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CA 2868599 C 2016/03/01

(11)(21) **2 868 599**

(12) BREVET CANADIEN / CANADIAN PATENT

(13) **C**

(22) **Date de dépôt/Filing Date:** 2014/10/21

(41) **Mise à la disp. pub./Open to Public Insp.:** 2014/12/26

(45) **Date de délivrance/Issue Date:** 2016/03/01

(51) **Cl.Int./Int.Cl.** ***E01H 5/02*** (2006.01)

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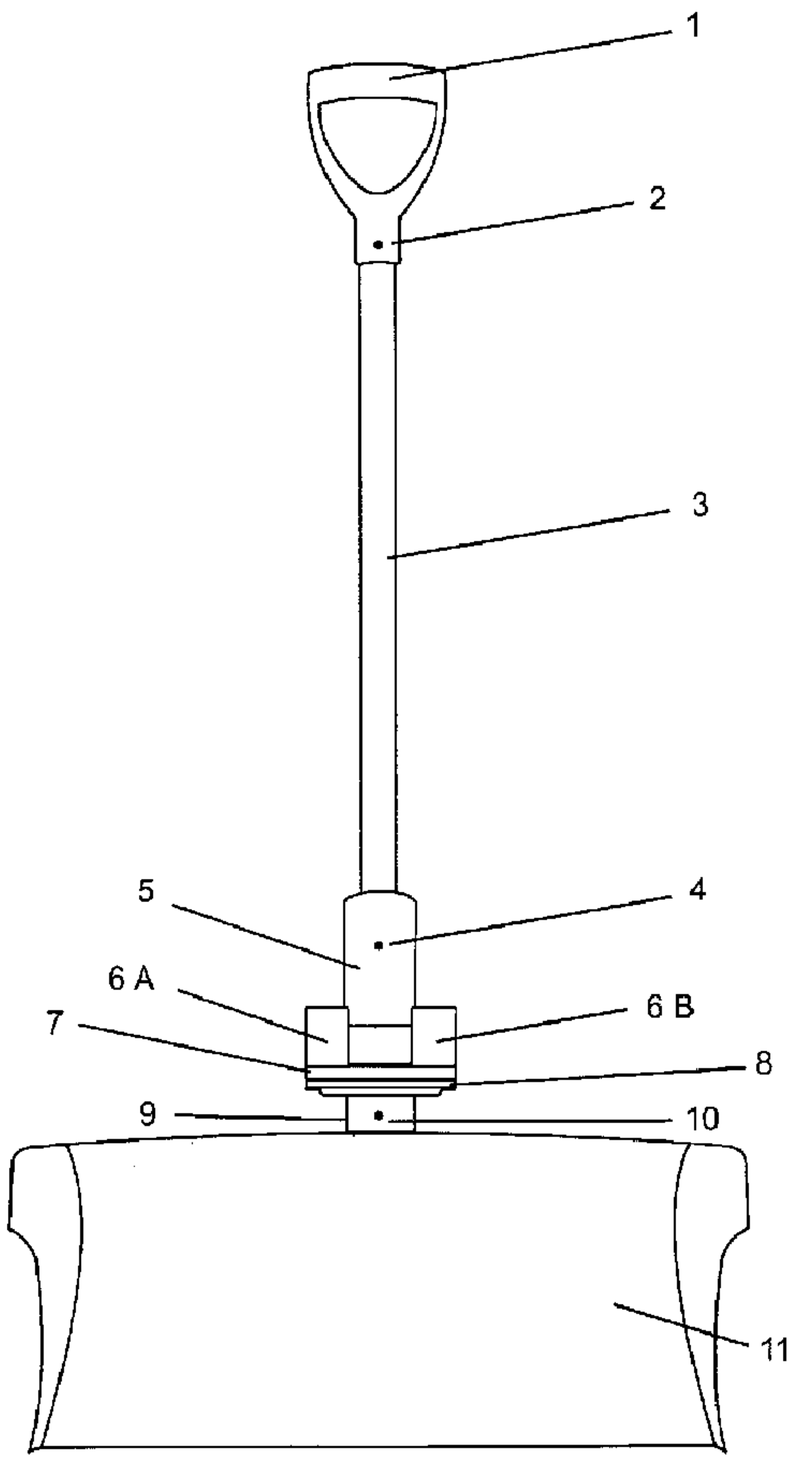
(54) **Titre : UNE COMBINAISON DE PELLE A NEIGE ET GRATTE A 8 REGLAGES**
(54) **Title: A SNOW SHOVEL AND PUSHER COMBINATION WITH 8 ADJUSTABLE SETTINGS**



(57) **Abrégé/Abstract:**
The invention provides a single improved snow shovel and pusher combination with eight adjustable settings that is capable of providing the user an opportunity to adjust it according to their need during the process of snow removal from ground or the

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(57) **Abrégé(suite)/Abstract(continued):**
surface to be cleaned that could be but not limited to driveways, walkways, passages, stairs, docks and decks. To select any one of the 8 settings or adjustments of this invention, the D shaped hand grip needs to be rotated 45 degrees in clock wise direction which will change its setting or locking position. These multiple settings are useful in situations when the snow is also required to be pushed simultaneously towards right or left hand side while pushing forward before lifted and thrown away by using the snow shovel mode /setting.

Abstract of the Disclosure

The invention provides a single improved snow shovel and pusher combination with eight adjustable settings that is capable of providing the user an opportunity to adjust it according to their need during the process of snow removal from ground or the surface to be cleaned that could be but not limited to driveways, walkways, passages, stairs, docks and decks. To select any one of the 8 settings or adjustments of this invention, the D shaped hand grip needs to be rotated 45 degrees in clock wise direction which will change its setting or locking position. These multiple settings are useful in situations when the snow is also required to be pushed simultaneously towards right or left hand side while pushing forward before lifted and thrown away by using the snow shovel mode /setting.

Title of Invention

A SNOW SHOVEL AND PUSHER COMBINATION WITH 8 ADJUSTABLE SETTINGS

Background of Invention

Snow shovels, pushers and some combinations have been known for a very long time, some of the following have patents in Canada and United States:

CA 2621194 A1	Gerald Westgarde
US 20080185857 A1	Wesley Westgarde, Gerald Westgarde
US 8444192	John Pavlic
US 20130233582	Oresti Frati S.R.L.
US 2728598 A	Kalman Szllage
US 6053548 A	Louis G. Bowles

This improved design provides 8 selectable steps / options to the user to change the angle of the blade body relative to the ground or surface to be cleaned by just giving a twist of the D shaped hand grip.

Summary of the Invention

Considered broadly, snow is removed by pushing it using a snow pusher which accumulates it and then lifted and thrown in a designated area by using snow shovel. The main difference between the two is the angle of the blade body relative to the ground or surface to be cleaned. In a snow shovel, the blade body is nearly horizontal to the ground or surface to be cleaned and in a snow pusher, the blade body is nearly vertical to the surface to be cleaned. If the snow is also required to be pushed

towards right or left hand side simultaneously while being pushed forward which helps shifting more volume in the next pushing operation which collects the previously shifted snow along with a fresh layer of snow, then the process requires the blade body to have the ability to also rotate at another axis either to the right or left along with horizontal and vertical angles as required in a shovel and pusher. This angle shifts the pushed snow towards right or left, this shifting of snow is directly proportional to this angle, less shifting with smaller angle and more shifting with greater angle.

The design of snow shovel and pusher combination with 8 adjustable settings includes a blade body and an elongated handle. Closer to the blade body between the two ends of the long handle is a 360 degree rotating joint which is comprised of two flanges joined together with the help of a steel bolt, nut and two washers while having the ability to rotate with one flange face sliding in a circular motion on the other. This rotating joint comprises of two main parts namely a stationary flange and a rotating flange. The stationary flange has a circular sliding face with 8 concave recesses evenly divided on the sliding face at equal distance from centre. There is also male component attached to the other side of the flange to be inserted in to the blade body attaching receptacle which is part of the blade body. The rotating flange also has a circular sliding face equal to size as in stationary flange. This flange has two tubular housings. Each one to accommodate one spring and one steel ball that are required to achieve the 8 locking positions. There is also a female receptacle attached to the other side of the rotating flange at an angle as a part to be attached to the other end of the. The other end of the long handle has a D shaped hand grip attached to it which is normally found in long handle tools. During use, the blade body in snow pusher setting/mode should be nearly vertical to the surface to be cleaned and in snow shovel setting/mode blade body should be nearly horizontal to the surface to be cleaned. The rotating joint assembly has 8 adjustable setting positions that are lockable.

The invention with 8 setting options is very useful in operating the device most efficiently based on the need. A rotating movement of 180 degrees of the D shaped hand grip when it is parallel to the ground produces change in blade body position from snow pusher to snow shovel or visa a versa. In between these two settings are 6 other

option available to user for simultaneously side shifting of snow towards left or right while pushing.

Brief Description of Drawings

These and other features will become more apparent from the following description in which reference is made to the appended drawings, the drawings are for the purpose of illustration only and are not intended to be in any way limiting, wherein:

FIG. 1 is a front elevation view of a snow shovel and pusher combination. The setting or position could also be called as “mode”

FIG. 2 is a side elevation view of the snow shovel and pusher combination, set in pusher setting/mode

FIG. 3 is a side elevation view of the snow shovel and pusher combination, set in snow shovel setting/mode

FIG. 4 is a top elevation view of the snow shovel and pusher combination tilted 22.5 degrees towards left in snow shovel setting/mode

FIG. 5 is a top elevation view of the snow shovel and pusher combination tilted 22.5 degrees towards right in snow shovel setting/mode

FIG. 6 is a top elevation view of the snow shovel and pusher combination tilted 22.5 degrees towards left in snow pusher setting/mode

FIG. 7 is a top elevation view of the snow shovel and pusher combination tilted 22.5 degrees towards right in snow pusher setting/mode

FIG. 8 is a top elevation view of the snow shovel and pusher combination tilted 45 degrees towards left in snow shovel setting/mode

FIG. 9 is a top elevation view of the snow shovel and pusher combination tilted 45 degrees towards right in snow shovel setting/mode

FIG. 10 is a top elevation view of the snow shovel and pusher combination tilted 45 degrees towards left in snow pusher setting/mode

FIG. 11 is a top elevation view of the snow shovel and pusher combination tilted 45 degrees towards right in snow pusher setting/mode

FIG. 12A is the side view of the 360 degree rotating flange attached with the stationary flange of the rotating joint assembly

FIG. 12B is the steel bolt, nut and two washers for attaching the rotating flange with stationary flange of the rotating joint assembly

FIG. 13 is the rotating flange part of the rotating joint assembly

FIG. 14 is the stationary flange part of the rotating joint assembly

FIG. 15 is the cross section of the rotating flange part of the rotating joint assembly showing details in “X” axis

FIG. 16 is the cross section of the rotating flange part of the rotating joint assembly showing details in “Y” axis

FIG. 17 is the cross section of the stationary flange part of the rotating joint showing details in “Y” axis

FIG. 18, 19, 20 and **21** are the side elevations of the rotating and stationary flanges of the rotating joint assembled together and rotated 90 degrees in each step

FIG. 22 is the side elevation of the blade body attached to rotating joint assembly showing Face line or “Blade Offset Angle” and “Handle Offset Angle”

FIG. 23, 24, 25, 26, 27, 28, 29 and 30 are top view of the 360 degrees rotating flange of the rotating joint shown in 8 steps each of 45 degrees, rotated clockwise

DETAILED DESCRIPTION

The snow shovel and pusher combination with 8 adjustable settings will be described in details with reference to numbered parts

FIG. 1, 1 is the D shaped hand grip, 2 is the screw securing D shaped hand grip the long handle. 3 is the long handle. 4 is the screw securing the rotating flange to the long handle. Following are parts of the rotating joint 5. Is the female receptacle to hold the other end of the long handle. 6A and 6B are the housings accommodating the two springs and steel balls for position locking. 7 is the rotating flange face. 8 is the stationary flange face, both faces touch each other and slide with lubrication in between, a nut, bolt and 2 washers (not visible) do the linking job. 9 is the stationary flange. 10 is the screw securing the stationary flange to the blade body and 11 is the blade body

FIG. 2 is the side view showing the snow shovel and pusher combination with 8 adjustable settings in pusher setting/mode. 1 is the D shaped hand grip. 2 is the screw securing D shaped hand grip to the long handle. 3 is the long handle and 11 is the blade body. The circled components are the 360 rotating joint assembly the rotating joint whose part details is shown in **FIG. 12A**

FIG. 3 is the side view showing the snow shovel and pusher combination with 8 adjustable settings in shovel setting/mode. 1 is the D shaped hand grip. 2 is the screw securing D shaped hand grip to the long handle. 3 is the long handle and 11 is the blade body. The circled components are the 360 degree rotating joint assembly the rotating joint whose part details is shown in **FIG. 12A**

FIG. 4 is a top elevation view of the snow shovel and pusher combination with 8 adjustable settings of FIG. 1 tilted 22.5 degrees towards left in Shovel Mode. 1 is the D shaped hand grip, 2 is the screw securing D shaped hand grip to the long handle. 3 is the long handle and 11 is the blade body. The circled components are the 360 degree rotating joint assembly the rotating joint whose part details are shown in **FIG. 12A**

FIG. 5 is a top elevation view of the snow shovel and pusher combination with 8 p adjustable settings of FIG. 1 tilted 22.5 degrees towards right in shovel mode. 1 is the D shaped hand grip, 2 is the screw securing D shaped hand grip to the long handle. 3 is the long handle and 11 is the blade body. The circled components are the 360 degree rotating joint assembly the rotating joint whose part details is shown in **FIG. 12A**

FIG. 6 is a top elevation view of the snow shovel and pusher combination with 8 adjustable settings of FIG. 1 tilted 22.5 degrees towards left in pusher mode. 1 is the D shaped hand grip, 2 is the screw securing D shaped hand grip to the long handle. 3 is the long handle and 11 is the blade body. The circled components are the 360 degree rotating joint assembly the rotating joint whose parts detail is shown in **FIG. 12A**

FIG. 7 is a top elevation view of the snow shovel and pusher combination with 8 adjustable settings of FIG. 1 tilted 22.5 degrees towards right in pusher mode. 1 is the D shaped hand grip, 2 is the screw securing D shaped hand grip to the long handle. 3 is the long handle and 11 is the blade body. The circled components are the 360 rotating joint assembly the rotating joint whose parts detail is shown in **FIG. 12A**

FIG. 8 is a top elevation view of the snow shovel and pusher combination with 8 adjustable settings of FIG. 1 tilted 45 degrees towards left in Shovel Mode. 1 is the D shaped hand grip, 2 is the screw securing D shaped hand grip to the long handle. 3 is the long handle and 11 is the blade body. The circled components are the 360 degree rotating joint assembly the rotating joint whose parts detail is shown in **FIG. 12A**

FIG. 9 is a top elevation view of the snow shovel and pusher combination with 8 p adjustable settings of FIG. 1 tilted 45 degrees towards right in Shovel Mode. 1 is D shaped hand grip, 2 is the screw securing D shaped hand grip to the long handle. 3 is the long handle and 11 is the blade body. The circled components are the 360 degree rotating joint assembly the rotating joint whose parts detail is shown in **FIG. 12A**

FIG. 10 is a top elevation view of the snow shovel and pusher combination with 8 adjustable settings of FIG. 1 tilted 45 degrees towards left in pusher mode. 1 is the D shaped hand grip. 2 is the screw securing D shaped hand grip to the long handle. 3 is the long handle and 11 is the blade body. The circled components are the 360

degree rotating joint assembly the rotating joint whose parts detail is shown in **FIG. 12A**

FIG. 11 is a top elevation view of the snow shovel and pusher combination with 8 adjustable settings of FIG. 1 tilted 45 degrees towards right in Pusher Mode. 1 is the D shaped hand grip. 2 is the screw securing D shaped hand grip to the long handle. 3 is the long handle and 11 is the blade body. The circled components are the 360 rotating joint assembly the rotating joint whose parts detail is shown in **FIG. 12A**

FIG. 12A is the side view of the rotating joint the rotating flange attached with the stationary flange. 4 is the screw for securing long handle to the stationary flange. 5 is the rotating flange. 6A and 6B are the housings to accommodate the two springs and steel balls (not visible) for locking. 7 is the flange face of the rotating joint. 8 is the face of the stationary flange. 9 is the stationary flange body. 10 is the screw for securing stationary flange with shovel blade body.

FIG. 12B 12 is the steel bolt. 13 is the vibration proof steel nut with nylon insert. 14A and 14B are the two plain steel washers. These four components are used to join together the two flanges namely the rotating flange and the stationary flange in such a manner that they can rotate while sliding over each other's circular face after lubrication but do not have any play or looseness.

FIG. 13 5 is the 360 degree rotating flange body which is part of the rotating joint. 4 is the screw to secure the rotating flange with the long handle. 6A and 6B are the housing for springs and balls for position locking. 7 is the flange face. 15A is the hole to install steel bolt 12 and washer 14A. 16A and 16B are the two spring loaded steel balls. 16C and 16D are the springs for steel balls shown with steel balls which are hidden inside the housings 6A and 6B

FIG. 14 9 is the stationary flange body which is part of the rotating joint. 8 is the stationary flange face. 10 is the screw for securing stationary flange to the shovel blade body. 15B is the hole to install the steel nut 13 and washer 14B. 17, 18, 19, 20, 21, 22, 23 and 24 are the 8 concave recesses at 45 degrees to each other with reference to the centre of the flange to accommodate the 2 spring loaded steel balls 16A and 16B from the 360 degrees rotating flange for locking purposes.

FIG. 15 These are the cross sections of 360 rotating flange part of the rotating joint on **"X"** axis. 25 is the bore for long handle 3. 26 is the bore for steel bolt 12. 6A and 6B are cavities which will house the steel balls 16A and 16B and springs 16C and 16D. 7 is the rotating flange face of the rotating joint.

FIG. 16 These are the cross sections of 360 rotating flange of the rotating joint. on **"Y"** axis. 25 is the bore for long handle 3. 26 is the bore for steel bolt 12 to be inserted with washer 14A. 6A and 6B are cavities shown which will house the springs 16C and 16D and steel balls16A and 16B. 7 is the rotating flange face of the rotating joint.

FIG. 17 These are the cross sections of the stationary flange of the rotating joint. shown in "Y" axis. 27 is the bore for steel bolt 12 to accommodate the threaded side, washer 14B and nut 13 at the lower end. 8 is the flange face. 9 is the stationary flange body. 10 is the screw to secure the flange to the shovel blade body. 17, 18, 19, 20, 21, 22, 23 and 24 are the 8 concave recesses to accommodate the spring loaded steel balls for each of the 8 positions from the 360 degree rotating flange of the rotating joint for locking purposes.

FIG. 18, 19, 20 and 21 are the four positions of the 360 degree rotating flange joined with stationary flange shown from front elevation but rotated at 90 degrees from each other.

FIG. 22, is the side elevation of the blade body attached to the rotating joint assembly showing the angle details of the blade body female receptacle and the rotary flange female receptacle. Line 31 indicates the rotational axis line of the rotary joint assembly, line 32 which is at 22.5 degrees in relation to line 31 indicates the long handle connection angle with D shaped handle at the end or "Handle Offset Angle", line 30 indicates the face line angle of the blade body which is also at 22.5 degrees in relation to line 30 or "Blade Offset Angle", line 30A is a dotted line indicating a parallel line with the face line angle just to show more clarity.

FIG. 23, 24, 25, 26, 27, 28, 29 and 30 are top elevation of rotating flange shown rotated at 45 degree increment clock wise.

What is Claimed is:

1. The snow shovel and pusher combination with eight adjustable settings comprising:

a D shaped hand grip;

an elongated long handle having a first end and a second end;

a blade body with a first female receptacle;

a stationary flange with a male component, also an extended part of the stationary flange is a flat circular sliding face or flange face with 8 concave recesses at equal centre to centre distance from rotational axis of the flange, each of the recess is to provide a stop or lock position for each of the settings;

a rotary flange with a second female receptacle to be used for connecting to one end of the long handle, also an extended part of the stationary flange is a flat circular sliding face or flange face with two housings formed at the same centre to centre distance as the 8 concave recesses in the stationary flange, each to take up a spring loaded steel ball;

a set of a bolt, lock nut and two plain washers to assemble the stationary and rotary flanges together with the two spring loaded balls inside the housings of rotary flange, these components when assembled together is to be defined as “rotating joint assembly”;

the second female receptacle of the rotary flange is formed with an offset angle of 22.5 degrees in relation to the rotational axis of the rotating joint assembly, this angle is defined as the “handle offset angle”;

the blade body with the first female receptacle is also formed at 22.5 degrees in relation to the face line angle of the blade to take up the male

component of the stationary flange, this angle is defined as the “blade offset angle”;

the “handle offset angle” and the “blade offset angle” are required to create the eight adjustable settings of the snow shovel and pusher combination;

each 45 degree rotation of the D shaped hand grip on its rotational axis from one stop or lock position to next stop or lock position provides the operator to select one of the 8 adjustable settings of choice.

2. The snow shovel and pusher combination with eight adjustable settings of Claim 1, be used as a straight snow pusher with the D shaped hand grip parallel to the surface to be cleaned and blade body nearly vertical to the surface to be cleaned, this position is be defined as initial or start position.

3. The snow shovel and pusher combination with eight adjustable settings of Claims 1-2, the initial or start position be numbered as setting 1 and each consecutive clockwise rotation of 45 degree or next locking position be given numbers as 2, 3, 4, 5, 6, 7 and 8, then each consecutive movement of 45 degrees will bring the following changes to the use of this invention:

Position 2 will provide pushing and side shifting of snow simultaneously towards right;

Position 3 will provide pushing and relatively more side shifting of snow simultaneously towards right as compared to position 2;

Position 4 will provide pushing and relatively more side shifting of snow simultaneously towards right as compared to position 3 with some scooping action;

Position 5 will convert the pusher into shovel, at this stage the blade position will be horizontal to the surface to be cleaned and the D shaped hand grip will be parallel to the surface to be cleaned;

Position 6 will provide pushing and side shifting of snow simultaneously towards left as compared to position 5 with some scooping action;

Position 7 will provide pushing and relatively less side shifting of snow simultaneously towards left as compared to position 6;

Position 8 will provide pushing and relatively less side shifting of snow simultaneously towards left as compared to position 7.

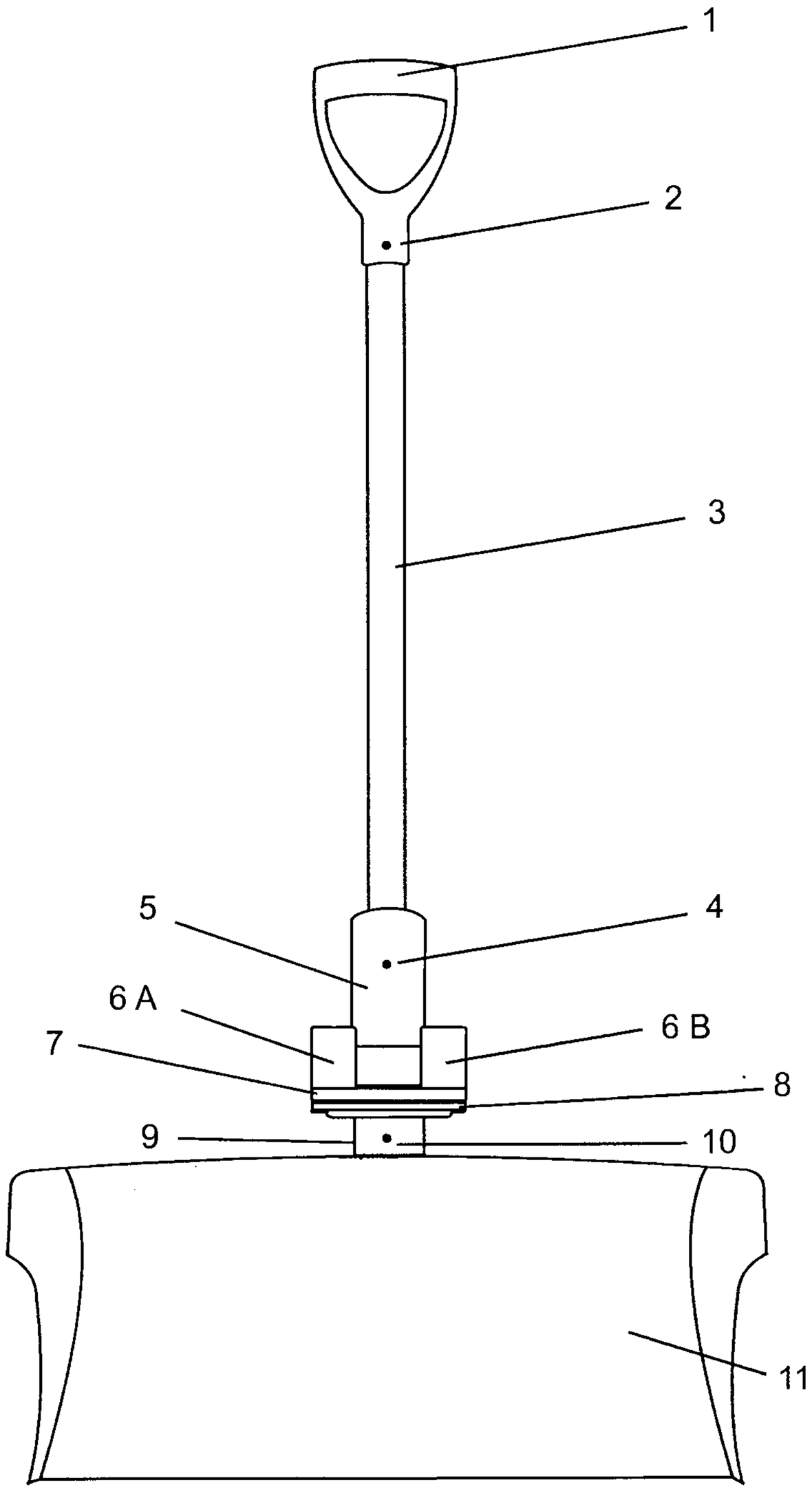


FIG. 1

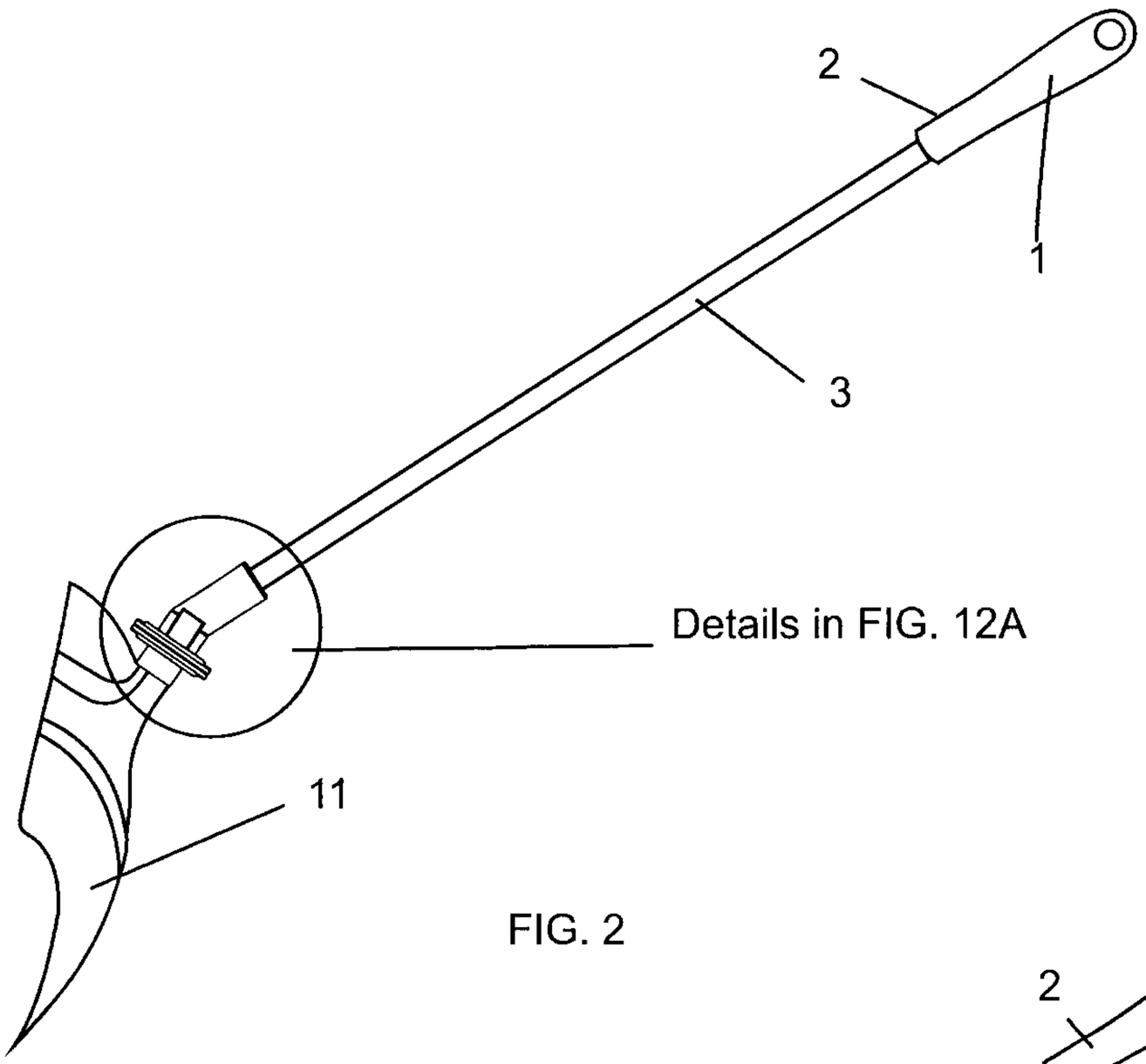


FIG. 2

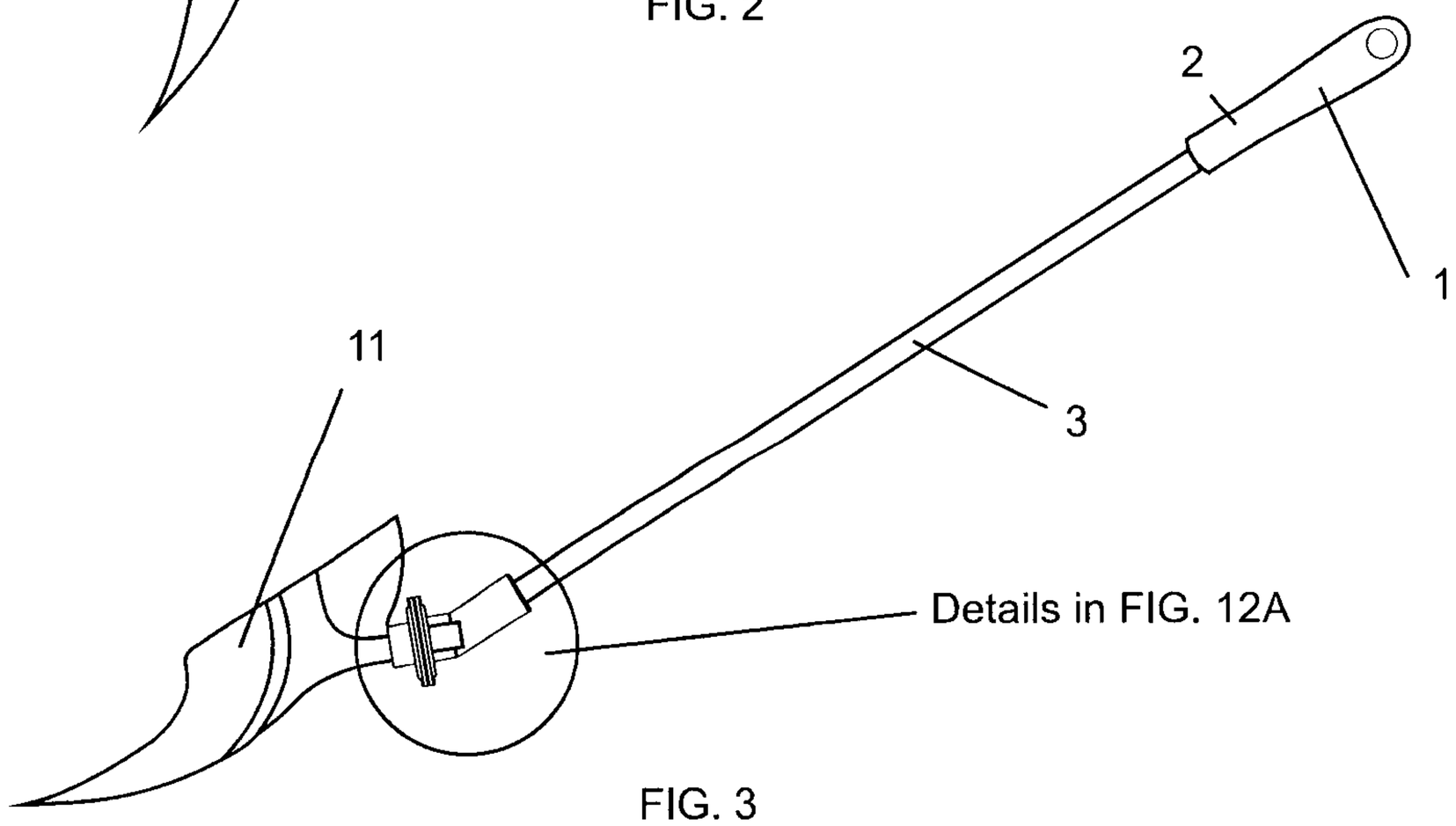


FIG. 3

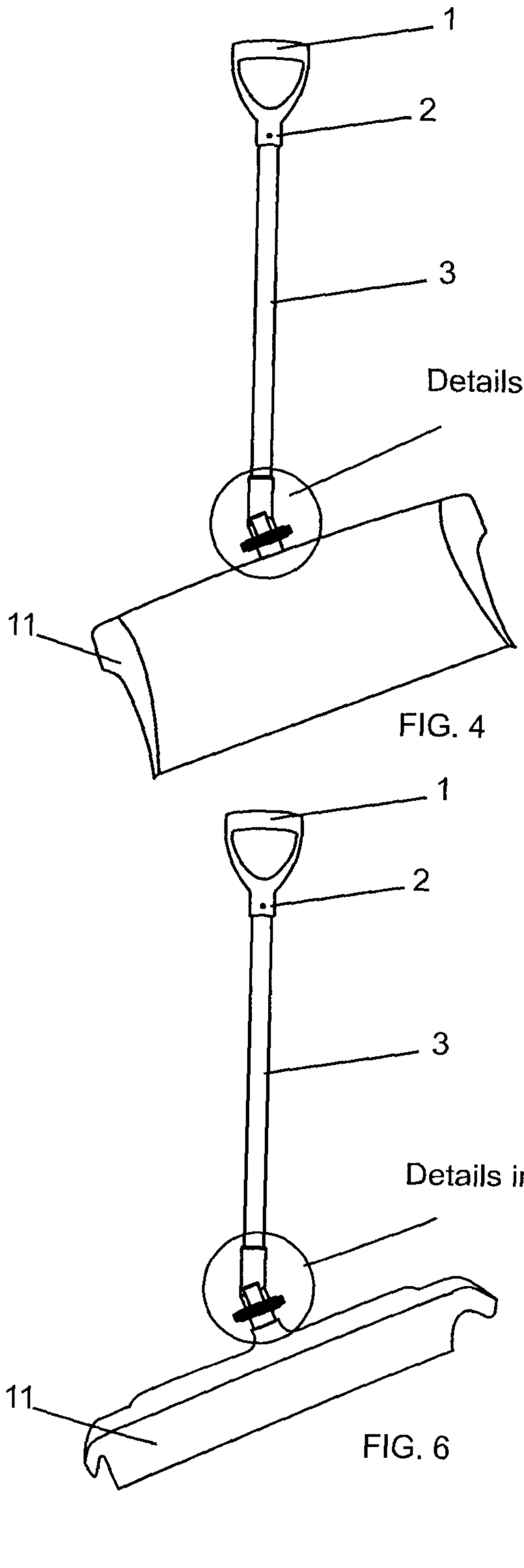


FIG. 4

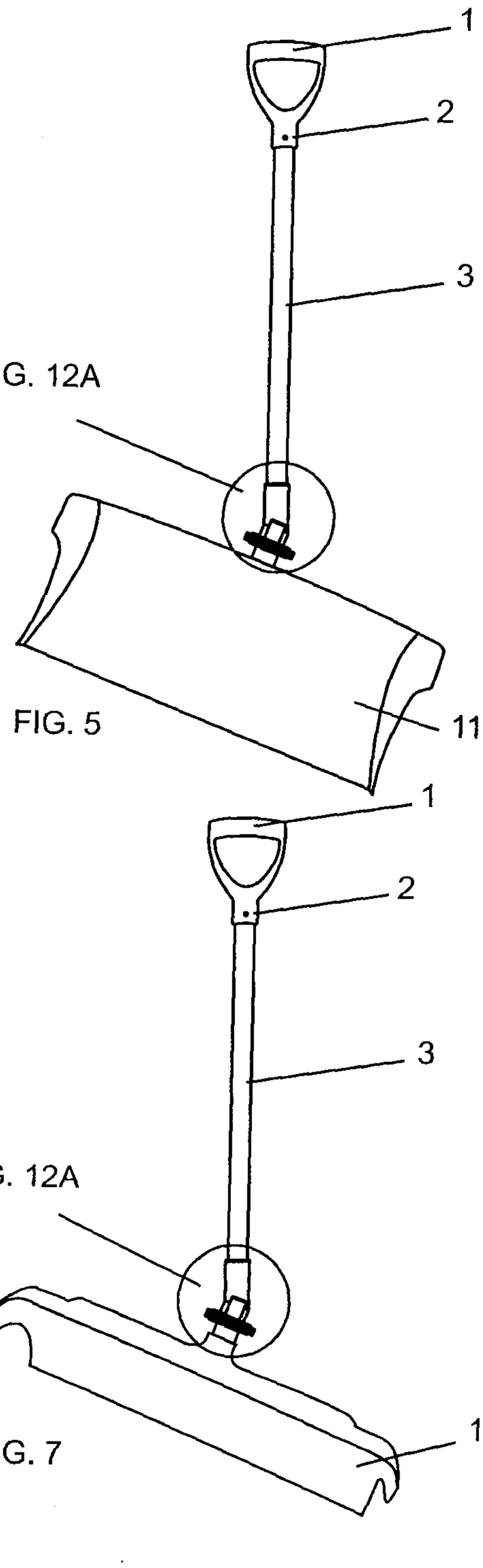


FIG. 5

FIG. 6

FIG. 7

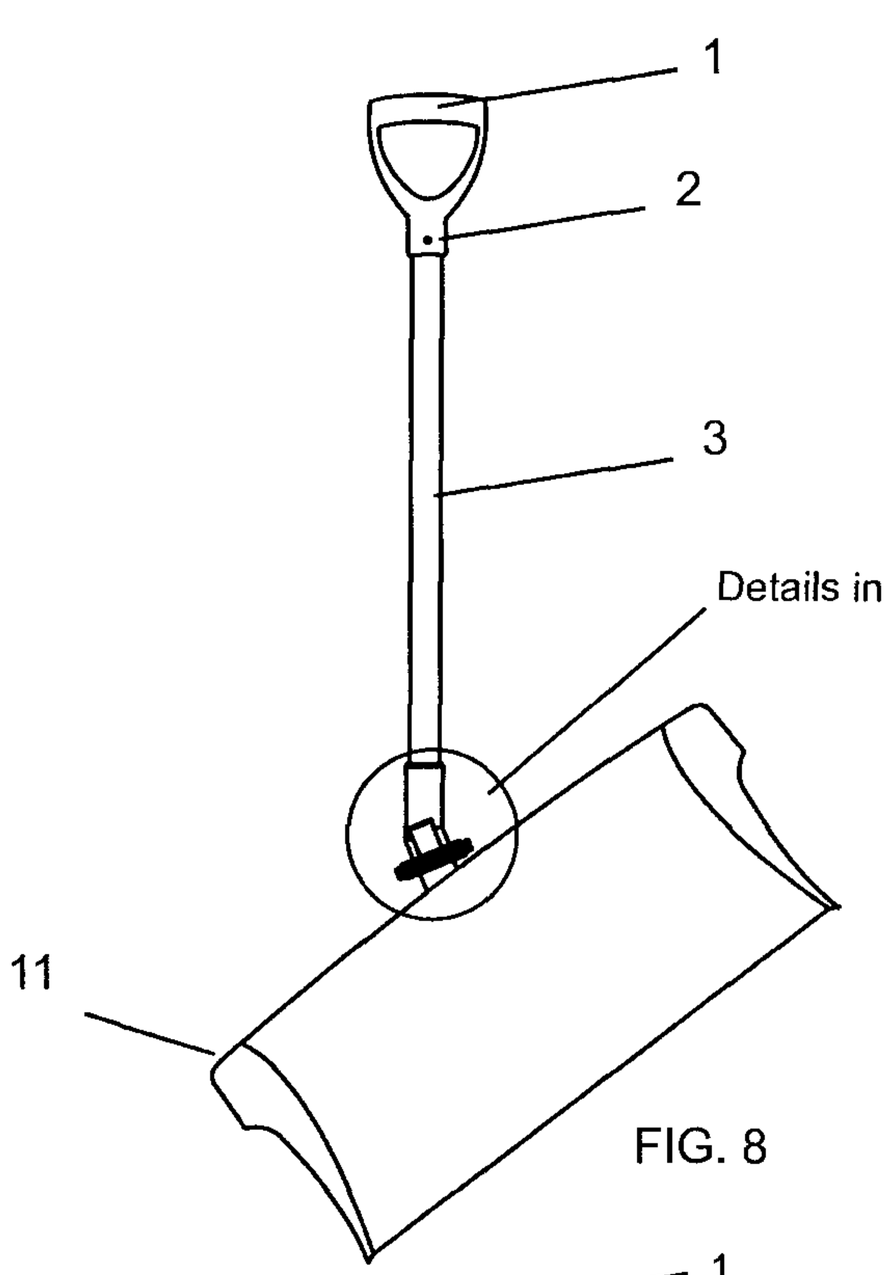


FIG. 8

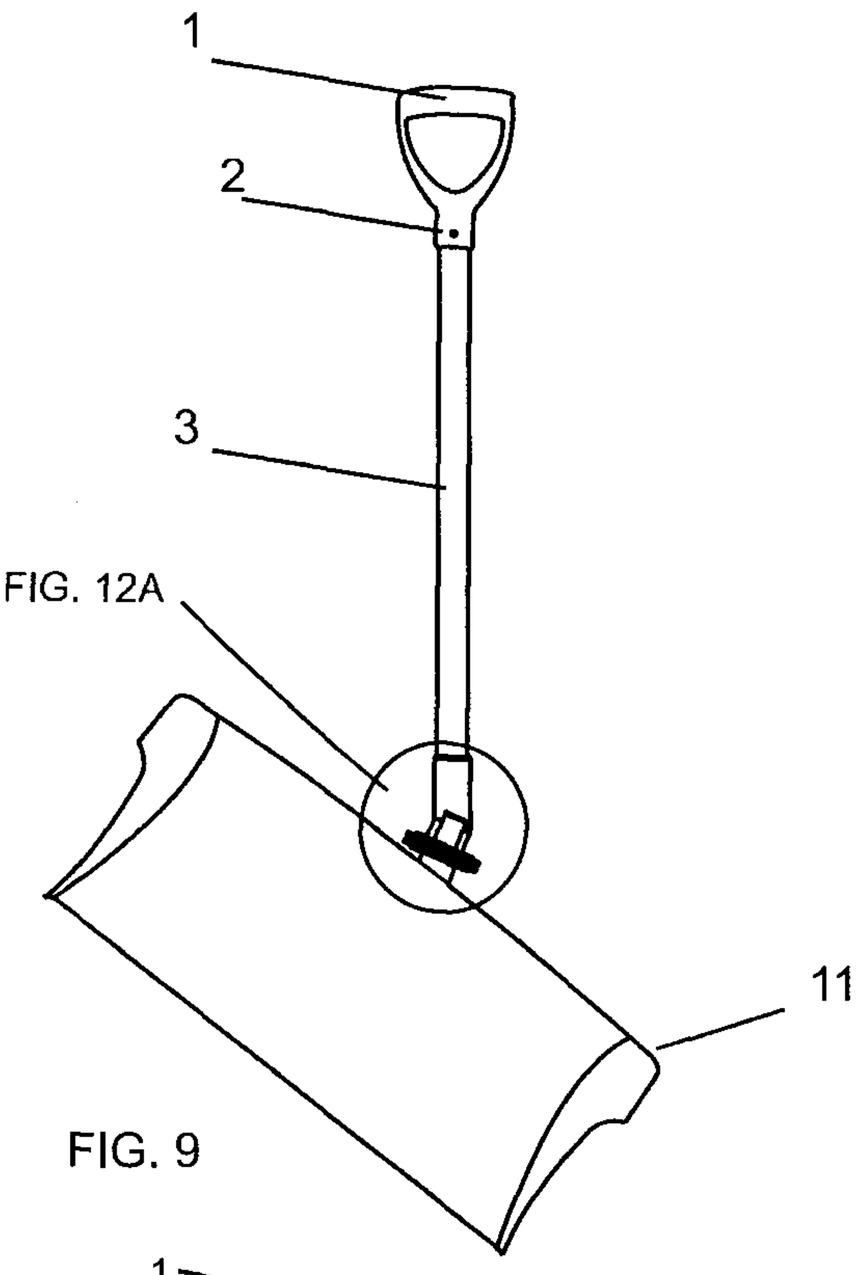


FIG. 9

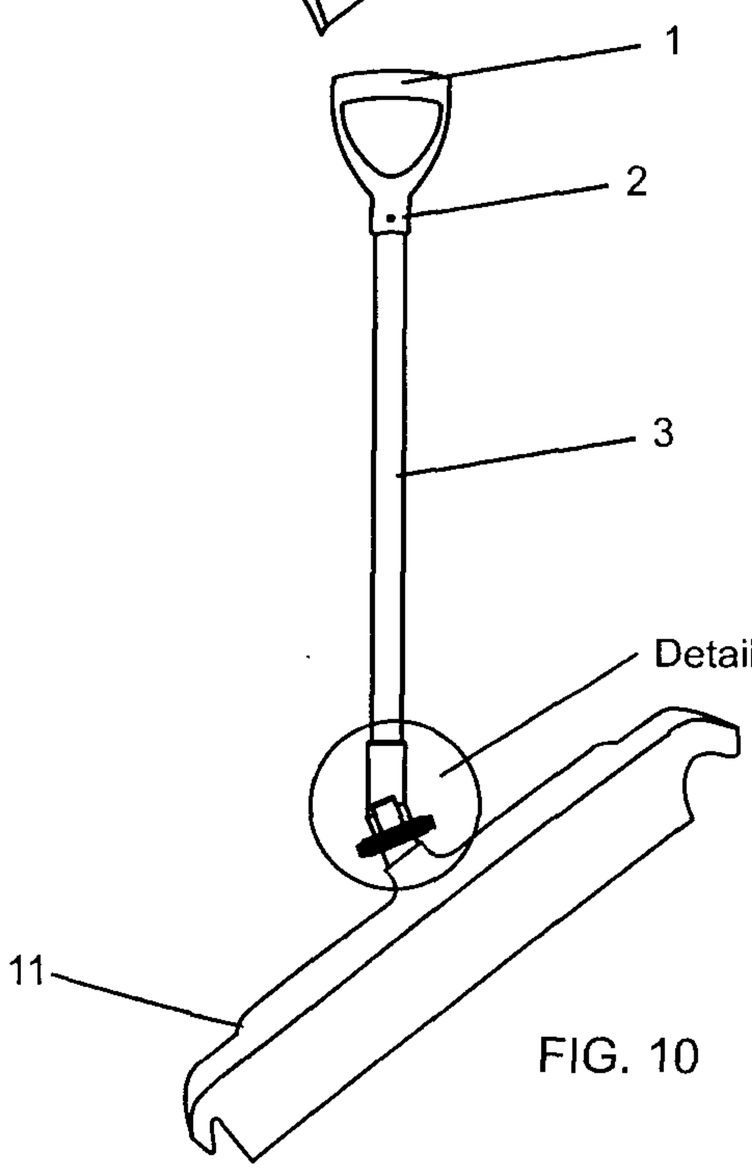


FIG. 10

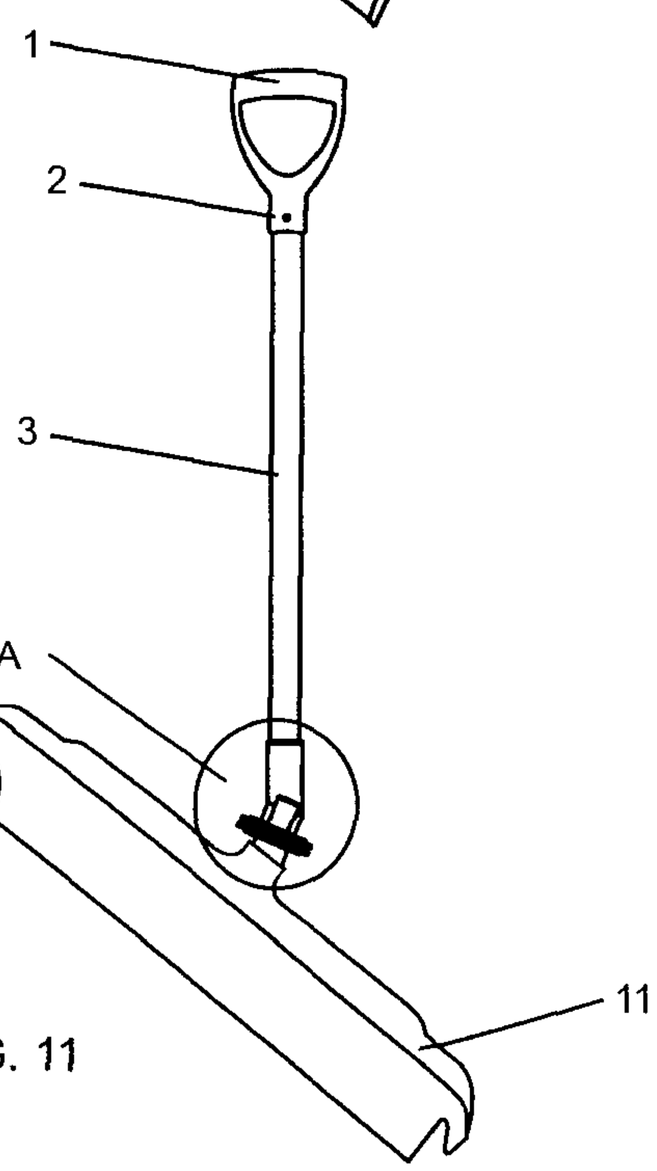


FIG. 11

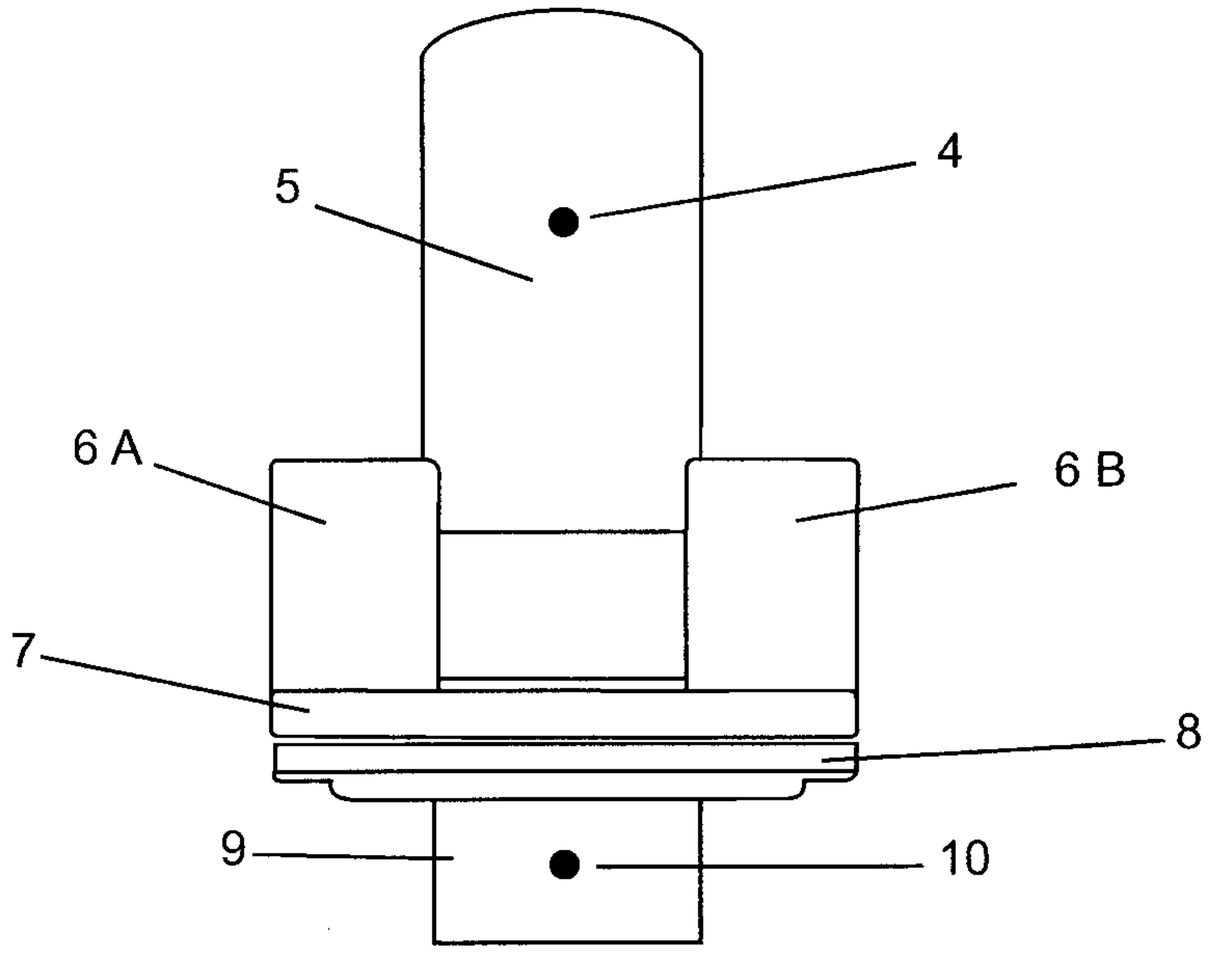


FIG. 12A

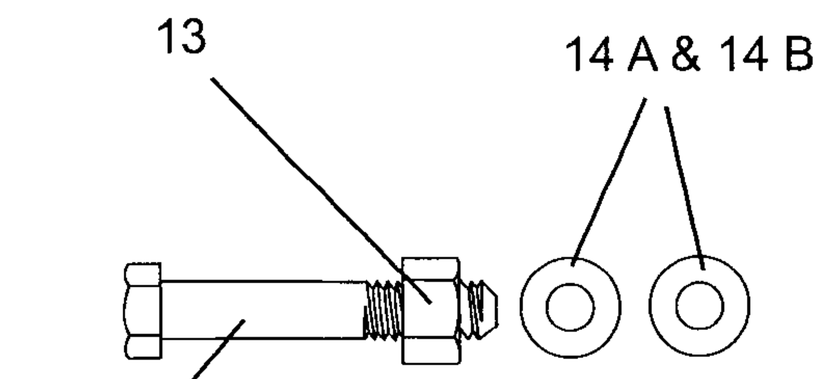


FIG. 12B

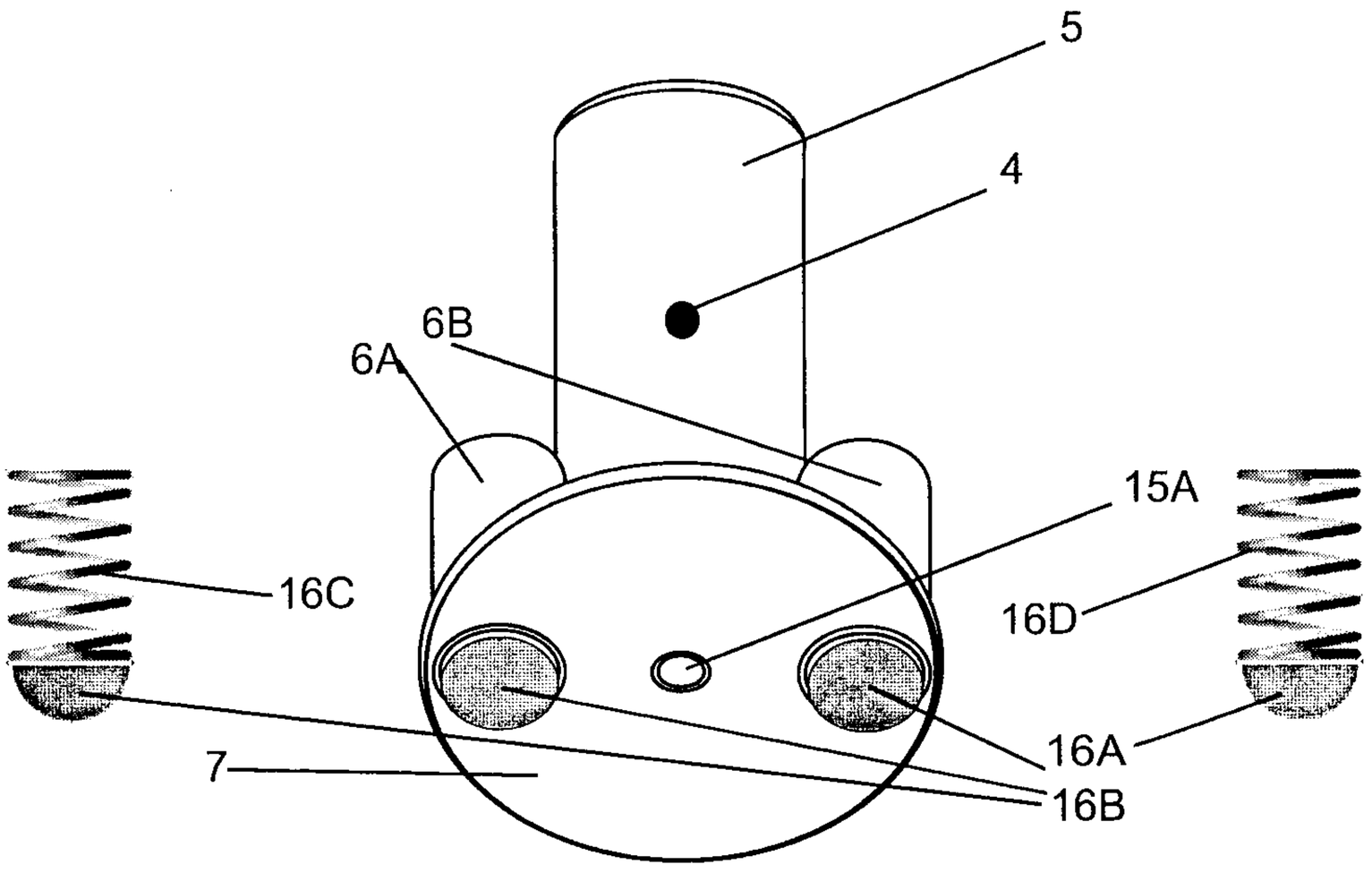


FIG13

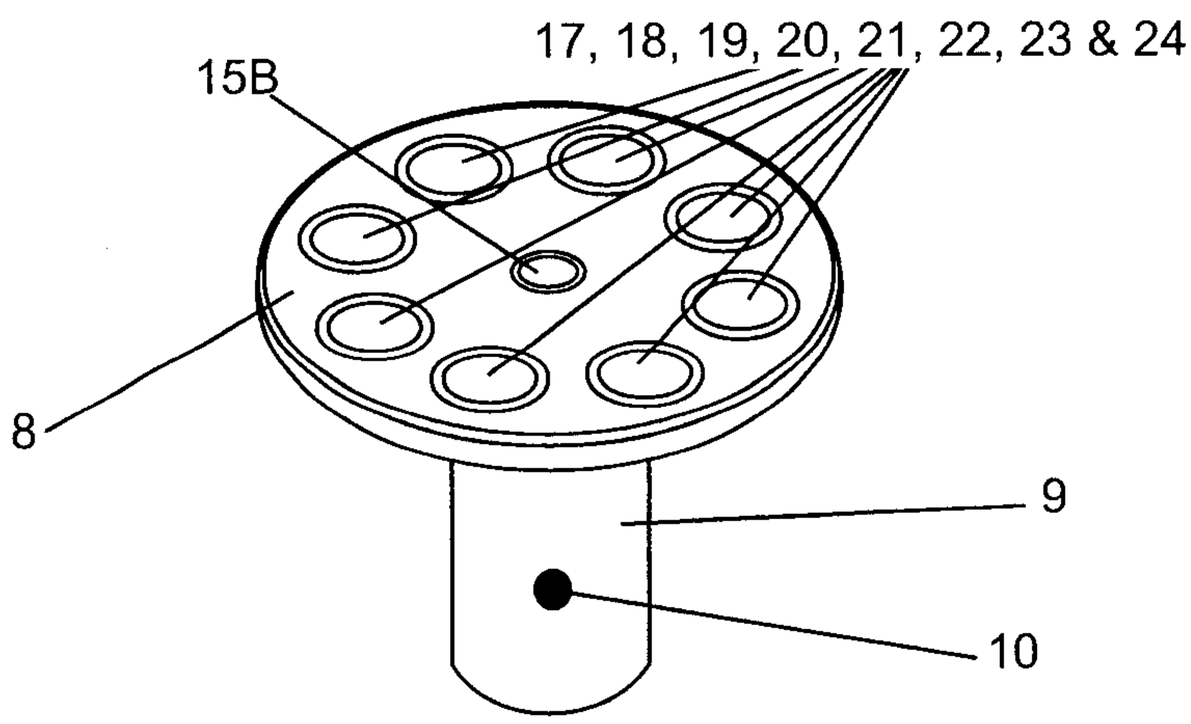


FIG. 14

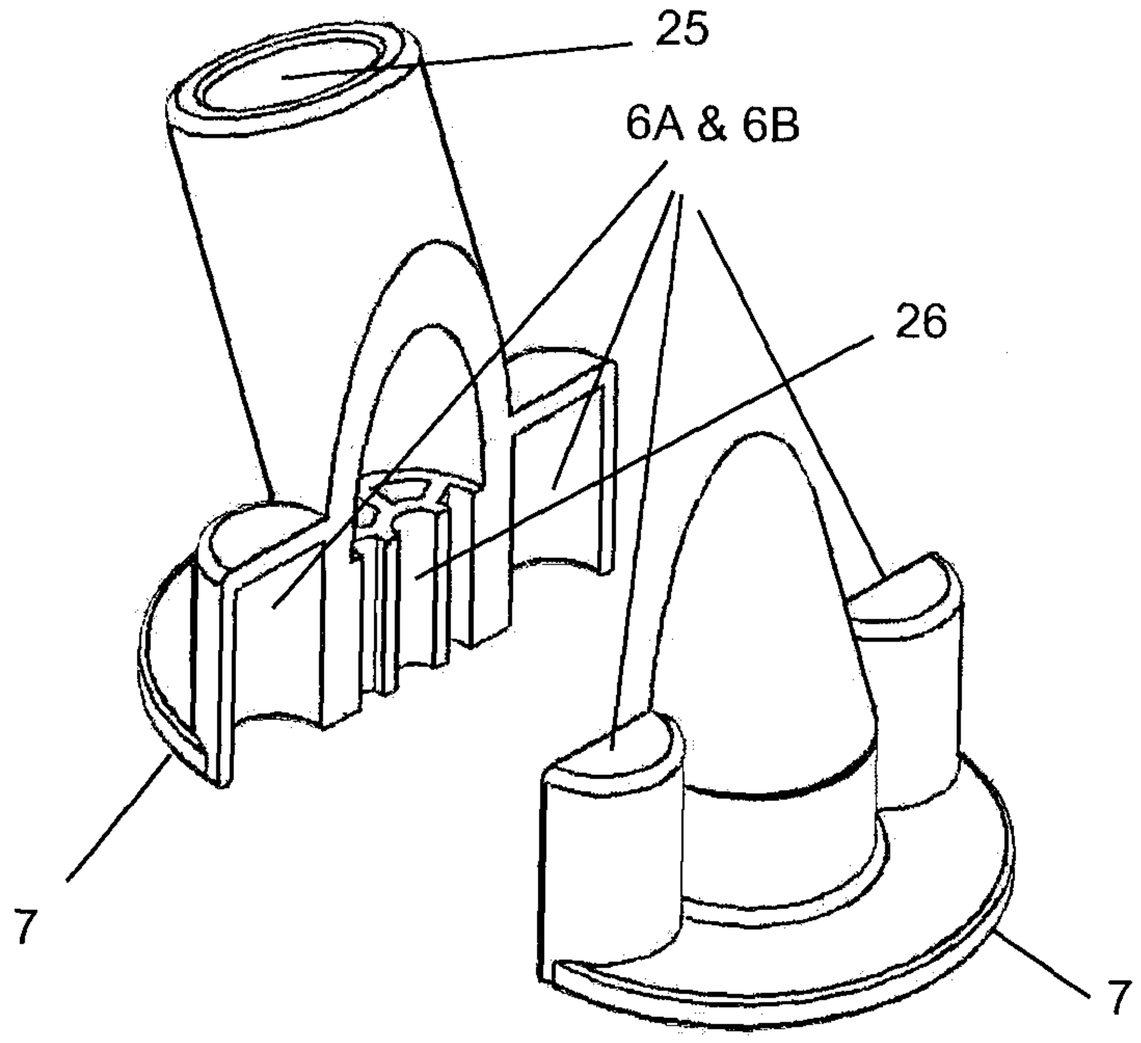


FIG. 15

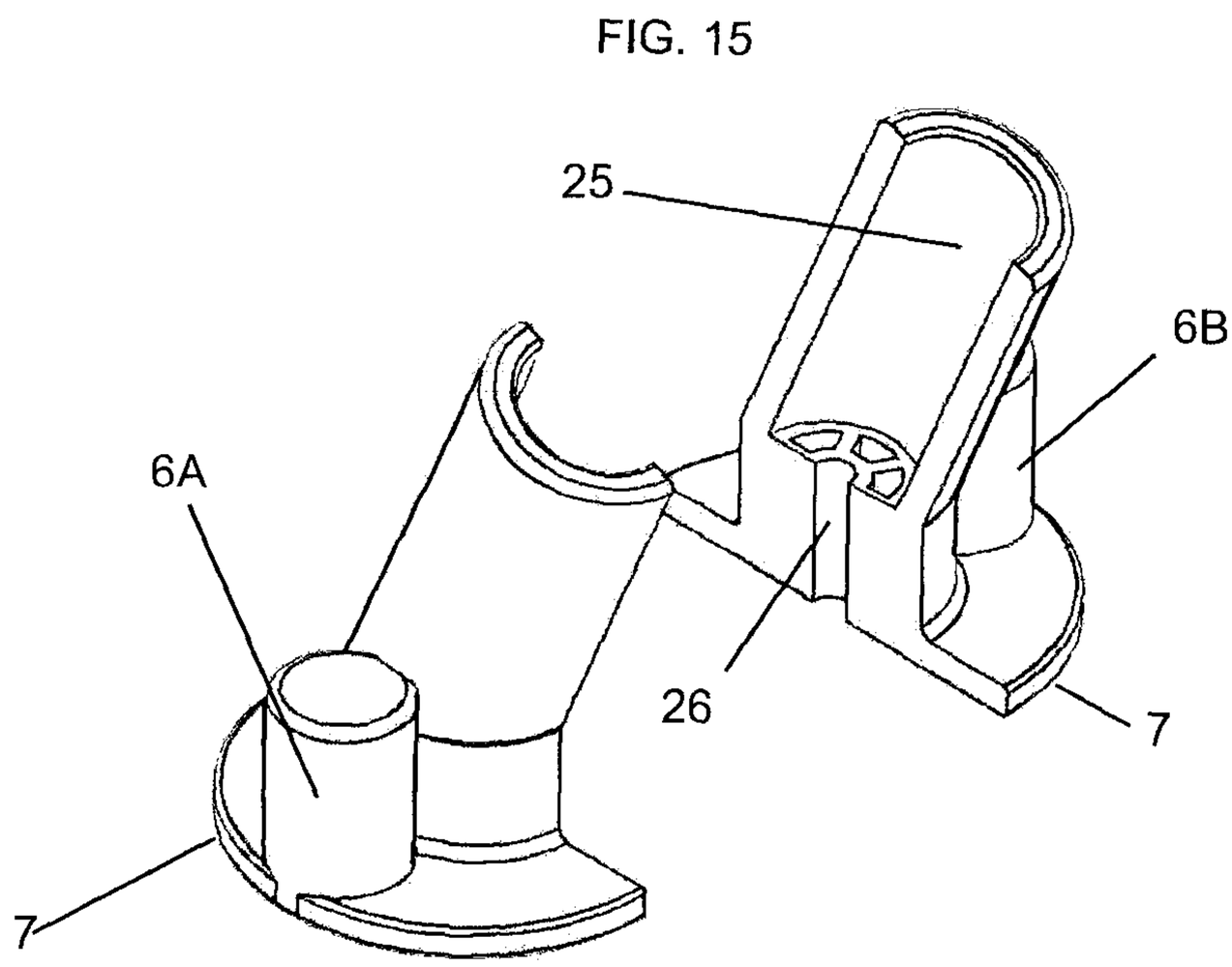


FIG. 16

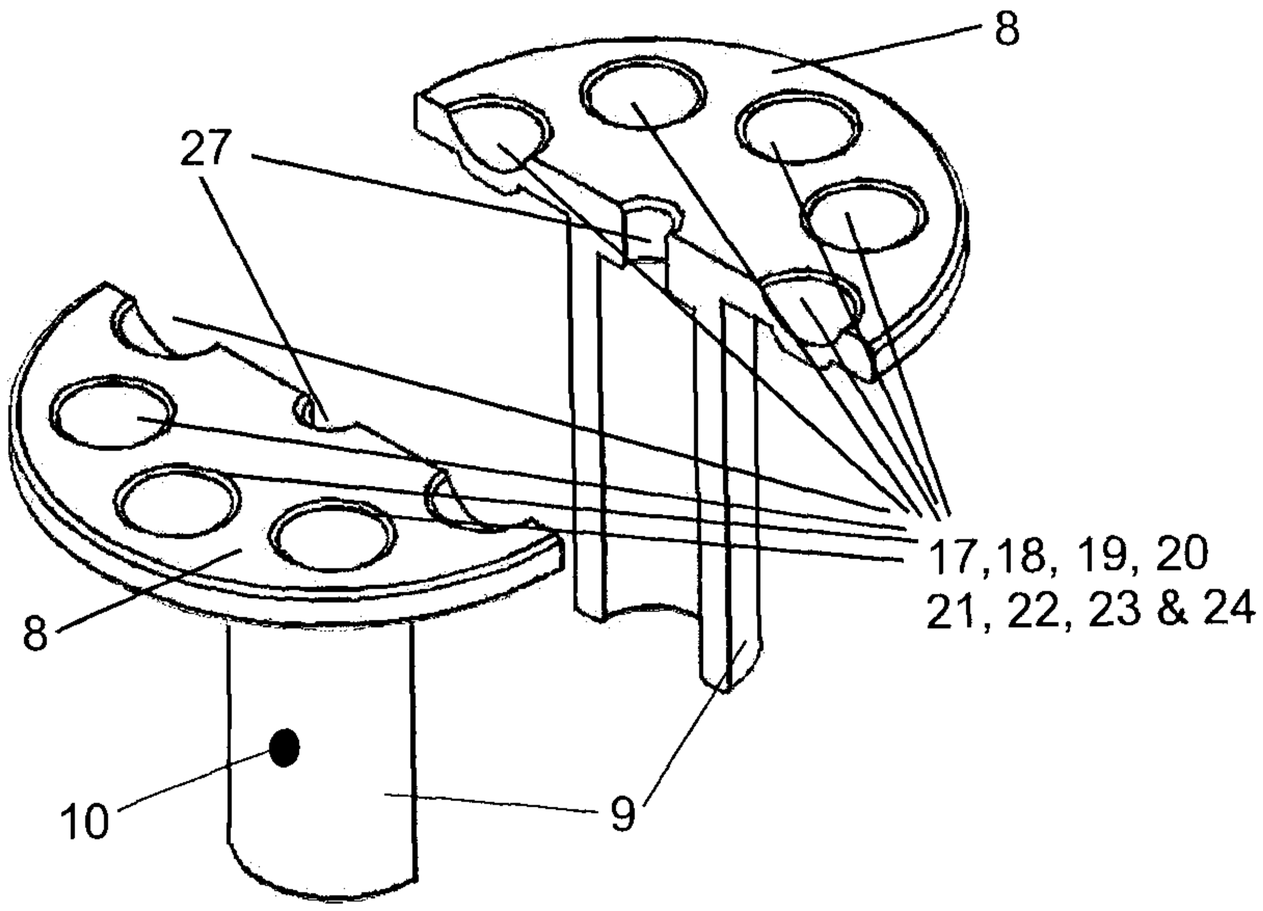


FIG. 17

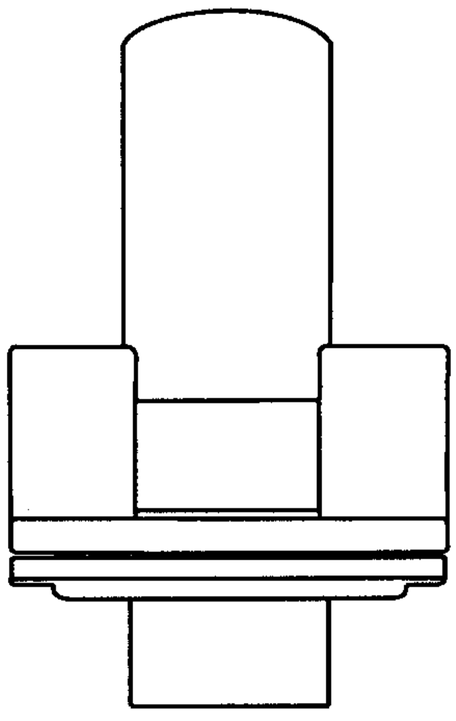


FIG. 18

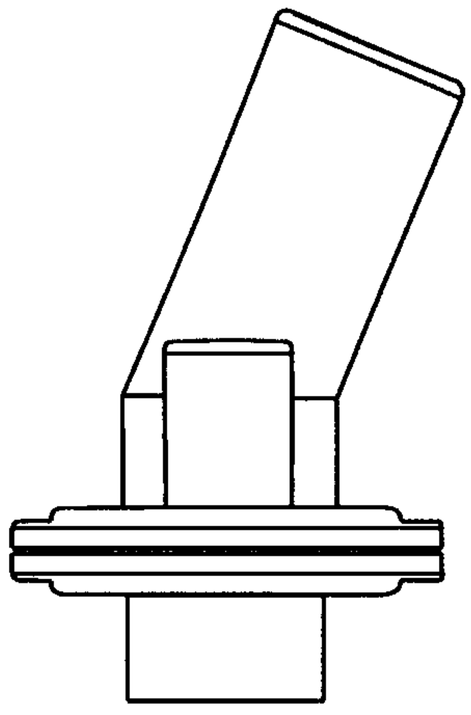


FIG. 19

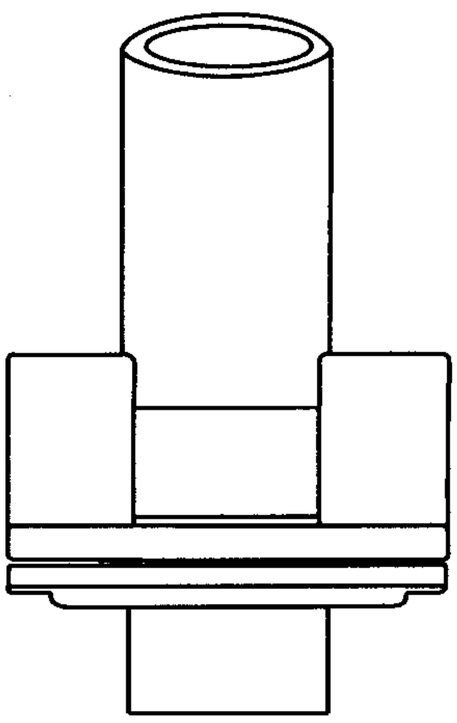


FIG. 20

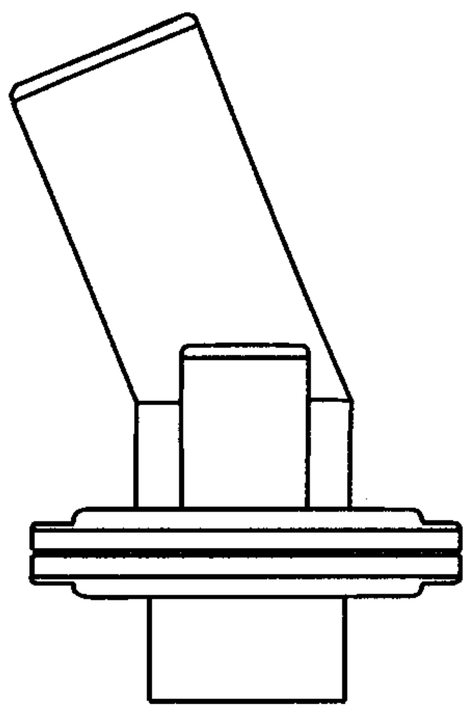


FIG. 21

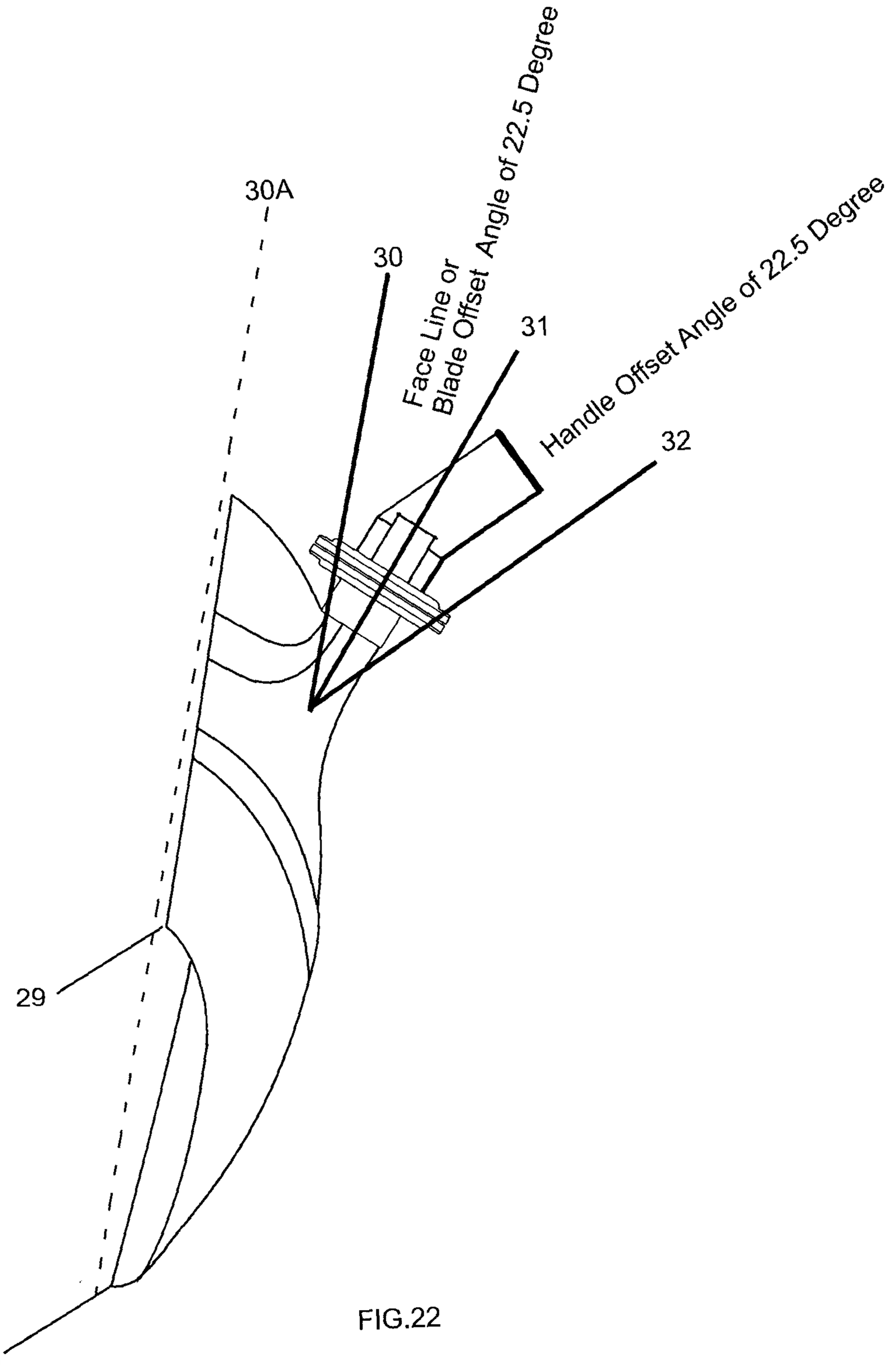

22.5 Degree
30A
30
Face Line or
Blade Offset Angle of
31
Handle Offset Angle of 22.5 Degree
32
29
28

FIG.22

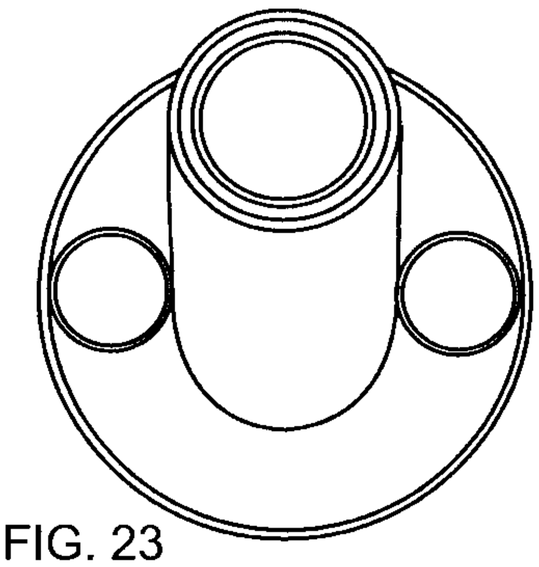


FIG. 23

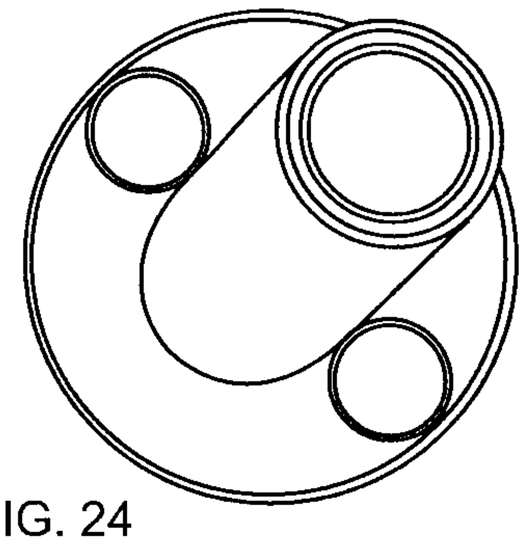


FIG. 24

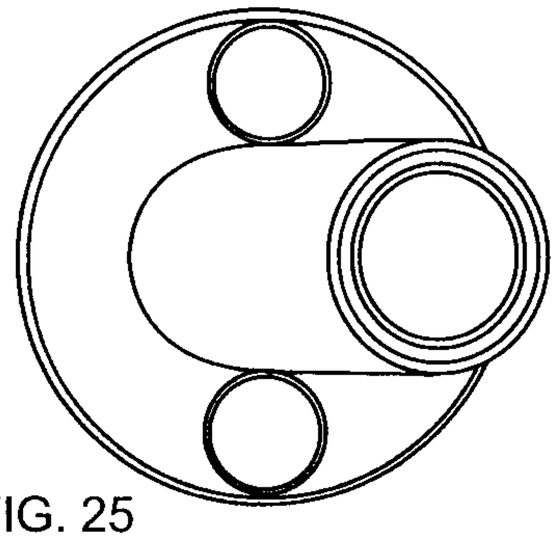


FIG. 25

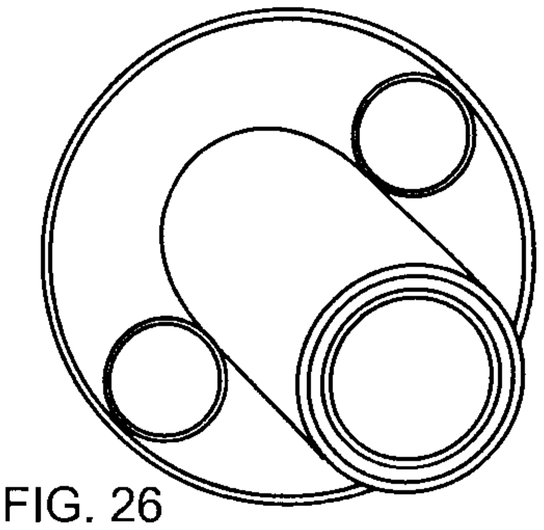


FIG. 26

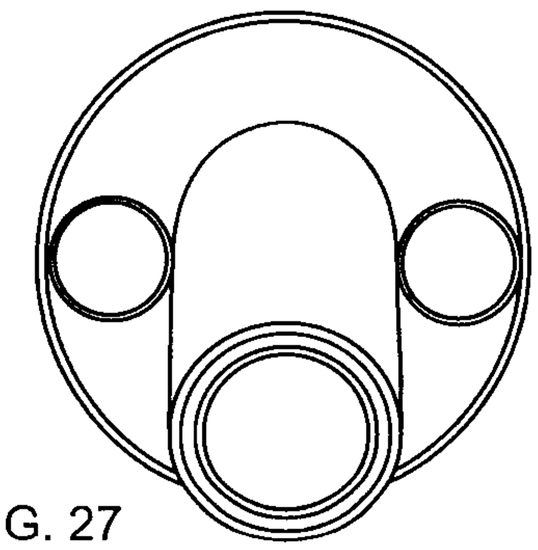


FIG. 27

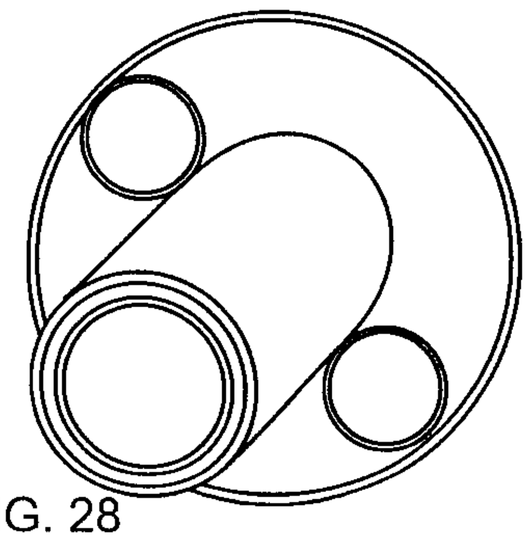


FIG. 28

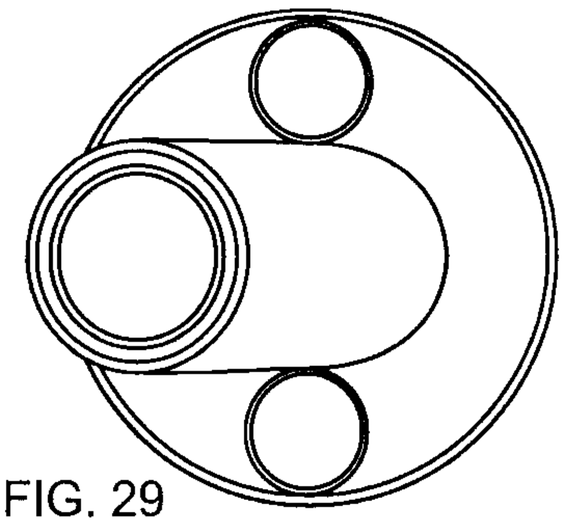


FIG. 29

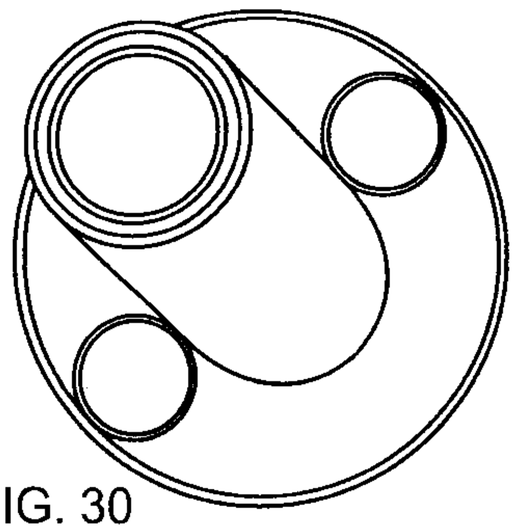
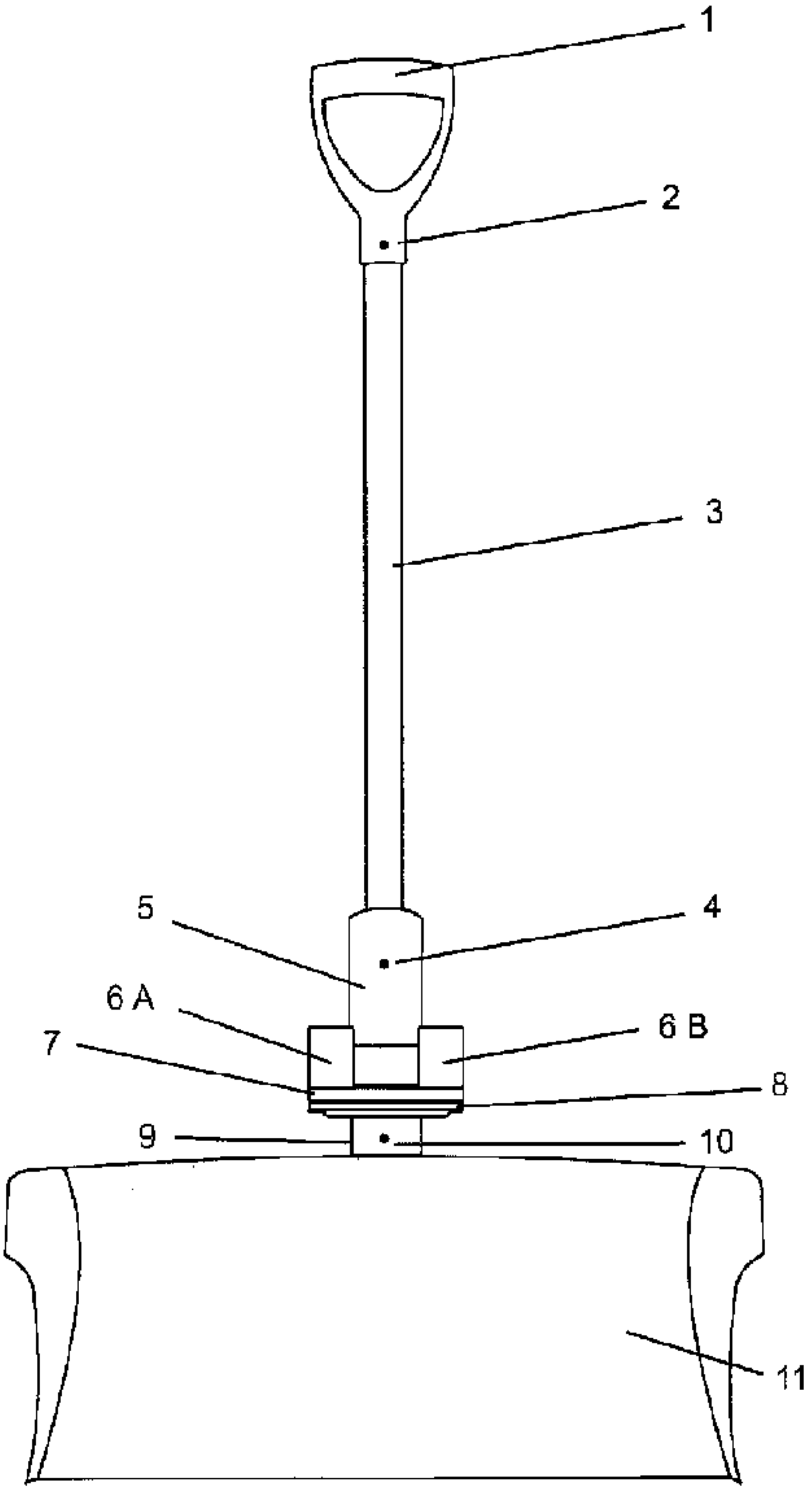


FIG. 30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