J. MEANS.

APPARATUS FOR LAUNCHING FLYING MACHINES.

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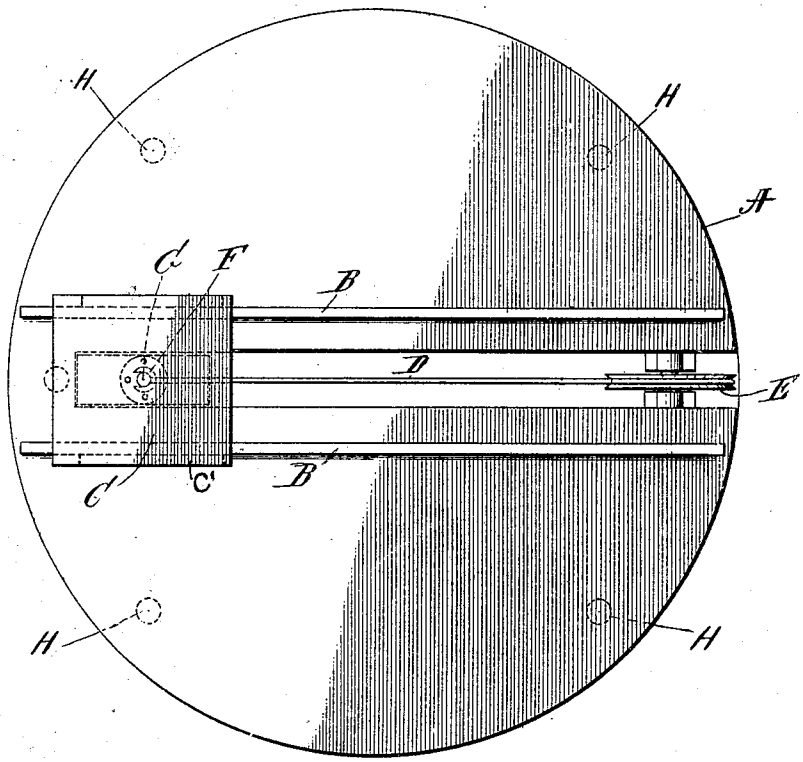


Fig. 1.

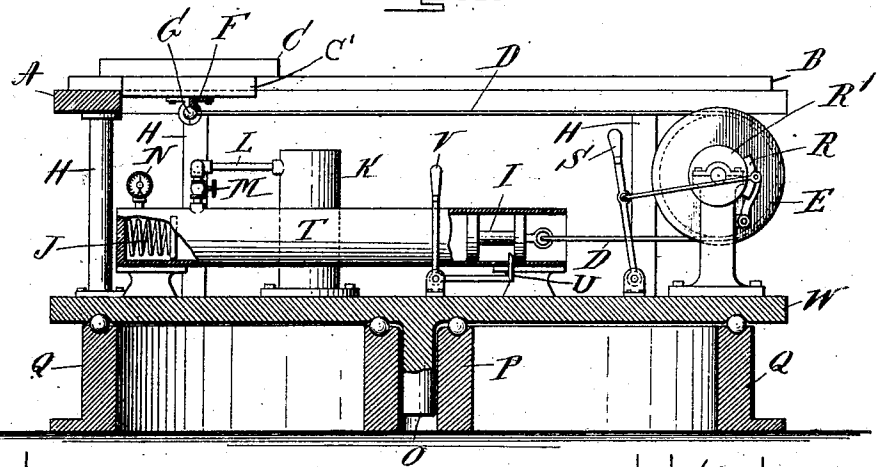


Fig. 2.

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APPARATUS FOR LAUNCHING FLYING-MACHINES.

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To all whom it may concern:

Be it known that I, JAMES MEANS, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Apparatus for Launching Flying-Machines, of which the following is a specification.

My invention relates to apparatus for launching flying machines.

In a flying machine of the aeroplane type a certain high initial velocity in the direction opposite to that of the wind is desirable for soaring, and this velocity which varies according to conditions is best imparted to the machine by means extraneous thereto, so that the weight of the machine may be a minimum.

The object of my invention is to provide a simple and efficient apparatus for launching flying machines whereby any desired initial velocity may be imparted to the machine to be launched in a direction toward any point of the compass.

With this object in view my invention consists in a table, preferably rotatable, and fluid-pressure-controlled means whereby the desired initial velocity may be imparted either directly to the flying machine or to a truck or other device carrying the same. The particular fluid - pressure - controlled mechanism which I prefer to employ consists in a cylinder provided with means for evacuating the same to any desired degree, and a piston adapted to be acted upon by atmospheric pressure against the vacuum created in the cylinder; but it will be understood that I do not limit myself specifically to the fluid-pressure-controlled mechanism hereinafter described, inasmuch as other fluid-pressure-controlled mechanisms may be employed, such for example as one operated by gas under high pressure.

In the drawings which accompany and form a part of this specification Figure 1 is a plan view and Fig. 2 is a central section of one embodiment of my invention.

In that embodiment of my invention selected for illustration and shown in the accompanying drawings, A represents a table of suitable dimensions supported by the columns H on the base W, which in turn may be supported by ball-bearings or other suitable friction-reducing devices on the standard Q. The axle O which is rigidly secured to or integral with the base W is inclosed within the journal P so that said base with its super-imposed table may with minimum effort be rotated about the center of said journal.

The table is provided with suitable guideways B which may be single or double rails, tracks or grooves upon which the device C may be supported and by which said device may be guided. As shown, the members B are guide bars and the device C which may be a truck or sled carrying a flying machine, or which may be the flying machine itself, is prevented from leaving the guideways B when the truck is in motion by overhanging edges C'. It will be understood, however, that any suitable means may be employed for maintaining the truck C on the guideways B. The table may be provided with a centrally arranged slot disposed above the cable D which passes around the grooved pulley E and which may be driven at a high velocity by the fluid-pressure-controlled mechanism hereinafter described. The rearward end of said cable is provided with suitable self-detaching device for temporarily connecting said cable with the truck C. As shown, this device consists in a socket F secured to the under side of the truck and open on one side so that the ball G on the end of the cable may be retained within the socket so long as the cable exerts a forward pull on the same. However, as soon as the sled reaches a point near the end of the guideways B, the pull of the cable is downward and the ball will drop out of the socket thereby disengaging the cable from the device C. This device, if it be the flying machine to be launched, will enter upon free flight and if it be a truck carrying said machine it will merely fall to the ground in front of the launching device.

Arranged beneath the table A and preferably supported by the base W is a cylinder T of suitable length carrying a piston I, which preferably is a double piston as shown and provided at its inner end with the spring buffer or other suitable cushioning device J and with a pressure gage N. Any suitable air pump K which may be supported by the base W is connected with the cylinder T by the pipe L provided with the valve M. It will be understood, however, that the cylinder T may be evacuated by any suitable mechanism extraneous to the launching device.

R is a brake coöperating with the drum

R′ of the pulley E and actuated in any suitable manner, as by the lever S. The trip U operated by the bell-crank lever V may be employed as shown for restraining the rearward movement of the piston I while the cylinder is being evacuated.

The operation is as follows: The sled or flying machine C is placed in the position shown in the drawings at or near one end of the guideways B, and is connected with the cable D by the ball and socket joint GF. The trip U is adjusted to prevent any rearward movement of the piston. The air pump K is put in operation to exhaust the cylinder T to the desired degree as indicated by the gage N. The turntable is, or previously has been, oriented so that the guideways have a position parallel to the direction desired in flight. The brake R is then strongly applied and the piston I released by a movement of the lever V throwing the trip U out of the cylinder, whereupon the pressure of the atmosphere upon the piston forces the same through the cylinder to the buffer J, its velocity and consequently that of the device C being regulated by the brake R. In this manner, the initial velocity desired for launching the flying machine is imparted thereto in the desired direction, and at a point near the forward end of the guideways the cable is automatically released from said machine thereby allowing the same to enter upon free flight.

One of the advantages of my invention lies in its suitability to those military operations where portability must be considered, this portability in part arising from the fact that the cylinder T when evacuated is a reservoir of energy in which the cumulative effect of a comparatively small motor-actuated air pump may be stored between launchings.

It will be obvious that between the piston and the device C any suitable multiplying device may be used in case it should be found desirable to increase the area of the piston and diminish the length of its stroke.

It will be understood that many modifications may be made in the apparatus shown in the drawings and hereinbefore described without departing from the spirit of my invention.

I claim:

1. In an apparatus for launching flying machines, the combination, with a table, of fluid-pressure-controlled mechanism for imparting forward motion to the machine to be launched.

2. In an apparatus for launching flying machines, the combination, with a table, of fluid-pressure-controlled mechanism for imparting a variable initial velocity to the machine to be launched.

3. In an apparatus for launching flying machines, the combination, with a revoluble table, of fluid-pressure-controlled mechanism for imparting forward motion to the machine to be launched.

4. In an apparatus for launching flying machines, the combination, with a revoluble table, of fluid-pressure-controlled mechanism for imparting a variable initial velocity to the machine to be launched.

5. In an apparatus for launching flying machines, the combination, with a table, of a cylinder containing a piston, means for evacuating said cylinder and means operatively connecting said piston with the machine to be launched.

6. In an apparatus for launching flying machines, the combination, with a revoluble table, of a cylinder containing a piston, means for evacuating said cylinder and means operatively connecting said piston with the machine to be launched.

7. In an apparatus for launching flying machines, the combination, with a table, of a cylinder containing a piston, means for evacuating said cylinder and self-detaching means operatively connecting said piston with the machine to be launched.

8. In an apparatus for launching flying machines, the combination, with a table, of a cylinder containing a piston, means for evacuating said cylinder, and a cable connecting said piston with the machine to be launched.

9. In an apparatus for launching flying machines, the combination, with a table, of a cylinder containing a piston, means for evacuating the cylinder, a cable connecting said piston with the machine to be launched, and means for automatically detaching said cable from said machine at a point near the forward end of said table.

10. In an apparatus for launching flying machines, the combination, with a table, of a cylinder containing a piston, means for evacuating the cylinder, means for restraining said piston during the evacuation of said cylinder and means operatively connecting said piston with the machine to be launched.

11. In an apparatus for launching flying machines, the combination, with a table, of a cylinder containing a piston, means for evacuating the cylinder, means operatively connecting said piston with the machine to be launched and means for regulating the velocity of said piston during the launching operation.

12. In an apparatus for launching flying machines, the combination, with a table, of guideways thereon constructed to support the machine to be launched, a cylinder containing a piston, means for evacuating said cylinder and means operatively connecting said piston with the machine to be launched, whereby the latter may be propelled along said guideways.

13. In an apparatus for launching flying machines, the combination, with a table, of fluid-pressure-controlled mechanism extra-

neous to the machine to be launched for imparting forward motion thereto.

14. In an apparatus for launching flying machines, the combination, with a revoluble table, of fluid-pressure-controlled mechanism extraneous to the machine to be launched for imparting forward motion thereto.

In testimony whereof, I have hereunto subscribed my name this 24th day of Aug. 1908.

JAMES MEANS.

Witnesses:
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GEO. K. WOODWORTH.