Dec. 19, 1939. D. H. CAMPBELL ET AL 2,183,540

TARGET TOWING DEVICE

Filed Dec. 20, 1938 2 Sheets-Sheet 1

Fig. 1.

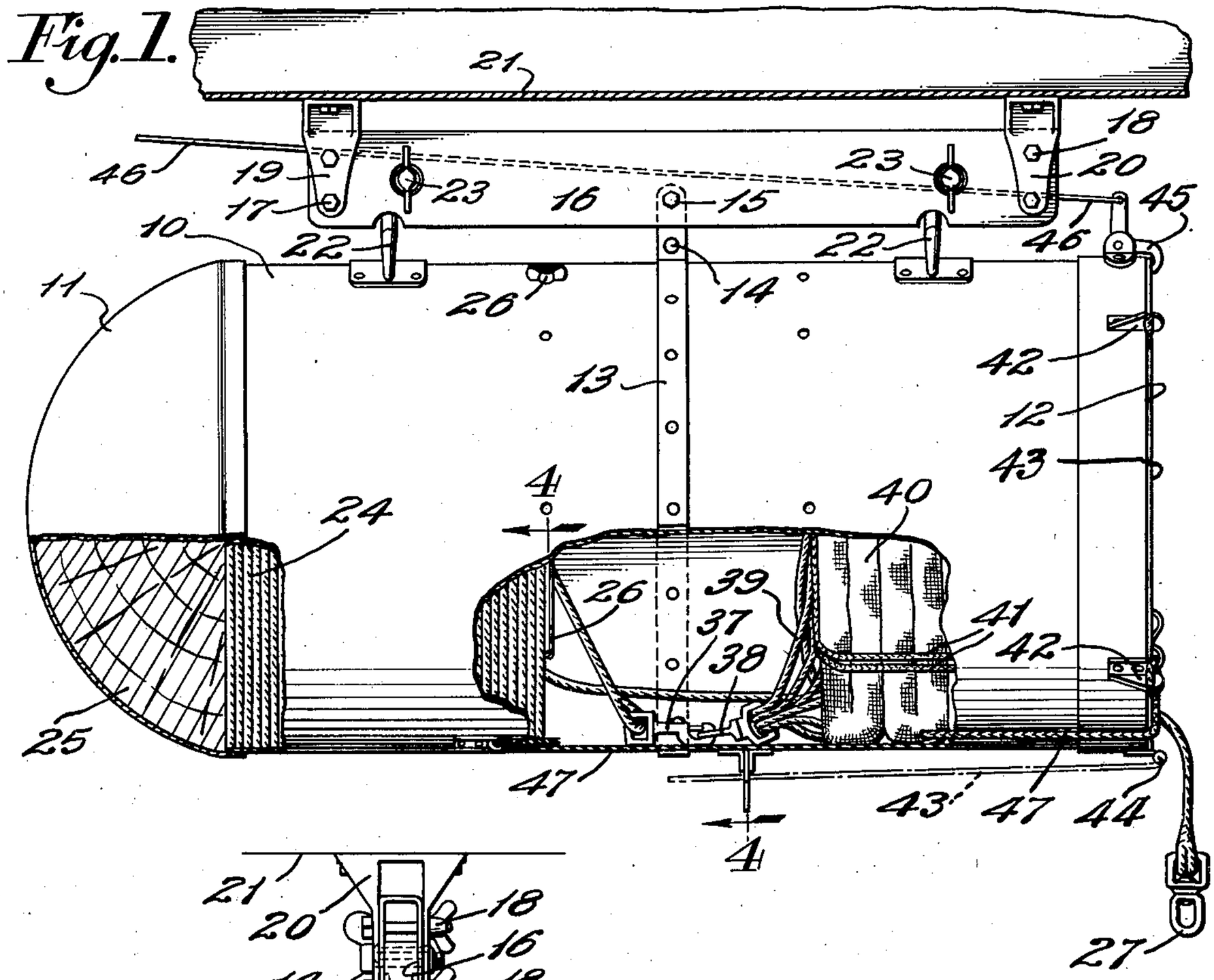
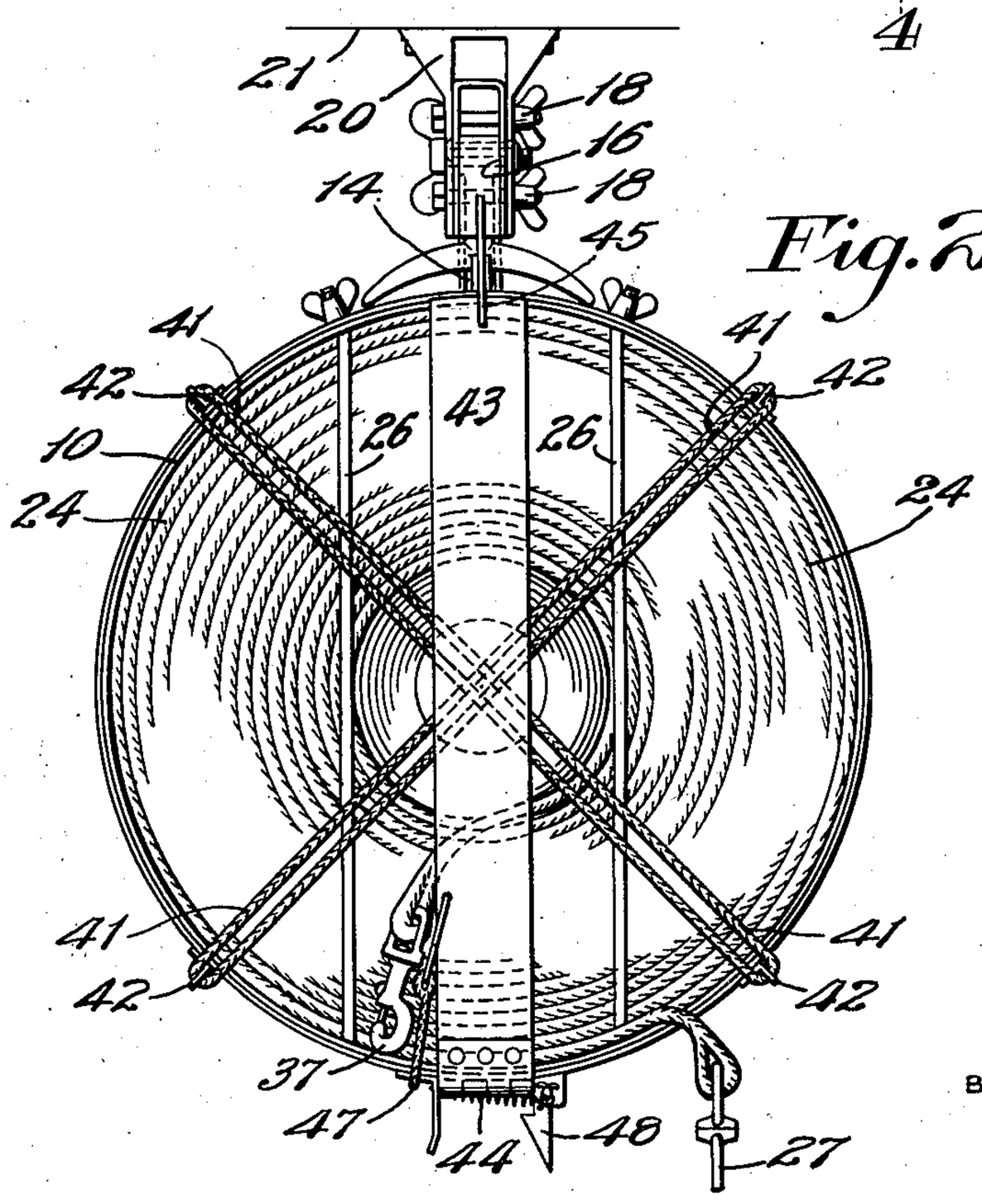


Fig. 2.



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TARGET TOWING DEVICE

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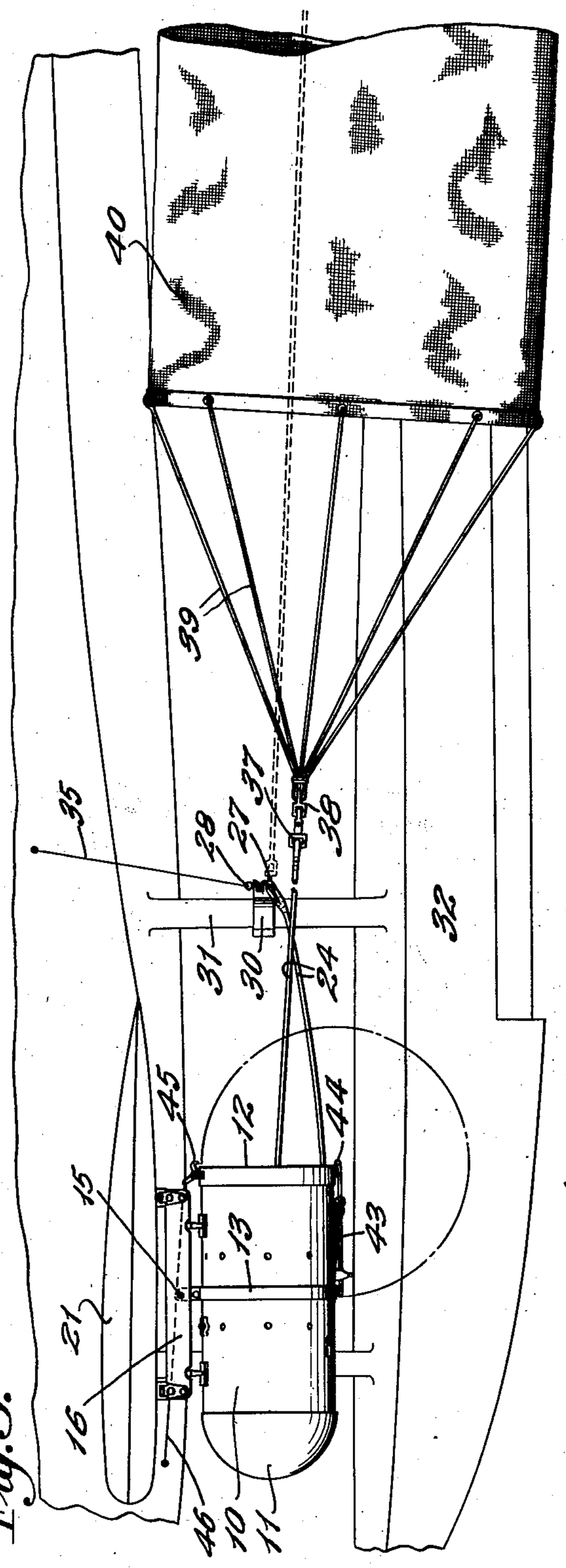

Fig. 3.

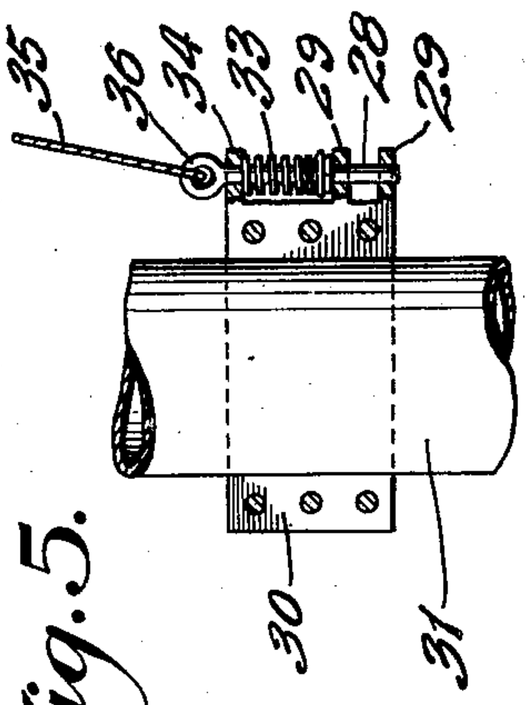

Fig. 5.

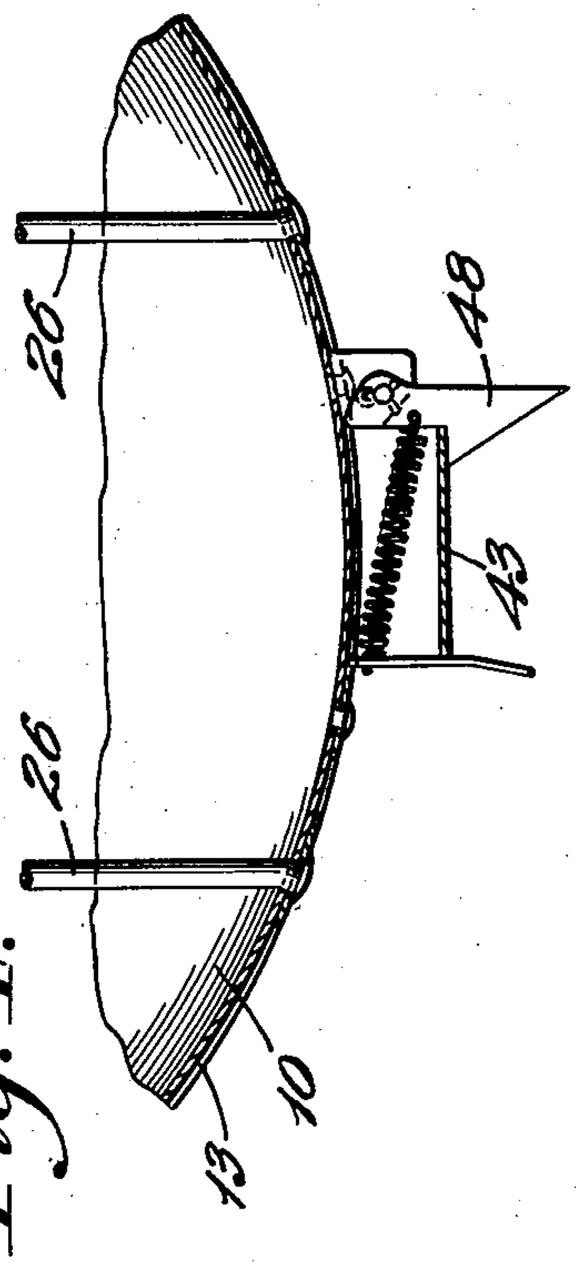

Fig. 4.

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TARGET TOWING DEVICE

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Application December 20, 1938, Serial No. 246,786

7 Claims. (Cl. 273—105.3)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

This invention relates to target towing devices and it has a particular relation to devices for towing targets by aircraft during anti-aircraft gunnery practice.

The principal object of this invention is the provision of a device of the character described which includes means for housing the target and its towing line in such manner that when the target is launched it will be positively expelled from its container and draw its tow line after it without the fouling or bunching of the latter, and which may be packed for launching with a minimum of time and labor.

With this and other objects in view, as well as other advantages that may be incident to the use of the improvements, the invention consists in the parts and combinations thereof hereinafter set forth and claimed, with the understanding that the several necessary elements constituting the same may be varied in proportion and arrangement without departing from the nature and scope of the invention, as defined in the appended claims.

In order to make the invention more clearly understood, there are shown in the accompanying drawings, means for carrying the invention into practical use, without limiting the improvements in their useful application to the particular construction, which, for the purpose of explanation, have been made the subject of illustration.

In the accompanying drawings:

Fig. 1 is a side elevational view with parts broken away of an aerial target towing device constructed in accordance with the invention;

Fig. 2 is a view of the after end of the structure shown in Fig. 1 with the target removed;

Fig. 3 is a side elevational view on a larger scale of the structure shown in Fig. 1 after the target has been launched;

Fig. 4 is an enlarged fragmentary sectional view taken on line 4—4 of Fig. 1; and

Fig. 5 is an enlarged detail view of the tow line releasing mechanism.

Referring to the drawings, the improved target towing device comprises a cylindrical container 10 having a rounded forward end 11 and an open after end 12. This container is provided with a circumferential band or strap 13 intermediate of its ends which is formed with ears 14 at its upper ends for attachment by means of a bolt 15 to the middle of a pair of parallel spaced supporting bars 16. These bars in the present instance form a part of a conventional bomb rack and are secured at their forward and rear ends by means of bolts 17 and 18 to brackets 19 and 20 respectively, fixed to the under surface of an airplane wing 21. The container 10 is prevented from turning movement by two arcuate steadying saddles 22 also fixed between the bars 16 by bolts 23. A coil of tow line 24 is fitted snugly with the forward portion of the container and is held against premature uncoiling or collapse by a wooden block 25 in the rounded end 11 of the container and a pair of spaced parallel rods 26 extending vertically through the container 10 and removably secured thereto. The end of the outer convolution of the line extends forwardly along the bottom of the container and out of its rear end and is provided with an eye 27 for engagement by a latch pin 28 which is slidably mounted in ears 29 forming a part of a bracket 30 fixed to a strut 31 of a pontoon 32 (Fig. 5).

The pin 28 is urged downwardly by a coil spring 33 interposed between the uppermost of the ears 29 and an ear 34 also formed on the bracket 30. The pin 28 may be retracted by the pilot when he desires to release the tow line and target, by means of a cable 35, the lower end of which is secured to an eye 36 on the pin 28 and which extends upwardly into the fuselage.

The end of the inner convolution of the tow line also extends rearwardly between the rods 26 and is provided with a detachable snap fitting 37 for engagement with a ring 38 on the bridle 39 of a target 40 which is carefully folded and snugly packed in the rear end of the container 10. The target 40, preferably of canvas and of cylindrical form when extended (Fig. 3), is urged outwardly of the container by a plurality of crossed elastic cords or bungees 41, the ends of which are looped over hooks 42 carried by the container 10. Before the target is inserted in the container these cords 41 extend transversely across the open end of the container 10, as shown in Fig. 2, but are stretched inwardly, as shown in Fig. 1 when the folded target is pushed into the container. Premature launching of the target is prevented by a gate 43, herein shown as comprising a strap or bar, which is hinged at 44 to the lower edge of the rear end of the container 10 and which is releasably engaged at its upper end by a latch hook 45 pivoted on the upper rear edge of the container and actuated by a cable 46 extending forwardly between the supporting bars 16 and up into the cockpit of the aircraft. In addition to the opening thrust of the target, the gate 43 is urged toward its full open position by an elastic cord 47 which is secured at its rear end to the gate and at its forward end to the underside of the container. When the latch hook 45 is actuated

to launch the parachute, the cord 47 swings the gate downwardly and forwardly to a horizontal position in which it is engaged by a spring latch 48 (Fig. 4). The target, when the gate is thus released, is expelled from the container by the elastic cords 41, the line 24 paying out freely between the rods 26 until the coil is completely unwound and the line and target are towed from the latch pin 28.

In order to prevent the several latches from being released by vibration or shock, they may be secured in position by twine which is breakable when the latches are intentionally actuated.

It will be understood that the above description and accompanying drawings comprehend only the general and preferred embodiment of the invention, and that various other changes in the construction, proportion and arrangement of the parts may be made by those skilled in the art without departing from the nature and scope of the invention as defined in the appended claims.

The invention described herein may be manufactured and/or used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

We claim:

1. Aircraft target towing device comprising a cylindrical container adapted to be secured horizontally to the under rigging of an aircraft and within the slipstream thereof, a coil of line disposed in the forward end of said container and having one end thereof fixed with respect to said aircraft, a flexible target folded into the rear end of said container and fixed to the other end of said line, means for releasably retaining said target in said container, and means for expelling said target rearwardly from said container when said retaining means is released.

2. Aircraft target towing device comprising a container adapted to be secured to the under rigging of an aircraft, a coil of line disposed in the forward end of said container and having one end of an outer convolution thereof fixed with respect to said aircraft, a flexible target folded into the rear end of said container and fixed to the end of an inner convolution of said line, and resilient means for expelling said target from said container.

3. Aircraft target towing device comprising a container adapted to be secured to the under rigging of an aircraft, a coil of line disposed in the forward end of said container and having one end thereof fixed with respect to said aircraft, a flexible target folded into the rear end of said container and fixed to the other end of said line, and a plurality of resilient cords extending along the sides of the folded target and across the forward end thereof for expelling said target from said container.

4. Aircraft target towing device comprising a container adapted to be secured to the under rigging of an aircraft, a coil of line disposed in the forward end of said container and having one end thereof fixed with respect to said aircraft, means extending across the rear end of said coil for supporting said coil against collapse, a flexible target folded into the rear end of said container and fixed to the other end of said line, resilient means for expelling said target from said container, retaining means for releasably holding said target in said container against the action of said expelling means, and latch means controllable by the pilot for releasing said retaining means to permit of the expulsion of said target and the unwinding of said coil of line, whereby said target may be towed by said aircraft at a predetermined distance therefrom.

5. Aircraft target towing device comprising a container adapted to be secured to the under rigging of an aircraft, a coil of line disposed in the forward end of said container and having one end thereof fixed with respect to said aircraft, a plurality of removable rods for supporting said coil against collapse, a flexible target folded into the rear end of said container and fixed to the other end of said line, resilient means for expelling said target from said container, retaining means for releasably holding said target in said container against the action of said expelling means, and latch means controllable by the pilot for releasing said retaining means to permit of the expulsion of said target and the unwinding of said coil of line, whereby said target may be towed by said aircraft at a predetermined distance therefrom.

6. Aircraft target towing device comprising a container open at its rear end and adapted to be secured to the under rigging of an aircraft, a coil of line disposed in the forward end of said container and having one end thereof fixed with respect to said aircraft, a flexible target folded into the rear end of said container and fixed to the other end of said line, elastic members releasably secured to the rear of said container and extensible into said container when the target is inserted therein for expelling said target from said container, a strap hinged to said container and extending across the open end thereof for releasably holding said target in said container against the action of said expelling means, and latch means controllable by the pilot for releasing said retaining means to permit of the expulsion of said target and the unwinding of said coil of line, whereby said target may be towed by said aircraft at a predetermined distance therefrom.

7. Aircraft target towing device comprising a container adapted to be secured to the under rigging of an aircraft, a coil of line disposed in the forward end of said container and having one end thereof releasably secured to said aircraft, a flexible target folded into the rear end of said container and fixed to the other end of said line, resilient means for expelling said target from said container, retaining means for releasably holding said target in said container against the action of said expelling means, and latch means controllable by the pilot for releasing said retaining means to permit of the expulsion of said target and the unwinding of said coil of line, whereby said target may be towed by said aircraft at a predetermined distance therefrom.

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