Sept. 13, 1949. W. M. ELIAS 2,481,733

SWIVEL VALVE JOINT

Filed Aug. 11, 1948 2 Sheets-Sheet 1

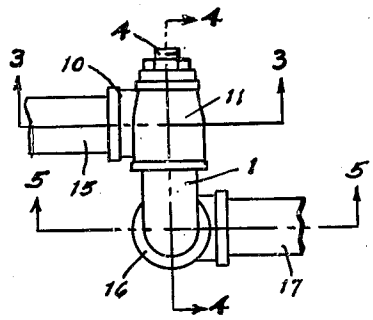


Fig 1

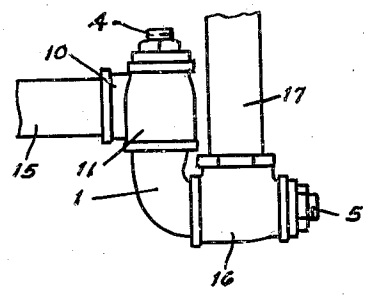


Fig 2

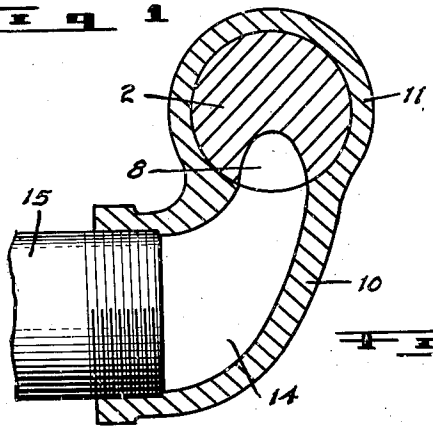


Fig 3

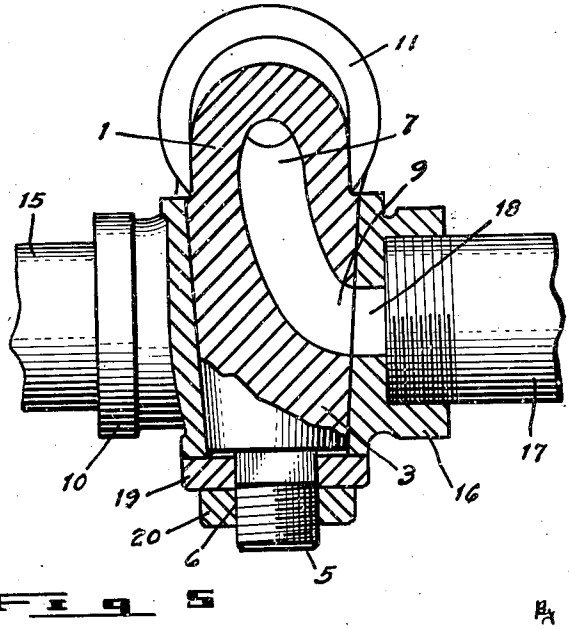


Fig 5

Inventor
W. M. Elias
By
Walter C. Briggs
Agent

Sept. 13, 1949. W. M. ELIAS 2,481,733

SWIVEL VALVE JOINT

Filed Aug. 11, 1948 2 Sheets-Sheet 2

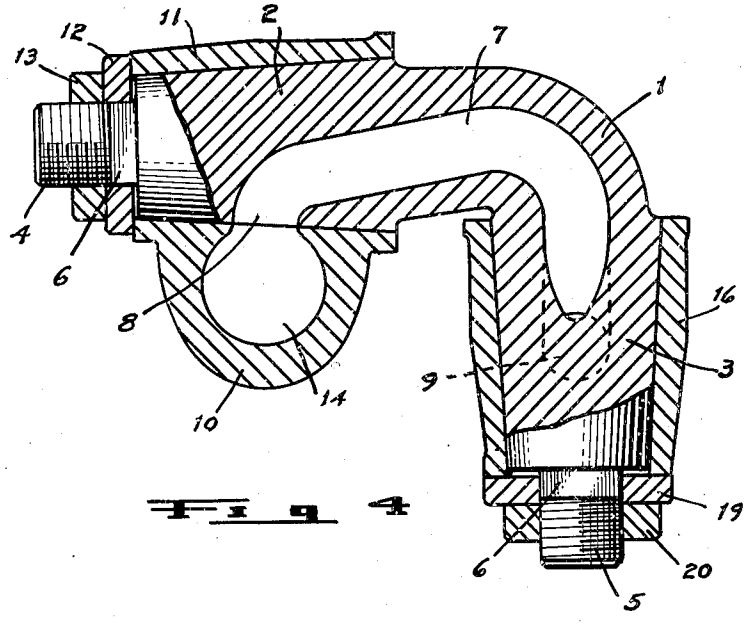


Fig 4

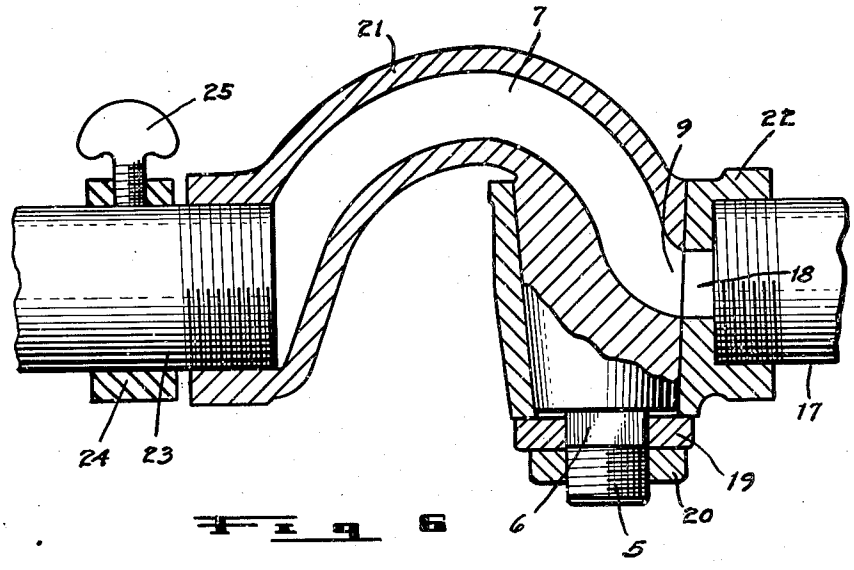


Fig 6

Inventor
W. M. Elias
By
Walter C. Boggs
Agent

Patented Sept. 13, 1949 2,481,733

UNITED STATES PATENT OFFICE

2,481,733

SWIVEL VALVE JOINT

William M. Elias, Winkler, Manitoba, Canada

Application August 11, 1948, Serial No. 43,616

4 Claims. (Cl. 277—69)

1

The invention relates to a pipe swivel joint and is particularly designed for use on farm spraying machines, and more particularly for machines used in weed spraying. These machines have a tank which contains the liquid to be sprayed, a power driven pump which delivers the liquid from the tank to a center pipe section directly at the back of the machine. At either side of the machine, a further pipe or boom projects outwardly from the machine and these pipes are swiveled, usually on hoses, at either end of the center section so that they can swing back, should they strike an obstruction. The center section and the booms are all at the same elevation, all have jets thereon for delivering the liquid over the ground and the side booms have suitable resilient means for holding them in the working position, said resilient means permitting the rear movement. The resilient means also bring them back. When these booms strike an obstruction and swing back, the liquid continues to be sprayed, and as the center section is also spraying, the same area of land receives the spray from both the center section and the swung back boom which is both wasteful and expensive.

The object of the present invention is to provide a swivel valve joint, between the center section and the side booms, which will maintain all sections at the same elevation when in operation, will permit either boom to swing back when struck by an obstruction, and which will shut off the flow to a boom when it is swung back and so prevent wasteful spraying of the land.

A further object of the invention is to provide a tight metallic connection between the sections, instead of a hose connection which will be positive in operation and will not break.

A further object of the invention is to construct the swivel joint so that the boom can swing back, as above described, and can also be swung into a storage position with the liquid supply positively shut off.

A still further object of the invention is to construct the device in a simple manner for cheapness of manufacture, tightness of the swivel connections to prevent leakage and will operate over a long period of time.

With the above important and other minor objects in view, which will become apparent as the description proceeds, the invention consists essentially in the construction and arrangement of parts hereinafter more particularly described, reference being had to the accompanying drawings in which—

2

Figure 1 is a plan view of a right hand joint in working position and partially showing the center section and a boom.

Figure 2 is a plan view of the joint shown in Figure 1 but with the boom swung into storage position.

Figure 3 is an enlarged vertical sectional view taken on the line 3—3, Figure 1.

Figure 4 is an enlarged vertical sectional view taken on the line 4—4, Figure 1.

Figure 5 is an enlarged vertical sectional view taken on the line 5—5, Figure 1.

Figure 6 is a vertical sectional view showing a modified construction of the joint.

In the drawings, like characters of reference indicate corresponding parts in the several figures.

The main body portion of the joint comprises an angle-shaped casting 1, of circular cross section. The ends 2 and 3 of this body portion are both machined to an outwardly converging taper, terminating in studs 4 and 5. The inner portions of the studs 6 are square and the outer portions threaded. The interior of the body portion is cored to provide a passageway 7 therethrough, the ends of the passageway curving outward at the center of each taper so as to form ports 8 and 9 thereon. In other words, the port 8 on the taper 2 is in communication, through the passageway 7, with the port 9 on the taper 3.

An elbow casting 10 is formed with a cross piece 11 at one end. This cross piece has the interior machined to a taper to correspond with the taper 2 of the body portion and is received thereover. A washer 12 fits snugly over the square portion 6 of the stud 4 and against the end of the cross piece while a nut 13 screws onto the threads and presses the washer against the cross piece to insure a tight fit in the tapers. The interior of the elbow casting is hollow as shown at 14 and this hollow passage is adapted to register with the port 8 of the taper 2 in the rotation of the elbow casting, therearound. The opposite end of the elbow casting is threaded onto a pipe 15 so that the pipe 15 can be in communication, through the passage 14, with the port 8 and can be shut off by rotation of the body portion 1.

The tapered end 3 of the body portion 1 receives a T member 16 which has one end machined to a taper to fit the tapered portion 3. The other end of the the T member is threaded to receive a pipe 17. A passageway 18 connects the interior of the pipe 17 with the tapered

portion of the T member and this passageway is adapted to register with the port 9 of the body portion 1 so that in the rotation the pipe 17 around the body portion, this port will move out of registration with the passage 18 and shut off communication. A washer 19 and nut 20, similar to the washer 12 and nut 13, are secured to the stud 5 in the same way to hold the taper 3 seated in the T member.

When this device is used on a weed spraying machine, it is made right and left for connection to each end of the center section. The center section would be equivalent to the pipe 15 shown. The right hand section boom would be equivalent to the pipe 17. In this connection it will be noticed that the boom is the same elevation as the pipe 15 but slightly back therefrom. The left hand boom, on the other side of the machine (not shown), will be aligned with the boom 17 so that the jets on the center section and the booms will be at the same elevation and the spraying will be uniform. The pump (not shown) on the machine will deliver the spraying liquid to the center section and from there it will pass through the swivel valve joints to the side section booms of the machine. In the movement of the machine over the ground, the section booms may strike exterior objects and will accordingly move back under the impact. In doing so, the T member 16 will turn on the taper 3 of the body portion and the passageway 18 will move out of registration with the port 9, thus shutting off the supply. When the obstruction has been passed, suitable resilient means (not shown) which are standard construction on such machines, will draw the boom back into place and the spraying liquid will again enter the pipe 17 and pass out the jets.

When the work of the machine is finished and it is being moved along roadways, through gateways or narrow passages, the booms will be swung upwardly. This will rotate the body portion on the elbow casting 10 so that the port 8 will move out of registration with the passageway 14 and shut off the supply from the center section. For storage purpose, the boom can be raised to a vertical position and then swung downward and forwardly to lie alongside of the machine, as shown in Figure 2. In this rotation of the boom 17, the T member will turn on the tapered portion 3 of the body portion which will pass the passageway 18 out of registration with the port 9. Accordingly, in such stored position the valve joint is shut off in two places which will positively insure that no leakage will result.

The device shown in Figure 6 is a modified form of the valve joint, using one swivel. In this device a hollow curved casting 21 is employed, and although shown for the right hand side of the machine, it can also be used on the left hand. One end of this casting, is provided with a T member 22 which corresponds to the T member 16 and the connections thereto are the same. The other end of the casting is threaded to one end of a pipe 23 which is the equivalent of the center section of the spraying machine. The center section is supported by a strap eye 24 in which the section can revolve, while a wing bolt 25 passes through the eye for locking the section against rotation. The opposite end of the center section (not shown) is the same.

By this arrangement the center section and the side boom are in alignment when in working position. The T member 22 permits the boom to swing horizontally backward to shut off the supply from the center section while the release of the wing bolt 25 permits vertical rotation of the assembled units. When the machine has completed its work and is traveling on the road, the boom sections are swung rearwardly on the T members 22 until their outer ends are touching or overlapping in a V at the back of the machine. The wing bolts 25 are then loosened and the two booms are swung together, on the center section, up and over against the back of the machine. The wing bolts are then tightened and the booms are in storage position.

What I claim as my invention is:

1. In a swivel valve joint: a hollow body member interconnected between a pair of pipes for fluid passage therebetween; said body member rotatable in fluid-tight mountings on said pipes; said mountings being rotatable in planes at right angles to each other; and port means in said mountings for shutting off the fluid passage between said pipes, in the rotation of one of said pipes in relation to said body member.

2. In a swivel valve joint: an angular body member, having circular tapers at each end, terminating in threaded studs; a passageway through said body member, starting at the surface of one taper and terminating at the surface of the other taper; casings rotatably mounted on said tapered ends of said body member and held thereto by screw means on said studs; a passage through each of said casings, registerable with the ends of said passageway at one point, in the rotation of said casings around said body member; and means on said casings for fluid connection thereto.

3. In a swivel valve joint: a curved body member having a hollow passageway therethrough and a circular tapered end; a casing releasably secured to said tapered end and rotatable thereon; a passage through said casing, registerable with the passageway in said body member at one point, in the rotation of said casing around said body member; pipe means connected to the opposite end of said body member and fluidly connected to the passageway therein; and pipe means connected to said casing, in communication with said passage and aligned with said first mentioned pipe means.

4. In a swivel valve joint: a right angled body member having circular tapered ends; a passageway through said body member with each end of said passageway terminating at a point on the sides of said taper to form a port; hollow tapered casings telescopically receivable over each of the tapered ends of said body member and rotatable thereon; passages through said casings, registerable with said ports at one location, in the rotation of same around said body member; means for attaching pipes to said casings for communication with said passages; and adjustable tightening means for retaining said casings on said body member.

WILLIAM M. ELIAS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,115,007	Neumeister	Oct. 27, 1914
1,403,396	Erickson	Jan. 10, 1922
2,217,712	Steelman	Oct. 15, 1940
2,272,544	Cerderston	Feb. 10, 1942