March 22, 1927. 1,622,140

R. M. GETCHELL

MOORING MASTHEAD

Filed April 18, 1922 4 Sheets-Sheet 1

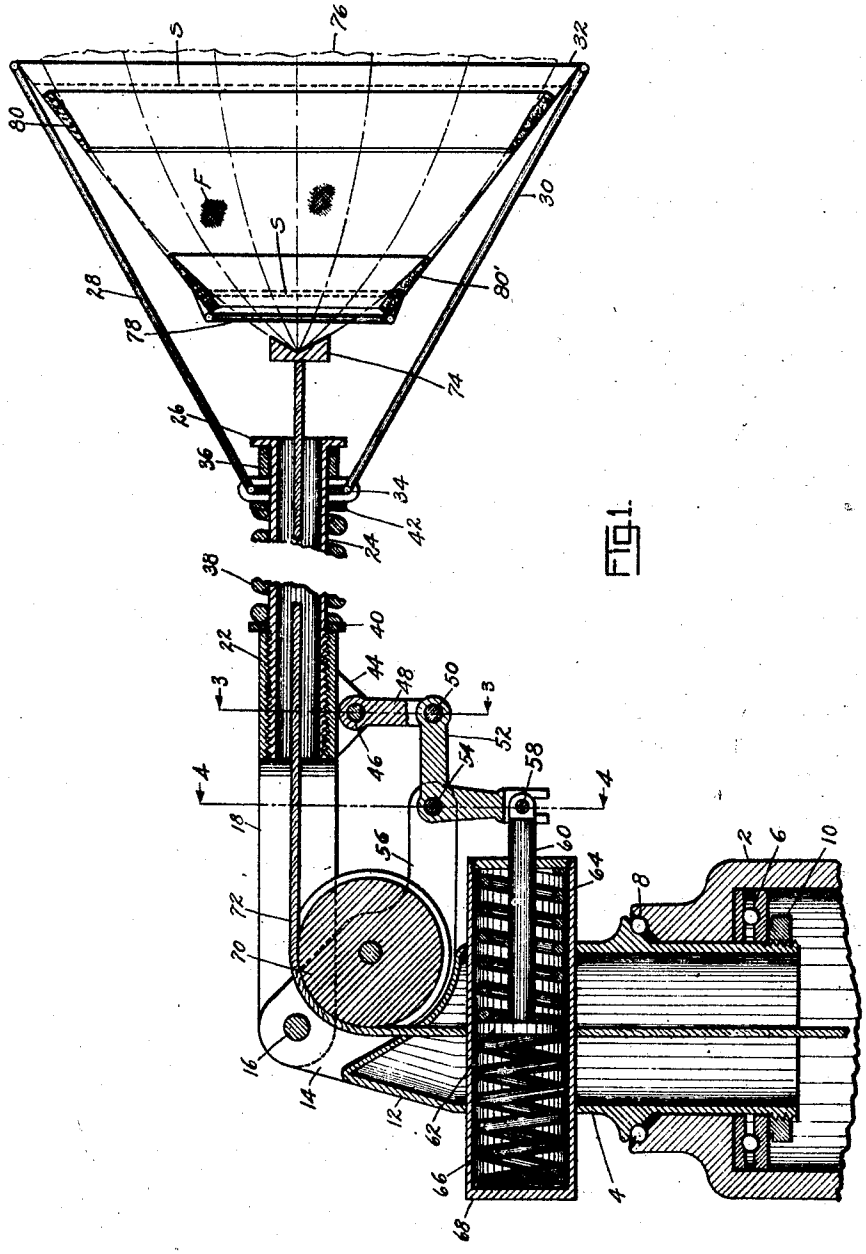


FIG 1.

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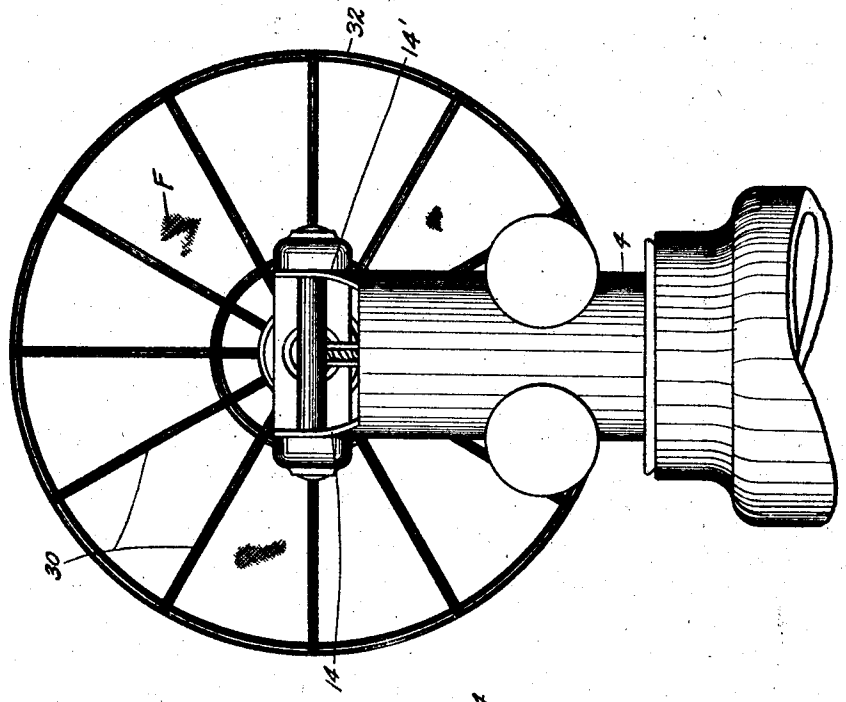


FIG. 2.

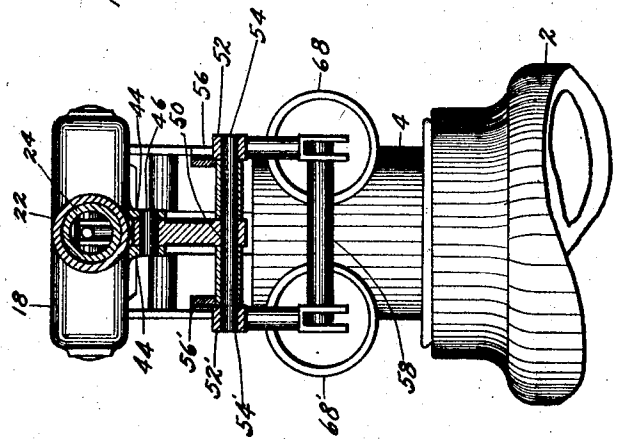


FIG. 3.

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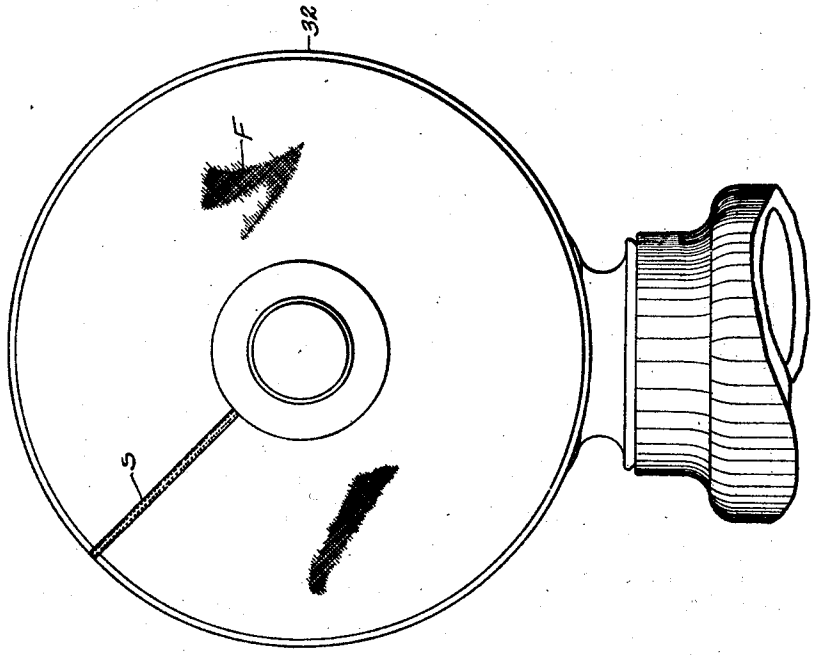


Fig. 5.

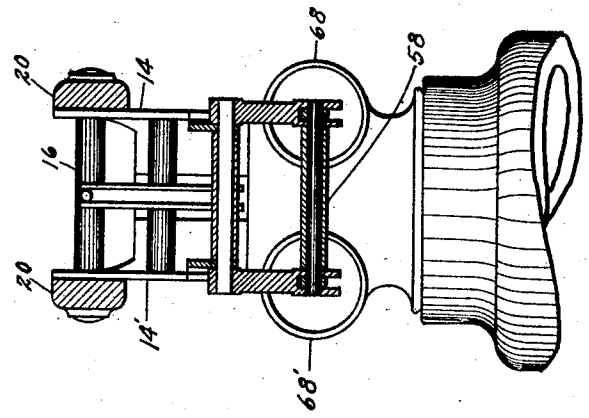


Fig. 4.

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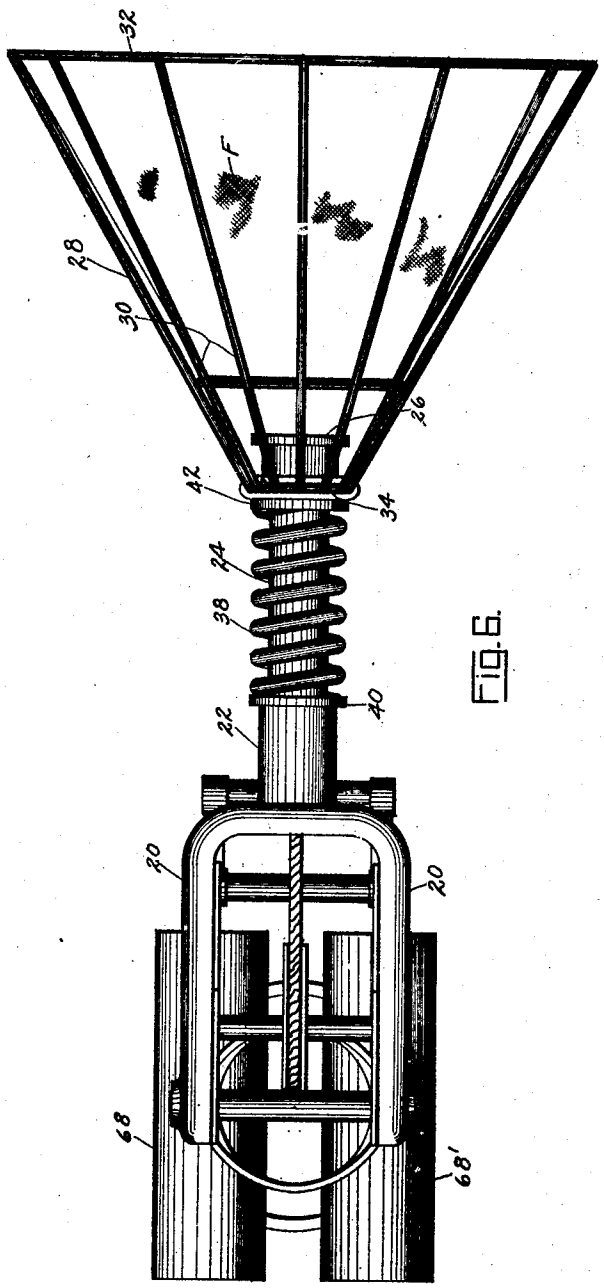


Fig. 6.

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Patented Mar. 22, 1927. 1,622,140

UNITED STATES PATENT OFFICE.

ROBERT M. GETCHELL, OF DAYTON, OHIO.

MOORING MASTHEAD.

Application filed April 18, 1922. Serial No. 555,343.

This invention relates to mooring masts for airships, and more particularly to a mooring head for a mooring mast.

In cases where a rigid, a semi-rigid or other lighter-than-air craft is to be moored outside of a hangar or balloon shed, it has been found necessary and expedient to provide a mast of considerable height as an anchoring means in order that the airship may be free for immediate use, etc. The nose of the airship is usually the portion to which the mooring means is attached and it is necessary that the ship be permitted to swing freely around the mast in a breeze or gale and yet be securely and resiliently secured to avoid possible injury. Further, due to weather conditions such as high gales, it is often impracticable to put the ship in its hangar or shed so it must be moored to a mast outside.

It is therefore an object of this invention to provide suitable means whereby the airship may be secured to such a mooring mast and preferably by its nose.

It is another object to provide means whereby the ship may be securely fastened to such mooring means and whereby the ship will be securely and resiliently fastened thereto so that it may sway up or down, parallel or at an angle to the ground longitudinally.

It is a further object to provide means whereby the ship may move either slightly away from the mooring mast or slightly toward it, depending on different conditions, without injury.

It is also an object to provide means whereby the ship may be moved around the mast in any radial direction either by the wind or hand while so secured.

It is also an object to so combine the above noted means that they may function simultaneously or independently.

It is a further object to provide a ship nose-engaging portion of the mooring mast head which will be non-injurious to the ship nose or fabric thereof.

It is another object of the invention to so arrange the mooring mast head that it may function in cooperation with a mooring means partly described and illustrated in my co-pending application, Serial No. 551,309, filed April 10, 1922.

Other objects will present themselves as the description of the drawing proceeds in which:

Figure 1 is a side elevation of the mooring mast head, partly in section;

Figure 2 is an end elevation thereof looking from the left in Figure 1;

Figure 3 is a sectional elevation on the line 3—3 of Figure 1 looking in the direction of the arrows;

Figure 4 is a sectional elevation on the line 4—4 in Figure 1 looking in the direction of the arrows;

Figure 5 is an end elevation of the arrangement shown in Figure 1 looking from the right; and

Figure 6 is a top plan view of Figure 1, parts being omitted.

Referring more particularly to the drawing, 2 designates the mooring mast proper on which is mounted the mast head, generally designated 4, in suitable anti-friction bearings 6, 8 to permit rotation of the head 4, and the head and mast are suitably secured together by means such as collar 10.

The head 4 is preferably of cast steel tapered in as at 12 (Figure 1) and flanged out flat as shown at 14, 14′ in order to provide bearing rests for the shaft 16 which is mounted therein and upon which shaft is pivotally mounted a yoke 18 having arms 20, 20 engaging opposite ends thereof. The hollow stem 22 of the yoke 18 is internally threaded to receive a similarly threaded rigid tube 24 which may be of proportionate length and carries at its outer end a circular flange 26 adapted to retain the bearing 36 of the airship nose engaging portion designated generally 28. This nose engaging portion 28 is cone shaped and may be composed of tubular rods 30 connected at their outer ends to ring 32 and at their inner ends connected to a ring 34 which is mounted on a suitable bearing 36 sliding on tube 24. A spring 38 is positioned between suitable abutment members 40, 42 the latter of which must be freely slidable on tube 24 and which may be rigidly attached to the ring 34 and bearing 36.

On the stem of the yoke 18 is cast a pair of spaced lugs 44 which are adapted to carry a pivot pin 46 upon which is mounted a pivot arm 48 and pivotally connected at 50 with bell crank levers 52, 52′ pivoted at 54, 54′ on a part 56 of the mast head 4. The crank arms are arranged to move simultaneously and in conjunction with one another. The lower ends of the crank arms 52, 52′ are forked as shown in Figures 1, 3 and 4 to engage the ends of a rod 58 connecting piston

rods 60, (only one of which is shown) connected in turn to piston heads 62, positioned between opposing springs 64, 66 and confined within cylinders 68, 68′, which are positioned on opposite sides of the mast head 4 and which may be cast in or otherwise secured thereto.

Mounted between flanges 14, 14′ is a sheave 70 over which passes the cable 72 passing through the hollow yoke stem and at one end connected to the airship 76 by a bridle shown generally at 74, while at the other end it may be connected to a shock-absorbing winding drum (not shown) such as that shown in my co-pending application referred to above.

The nose-engaging portion 28 is lined with a loose fabric F as shown, having a positioning ring 78. The fabric F may be secured at seams S and should be of flexible yet strong material, but as the kind or quality of the material does not fall within the scope of this invention, it is not deemed necessary to further describe it. The ring 78 may be loose, as shown, or may be resiliently secured by rubber cords (not shown) to the nose-engaging portion 28. Further, in order to provide adequate protection to the fabric of the nose of the ship, annular pads 80, 80′ may be attached to the fabric lining where their utility will be obvious.

It will be seen that the fabric lining F has utility as a wind direction positioning means for the mast head in addition to its function as a protecting means, for it will ever tend to turn "down wind" and as the ship is usually brought into its moorings "up wind" it follows that the nose-engaging portion 28 will be in a position to receive the ship.

In operation, the bridle of the airship may be attached to the cable 72 in any suitable manner and the nose will be brought into the position 28 by the winding mechanism to which the opposite end of the cable is attached. The nose will be protected by the fabric and cushion. Should the cable winding or reeling mechanism tend to pull the ship too tightly into the nose-engaging portion 28, the fabric and buffers will give slightly in compensation, but if the pull be stronger the spring 38 will compress, thereby resiliently taking up the pressure and practically eliminating all strain on the airship nose. Should there be a downward pressure on the airship the levers 48 and 52, in conjunction with the springs 64, 66 operate to resiliently relieve the shock. Further, the bearings 6, 8, permit the head to rotate to any radial position.

The springs 64, 66 may be replaced by suitable hydraulic, oil, or air operating means.

While I have shown and described my invention as applied in a particular manner, it is to be understood that various changes may be made without departing from the spirit of my invention.

What I claim and desire to secure by Letters Patent is:—

1. In a device of the character described, a stationary means, means rotatable therein, a yoke pivotally mounted on and embracing said rotatable means, resilient means mounted on the stem of said yoke and means between said yoke and rotatable means resisting movement of said yoke from a predetermined position.

2. In a mooring means of the character described, a hollow stationary means, a head rotatable in conjunction therewith adapted to have a cable pass therethrough and provided with spaced arms, a sheave mounted between said spaced arms, a yoke mounted on said head and having a hollow stem adapted to have the cable pass therethrough, means mounted upon said last mentioned means for containing the portion of an airship to be moored thereto and means operable therewith for limiting inward movement of said airship engaging portion and means between said airship engaging portion and said stationary means whereby upward forces beyond the normal on said yoke means will be resiliently limited.

In testimony whereof I affix my signature.

ROBERT M. GETCHELL.