June 11, 1946. A. VASZIN 2,402,104

TOWLINE PLUG

Filed Jan. 19, 1945

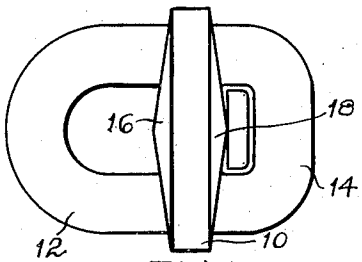


Fig. 1

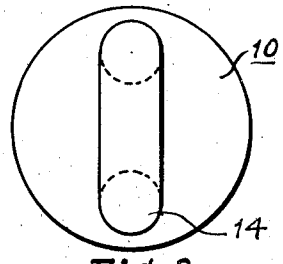


Fig. 2

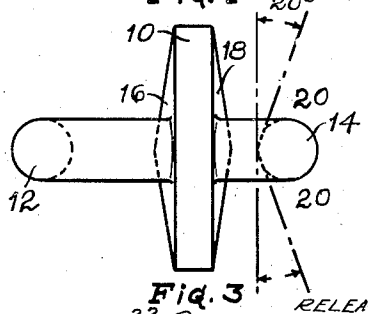


Fig. 3

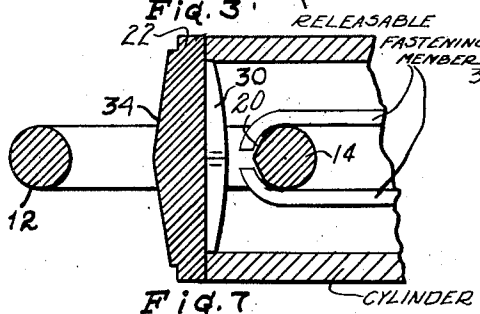


Fig. 7

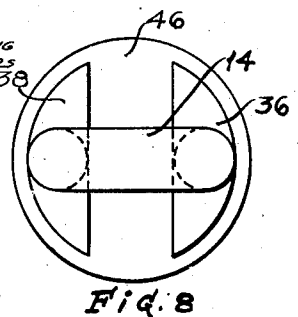


Fig. 8

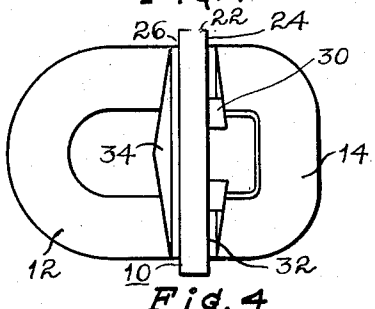


Fig. 4

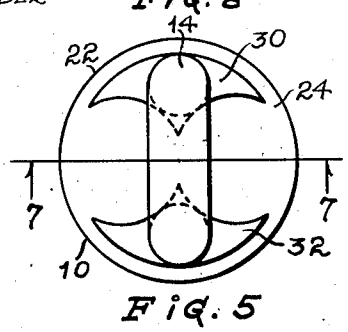


Fig. 5

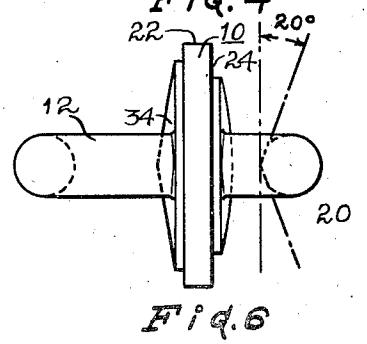


Fig. 6

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2,402,104

TOWLINE PLUG

Aurel Vaszin, Dayton, Ohio

Application January 19, 1945, Serial No. 573,607

7 Claims. (Cl. 280—33.15)

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This invention relates to a tow line plug and more particularly to a tow line plug adapted for use in tow lines for towing gliders, targets and the like by airplanes.

An object of this invention is to provide a tow line plug from a forging wherein the tow line plug has a pair of eyes or loops joined by a plate member having at least one face thereof tapered so as to be thicker at the center and provided with finished marginal portions adapted to engage a release cylinder.

Another object of this invention is to provide a tow line plug that is simple in construction yet dependable, efficient and economically produced.

Another object of this invention is to produce a tow line plug having islands integral with the retaining loop, which islands function as guides for centering the tow line plug in the retaining cylinder.

Other objects and advantages reside in the construction of parts, the combination thereof and the mode of operation, as will become more apparent from the following description.

Referring to the drawing, Figure 1 is a top plan view of a forging from which the plug is made before the forging has been finished.

Figure 2 is an end elevational view of the forging shown in Figure 1.

Figure 3 is a side elevational view of the forging shown in Figure 1.

Figure 4 is a top plan view of the plug after the forging shown in Figure 1 has been turned and finished.

Figure 5 is an end view of the plug shown in Figure 4.

Figure 6 is a side elevational view of the plug shown in Figure 4.

Figure 7 is a cross sectional view taken substantially on the line 7—7 of Figure 5.

Figure 8 is a modified tow line plug resulting from the use of a shaper used in removing surplus metal.

Figures 4, 5 and 6 have been drawn to a smaller scale than Figures 1, 2 and 3.

The method of producing the tow line plug disclosed herein has been claimed in my application for United States Letters Patent Serial No. 534,956 filed May 10, 1944, and ripening into United States Letters Patent No. 2,368,388 on January 30, 1945.

In towing gliders and the like by airplanes, the tow line is fixedly attached to a reel mounted in the airplane. The extreme end of the tow line is formed into a loop and engages a thimble like the one disclosed in my copending application Serial No. 533,607 filed May 1, 1944, for Tow line thimble, now Patent No. 2,381,193, granted Aug. 7, 1945.

A piston, not shown, is mounted on the glider. In this piston is located a releasably mounted

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plug, which plug is attached to the clevis integral with the thimble. The plug piece is forged from a bar of steel.

The forged plug is shown in Figures 1 to 3 inclusive and includes a disc-like portion 10 merging into a loop portion 12 on one side and a retaining loop portion 14 on the opposite side of the disc-like portion 10. The sides of the forged disc-like portion 10 taper, so as to provide thickened portions 16 and 18. The loop portion 12 is substantially circular in cross sectional area. The retaining loop portion 14 has a substantially circular cross sectional area throughout the greater portion of the periphery. A pair of retaining member facets 20 form a dihedral angle of approximately 140° with respect to each other. These facets are engaged by the retaining means mounted in the cylinder not disclosed herein, as the retaining means does not form a part of this invention. The piece shown in Figures 1 to 3 inclusive is preferably formed by die forging and is integral and homogeneous throughout.

Due to the fact that the disc-like portion 10 must be snugly seated in the end of the retaining cylinder, it is necessary to finish the surface of the disc-like portion throughout its entire margin. As may best be seen by referring to Figures 4, 5 and 6, the margin 22 has been turned so as to be cylindrical. The face 24 has been turned, so has the face 26. In addition to turning the face 24, the central portion 28 has also been machined by the use of any suitable machine for removing metal, such as a shaping machine or routing tool in an end milling machine, so as to have a flat area throughout the entire side with the exception of the island portions 30 and 32 surrounding the ends of the loop portion 14. These island portions 30 and 32 help to center the plug in the cylinder, in that the island portions 30 and 32 are bounded by arcuate margins. The convex margins of the island portions provide seats for the cylinder. The concave margins are the result of the machining operation. In addition thereto, these island portions provide reenforcements, reenforcing the disc-like portions 10 in the vicinity of the legs of the retaining loop portion 14. The face 26 of the disc-like portion 10 terminates in a thickened portion 34 that extends throughout the center of the disc and gives the disc rigidity.

In the modification disclosed in Figure 8 a channel-like finished surface 46 extends under the loop 14 and is subtended by islands 36 and 38 surrounding the ends of the loop portion 14. One side of each of these islands is straight and the other side is arcuate, forming a seat for centering the tow line plug with respect to the cylinder. This channel portion 46 is produced by any suitable machine, as for example, a shaper. The channel portion 46 provides a clearance for the

gripper jaws engaging the facets 20 of the loop 14.

The plug disclosed herein is easily produced by forging and easily machined, resulting in a strong, homogeneous plug without the use of welding and without the use of a plurality of parts. The forging, after it has been machined, may be either annealed or tempered or otherwise heat-treated, so as to have the proper hardness. For the purpose of preservation, the finished article may be cadmium plated, zinc plated or otherwise coated.

Although the preferred embodiment of the device has been described, it will be understood that within the purview of this invention various changes may be made in the form, details, proportion and arrangement of parts, the combination thereof and mode of operation, which generally stated consist in a device capable of carrying out the objects set forth, as disclosed and defined in the appended claims.

Having thus described my invention, I claim:

1. A homogeneous release plug for coupling the thimble of a tow line to a cylinder provided with releasable fastening members, said release plug including a disc-like portion provided with a cylindrical periphery having a finished surface, one side of the disc-like portion being provided with a pair of island portions, each of which is provided with an arcuate marginal portion adapted to engage the cylinder, a retaining loop projecting from the island portions, said retaining loop including a pair of facets forming a 140° dihedral angle, the opposite side of the disc-like portion being provided with a thickened portion, a loop portion extending from the thickened portion adapted to engage the thimble of the tow line.

2. A homogeneous release plug for coupling the thimble of a tow line to a cylinder provided with releasable fastening members, said release plug including a disc-like portion provided with a cylindrical periphery having a finished surface, one side of the disc-like portion being provided with a pair of island portions, each of which is provided with an arcuate marginal portion adapted to engage the cylinder, a retaining loop projecting from the island portions, said retaining loop including a pair of facets forming a 140° dihedral angle, a finished surface extending under the retaining loop from one side of the disc-like portion to the opposite side thereof forming a clearance for the fastening members, the opposite side of the disc-like portion being provided with a loop portion extending therefrom and adapted to engage the thimble of the tow line.

3. A homogeneous release plug for coupling the thimble of a tow line to a cylinder provided with releasable fastening members, said release plug including a disc-like portion provided with a cylindrical periphery having a finished surface, one side of the disc-like portion being provided with a pair of island portions, each of which is provided with an arcuate marginal portion adapted to engage the cylinder, a retaining loop projecting from the island portions, said retaining loop including a pair of facets forming a 140° dihedral angle, a channel groove extending between the islands under the loop from margin to margin of the disc-like portion, said channel groove forming a clearance for the fastening members, the opposite side of the disc-like portion being provided with a loop portion extending

therefrom, which loop portion is adapted to engage the thimble of the tow line.

4. A homogeneous release plug for coupling the thimble of a tow line to a cylinder provided with releasable fastening members, said release plug including a disc-like portion provided with a cylindrical periphery having a finished surface, one side of the disc-like portion being provided with a pair of island portions, each of which is provided with an arcuate marginal portion adapted to engage the cylinder, a retaining loop projecting from the island portions, a finished surface extending under the retaining loop from one side of the disc-like portion to the opposite side thereof forming a clearance for the fastening members, the opposite side of the disc-like portion being provided with a loop portion extending therefrom and adapted to engage the thimble of the tow line.

5. A homogeneous release plug for coupling the thimble of a tow line to a cylinder provided with releasable fastening members, said release plug including a disc-like portion provided with a cylindrical periphery having a finished surface, one side of the disc-like portion being provided with a pair of island portions, each of which is provided with an arcuate marginal portion adapted to engage the cylinder, a retaining loop projecting from the island portions, a channel groove extending between the islands under the loop from margin to margin of the disc-like portion, said channel groove forming a clearance for the fastening members, the opposite side of the disc-like portion being provided with a loop portion extending therefrom, which loop portion is adapted to engage the thimble of the tow line.

6. A homogeneous release plug for coupling the thimble of a tow line to a cylinder provided with releasable fastening members, said release plug including a disc-like portion provided with a cylindrical periphery having a finished surface, one side of the disc-like portion being provided with a pair of island portions, each of which is provided with an arcuate marginal portion adapted to engage the cylinder, a retaining loop projecting from the island portions, the area between the islands lying in a plane common to the plane of the margin of the disc-like portion, said area providing clearance for the movement of the fastening members, the opposite side of the disc-like portion being provided with a thickened portion, a loop portion extending from the thickened portion adapted to engage the thimble of the tow line.

7. A homogeneous release plug for coupling the thimble of a tow line to a cylinder provided with releasable fastening members, said release plug including a disc-like portion provided with a cylindrical periphery having a finished surface, one side of the disc-like portion being provided with a pair of island portions, each of which is provided with an arcuate marginal portion adapted to engage the cylinder, a retaining loop projecting from the island portions, a channel extending between the islands under the loop from opposite margins of the disc-like portion, said channel providing clearance for the fastening members, the opposite side of the disc-like portion being provided with a thickened portion, a loop portion extending from the thickened portion adapted to engage the thimble of the tow line.

AUREL VASZIN.