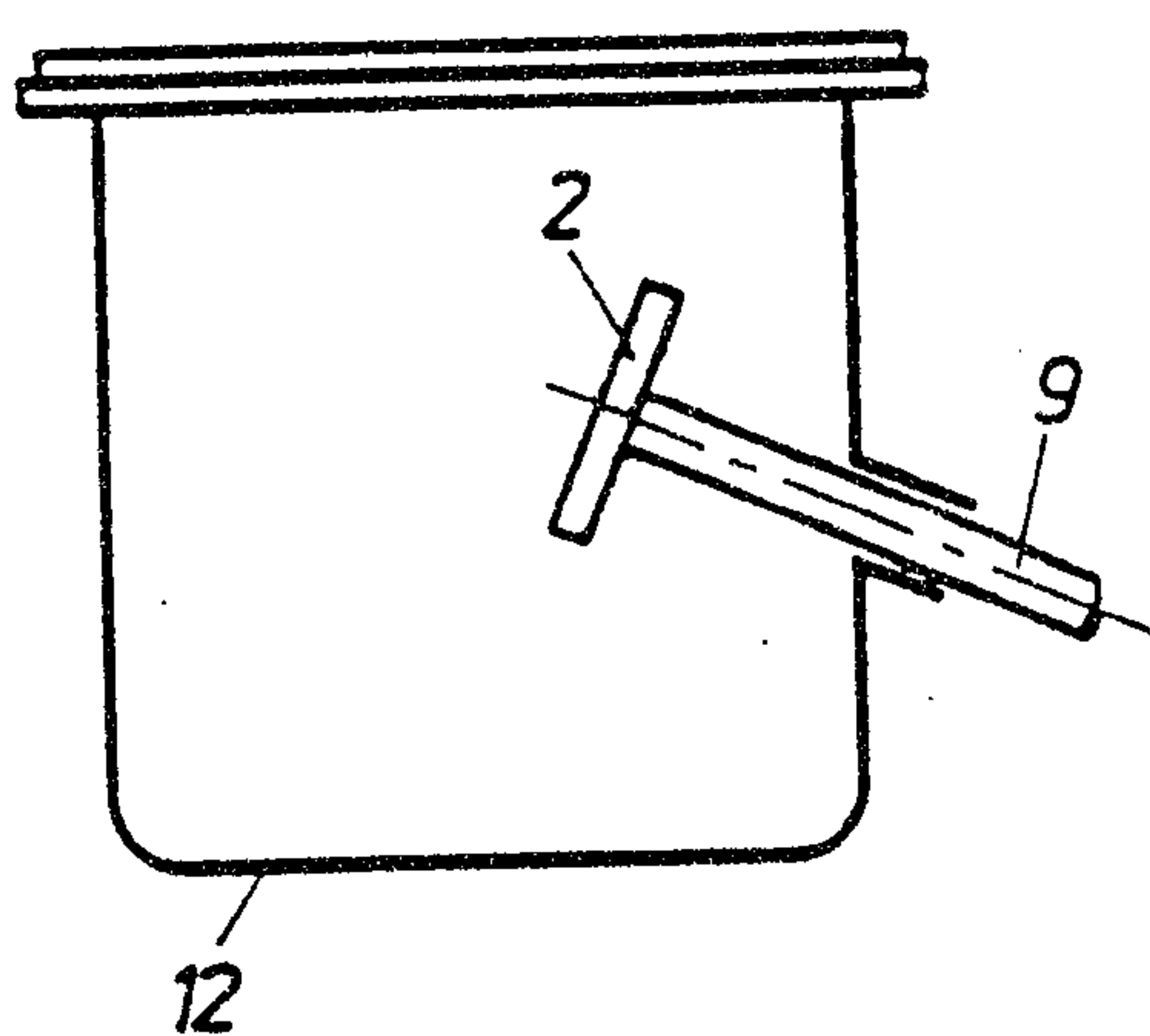


Fig. 20

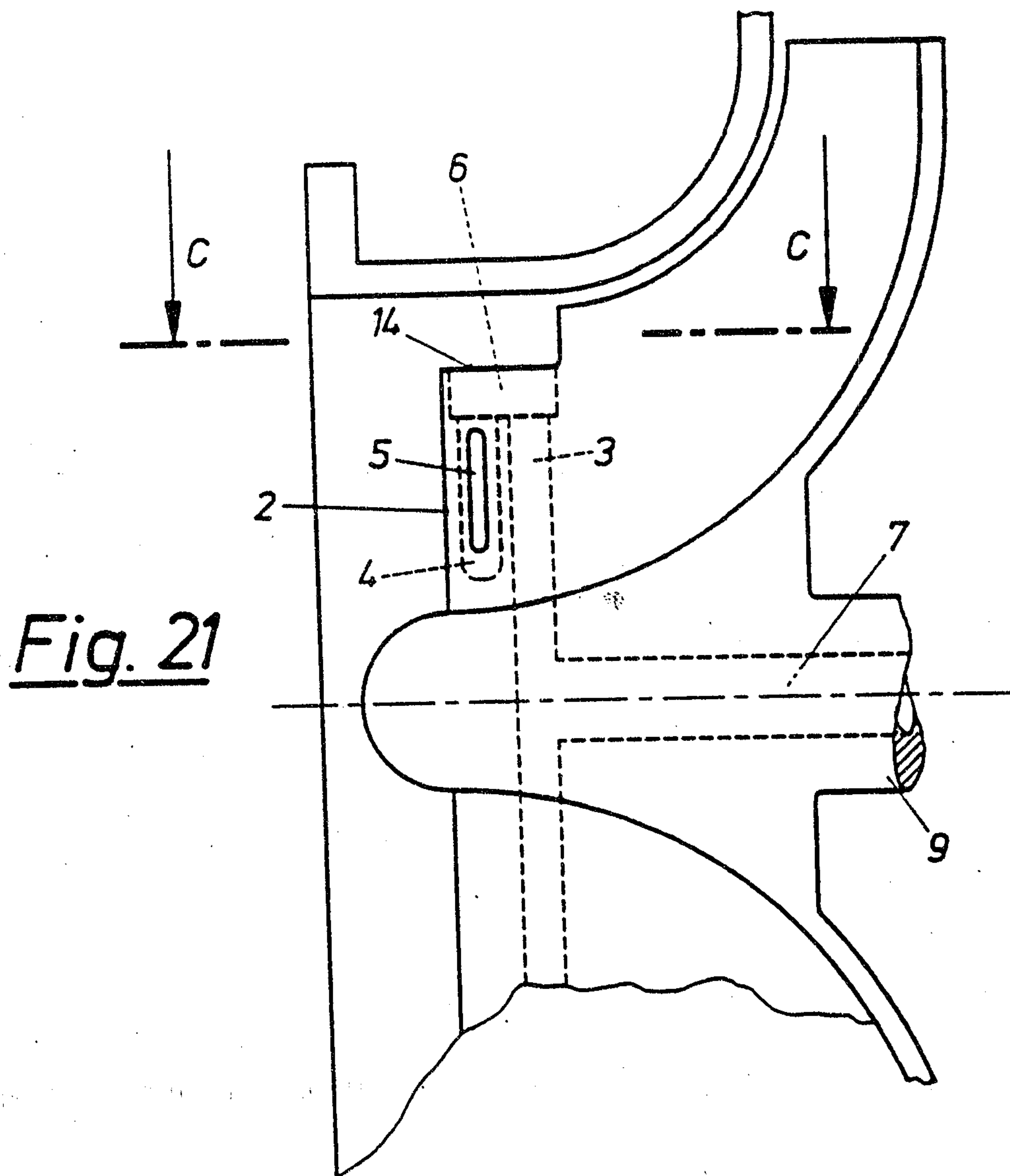


Fig. 21

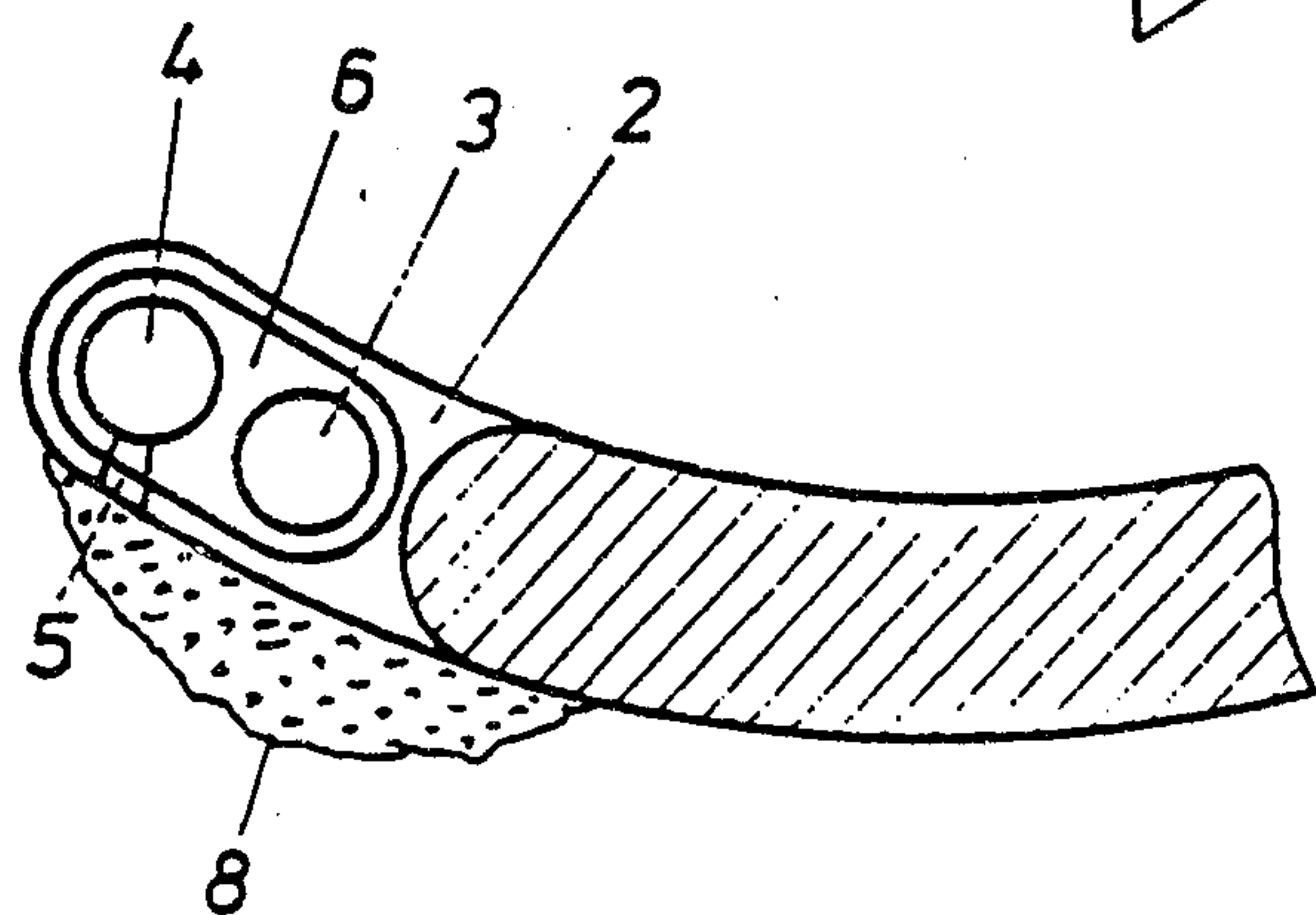


Fig. 22

