J. N. LEWIS.

CAPTIVE BALLOON CONTROLLER AND CONVEYER.

APPLICATION FILED NOV. 3, 1917.

1,275,710.

Patented Aug. 13, 1918.

3 SHEETS—SHEET 1.

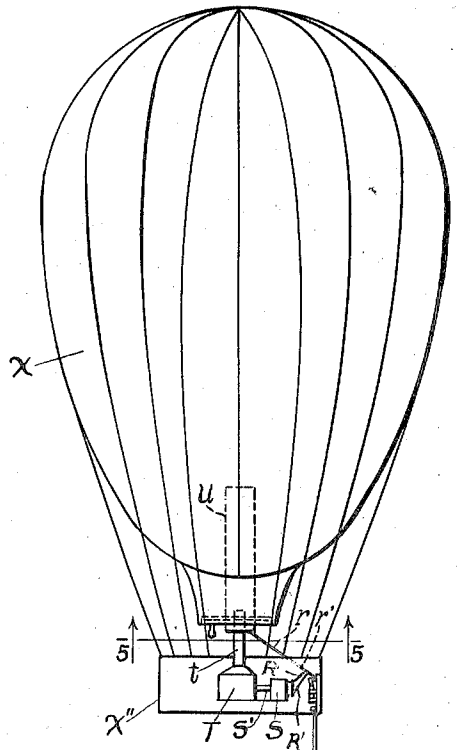


Fig. 1.

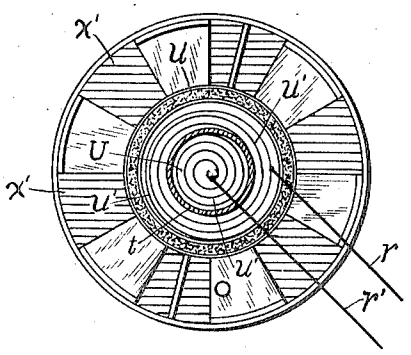
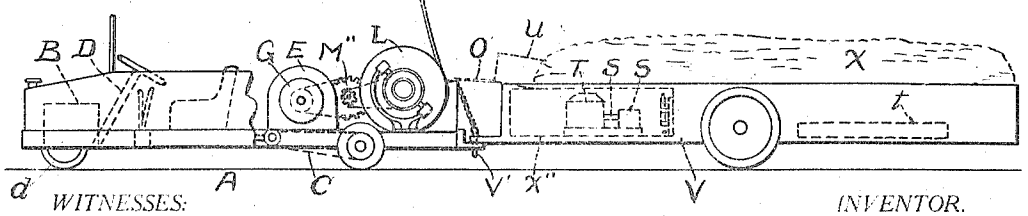


Fig. 5.



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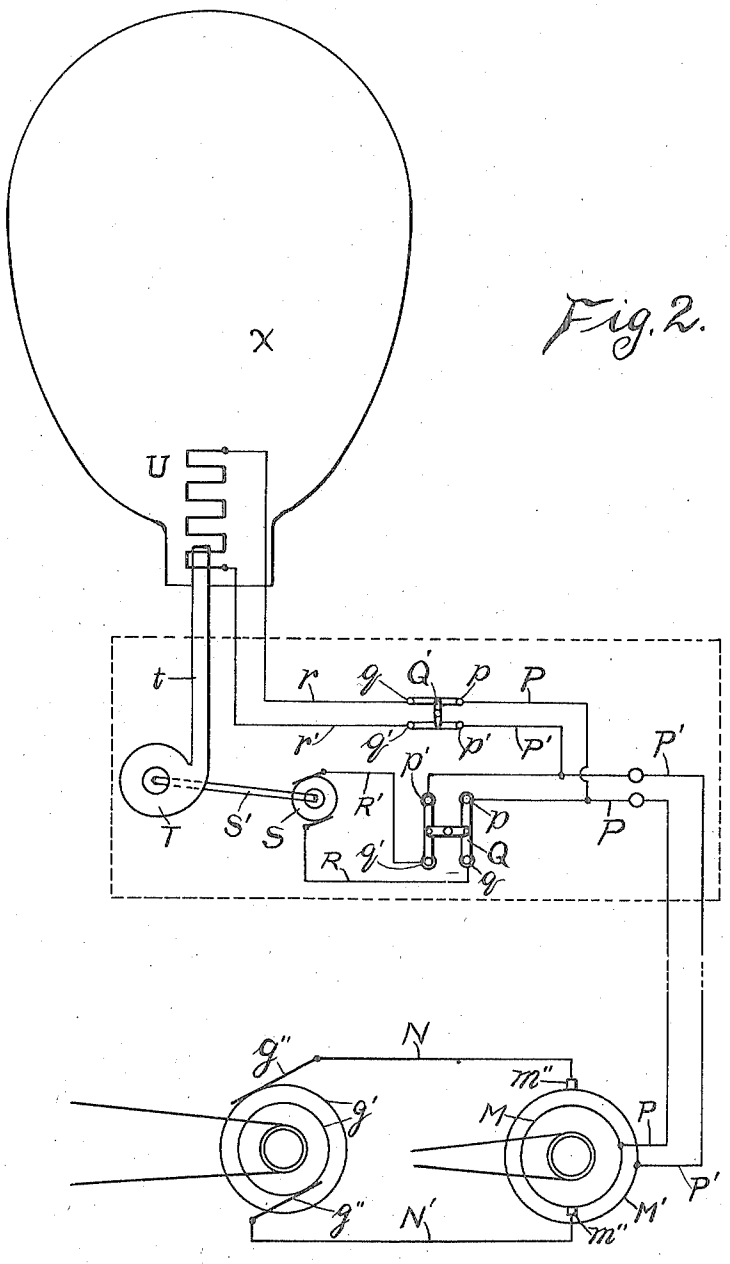


Fig. 2.

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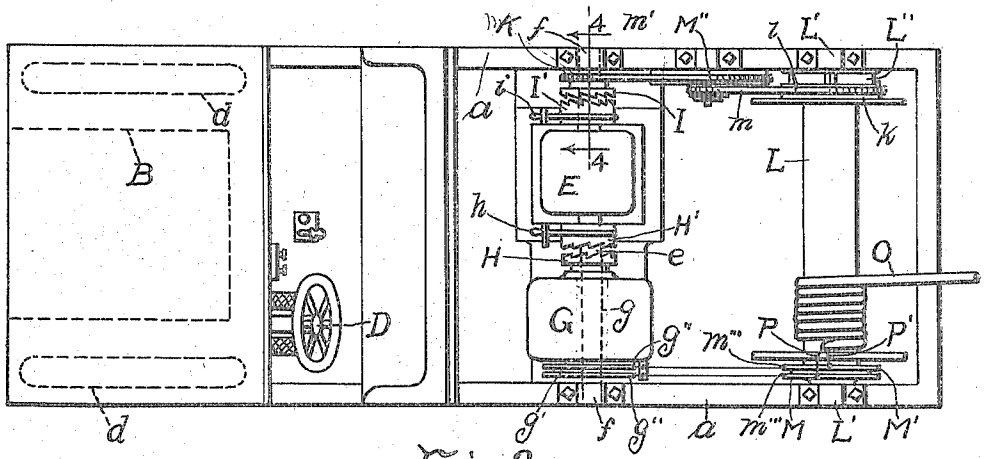


Fig. 3.

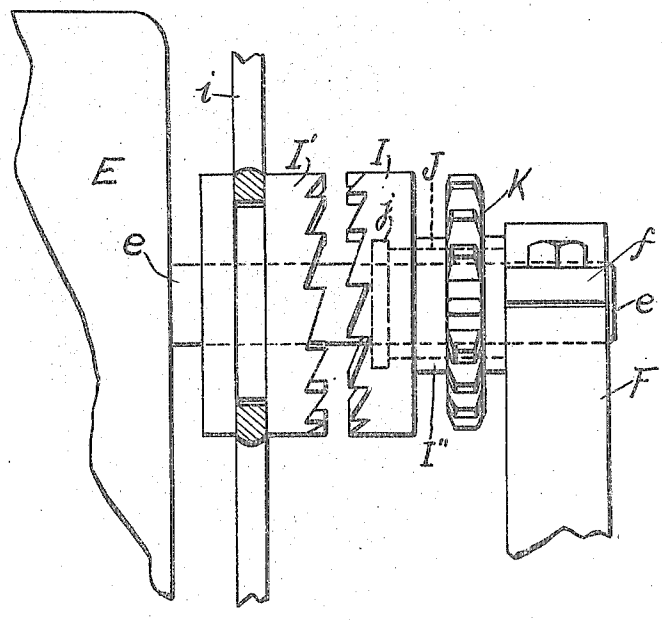


Fig. 4.

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CAPTIVE-BALLOON CONTROLLER AND CONVEYER.

1,275,710. Specification of Letters Patent. Patented Aug. 13, 1918.

Application filed November 3, 1917. Serial No. 200,048.

To all whom it may concern:

Be it known that I, JAMES N. LEWIS, a citizen of the United States, and a resident of Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Captive-Balloon Controllers and Conveyers, of which the following, when taken in connection with the drawings accompanying and forming a part hereof, is a specification.

This invention relates to devices which ascend and float in the air by levitation.

And the objects of the invention are, to obtain means to convey a captive balloon, of the kind which are adapted to rise from the ground when inflated with hot air, to a predetermined place or position prior to the inflation thereof; to obtain means to inflate said balloon when desired; to obtain means to maintain the inflation of said balloon for any desired period of time; to obtain means to vary the inflation of the balloon while the same is suspended in the air, and to obtain means to drag or draw said balloon in a desired direction while so suspended.

Additional objects are to obtain, in a captive balloon which is adapted to carry up therewith one or more persons, means, operable by said person or persons, for controlling the height or elevation at which said balloon shall be suspended and means by which electrically operable signals may be received and transmitted by said persons.

Further objects are to obtain mechanisms for accomplishing the above purposes which are economical in material and construction, durable and not liable to break or be put out of order.

Additional objects are disclosed in the specification and claims.

In the drawings accompanying and forming a part hereof,

Figure 1 is an elevation of a captive balloon and a construction embodying this invention.

Fig. 2 is a diagram of electric circuits and members of said circuits forming elements of the construction which is illustrated in Fig. 1.

Fig. 3 is a top plan view of a truck body and the members mounted thereon which form a part of the construction embodying this invention.

Fig. 4 is a side elevation, on an enlarged scale, of a journal bearing, clutch members, and a shaft one end whereof is rotatably mounted in said bearing, all being elements of the truck mounted construction.

And Fig. 5 is a view, looking up, on line 5—5 of Fig. 1, as indicated by the arrows.

A reference character applied to designate a given part indicates said part throughout the several figures of the drawing wherever the same appears.

A represents a truck which is provided with an internal combustion engine, B; driving gear, comprising side chains C, steering post D and the ordinary connections between said post and wheels *d*. E (Fig. 3), represents an internal combustion engine which is mounted on the chassis *a*, of truck A, by means of standards F; in the journal bearings (*f*), of which, the crank shaft *e* is rotatably mounted. G represents a dynamo, the armature of which is represented as built onto the tube *g*; (indicated by broken lines in Fig. 3), said tube being loosely mounted on shaft *e*, and provided with clutch member H, which is rigidly secured thereto. H′ and I′ respectively represent a clutch member which is mounted on shaft *e* to turn therewith and movable on said shaft. Member H′ is movable into and out of engagement with clutch member H, and I′ is movable into and out of engagement with clutch member I. *h* represents a lever arranged to control the position of clutch member H′, and *i* a lever arranged to control the position of clutch member I′. Clutch member I is provided with a hub, I″, which is loosely mounted on the cylindrical extension J of journal bearing *f*; said extension being indicated by broken lines in Fig. 4; and broken lines *j* in said Fig. 4 indicate a collar on said extension which holds said hub in place thereon. K represents a sprocket wheel which is secured on hub I″ to turn therewith. L represents a cable drum or spool which is provided with a shaft rotatably mounted in journal bearings L′ L′. L″ represents a brake; *l*, a sprocket wheel, and M, M′, commutator rings. The drum of brake L″, sprocket wheel *l*, and rings M, M′ are rigidly secured to turn with said drum or spool L.

When clutch members I, I′ are engaged the drum or spool L is driven by the rotation of crank shaft *e*; and M″ is a reducing sprocket wheel with which sprocket chains *m*, *m′* engage to drive said drum at

a lower speed than that of crank shaft *e*. N, N′, represent electric conductors which are attached to the brushes *g″* of the commutator *g′* of dynamo G, and to the brushes *m″* of rings M, M′. O represents a cable which is provided with the insulated conductors P, P′, (built thereinto) and said conductors are attached to the commutator rings M, M′, respectively.

X represents a hot air balloon construction which is provided with a bag open at the lower end thereof (as viewed in Figs. 1 and 2), and X′ (Fig. 5), represents a damper by means of which said opening may be restricted, but not closed. X″ represents the basket or car of the balloon construction X.

One end of the cable O is attached to drum or spool L and the other end is attached to basket or car X″.

The electric conductors P, P′, extend beyond the end of the cable O which is attached to basket or car X″ and are, respectively, in electric connection with terminals *p*, *p′*, of switches Q, Q′. From the terminals *q*, *q′* of switch Q conductors R, R′ extend to the motor S, and T, represents a motor driven fan the blades whereof are mounted on the common shaft S′ of said dynamo S and fan T. *t*, is a discharge conduit from fan T and is adapted to convey air from said fan into the bag of balloon construction X. U is a heater which is positioned so that the air which is discharged from the conduit *t* is heated thereby before it is delivered into the balloon bag (or bags). The heater U is in electric connection with the terminals *q* and *q′* of the switch Q′ by means of conductors *r*, *r′*. The heater U comprises a shell *u* which is open at both ends and is constructed of non-heat conducting material, as asbestos, mineral wool, or the like. In Fig. 5 the heating coil of heater U is indicated by the spiral resistance coil *u′*.

V, Fig. 1, illustrates a trailer which is attached to truck A, as by coupling pin V′. The trailer V is adapted to have the bag of ballon X and basket or car X″ mounted thereon when said balloon bag is not inflated, and in Fig. 1 a balloon including the bag and basket thereof, is indicated by broken lines as mounted thereon.

The operation of the several constructions described is as follows:

The truck A, with trailer V attached, having been driven to a given place, with the balloon on said trailer, and the engine E operating, (said engine being coupled to dynamo G), the motor S and heater U are switched into the electric circuit which comprises commutator *g′* of dynamo G, brushes *g″*, conductors N, N′, brushes *m″*, commutator rings M, M′, conductors P, P′, and switches Q, Q′, where the current is divided, a part traveling on the terminals of switch Q the conductors R, R′, and the brushes and coils of motor S, and a part on the terminals of switch Q′, conductors *r*, *r′*, and the coils *u′* of heater U.

Fan T is thereby actuated and heater U energized. Heated air is forced into the gas bag (or bags) and the balloon thereby inflated, to rise by levitation. Application of the brake L″ controls the speed of the ascent of the balloon.

When the balloon has reached a desired altitude the brake L″ is applied with sufficient force to arrest rotation of drum L; and when the balloon is to be lowered or brought down the clutch members I, I′ are forced into engagement to couple engine E to drum L by way of sprocket members M″, *l*, chains *m* and *m′* and sprocket wheels K, *k*.

I claim:—

1. A lighter than air construction comprising means to contain heated air, said means open at the lower end thereof, a heater, means, comprising a fan, arranged to discharge air therefrom on to said heater and into said open end, said heater and fan respectively adapted to be energized by an electric current, a source of electrical supply and electric conductors connecting said source of supply and said heater and fan.

2. A lighter than air construction comprising means to contain heated air, said means open at the lower end thereof, a cylindrical shell of non-heat conducting material, open at its ends extending upward from the open lower end of and into said heated air container, a heater, positioned in said shell, means, comprising a fan, arranged to discharge air into said shell and on to said heater, said heater and fan respectively adapted to be energized by an electric current, a source of electrical supply and electric conductors connecting said source of supply and said heater and fan.

3. A lighter than air construction comprising a bag, open at the lower end thereof, a heater adapted to be energized by an electric current and arranged to discharge air therefrom into said open end, and a cable comprising insulated electric conductors connected to said heater, in combination with means positioned on a heavier than air construction to store said cable, means to control the stored length of said cable, means to generate an electric current, and means to connect said generator to said insulated conductors to convey the current generated by said generator to said heater.

4. A lighter than air construction comprising a bag open at the lower end thereof, a heater adapted to be energized by an electric current and arranged to discharge air therefrom into said open end, a cable comprising insulated electric conductors connected to said heater, and means positioned

between said cable and said heater to break the continuity of said conductors, in combination with means positioned on a heavier than air construction to store said cable, means to control the stored length of said cable, means to generate an electric current and means comprising commutator rings and brushes, to connect said generator to said insulated conductors to convey the current generated by said generator to said heater.

5. A lighter than air construction comprising a bag, open at the lower end thereof, a heater, means, comprising a fan, arranged to discharge air therefrom on to said heater and into said open end, said heater and fan respectively adapted to be energized by an electric current and a cable comprising insulated electric conductors connected to said heater and fan, in combination with means positioned on a heavier than air construction to store said cable, means to control the stored length of said cable, means to generate an electric current, and means to connect said generator to said insulated conductors to convey the current generated by said generator to said heater and fan.

6. A lighter than air construction comprising a bag open at the lower end thereof, a heater adapted to be energized by an electric current and arranged to discharge air therefrom into said open end, a cable comprising insulated electric conductors connected to said heater, and means positioned between said cable and said heater to break the continuity of said conductors in combination with means comprising a drum, positioned on a heavier than air construction, to store said cable, means, comprising a brake to said drum, to control the stored length of said cable, a dynamo, means to rotate said drum and to actuate said dynamo, and means comprising commutator rings and brushes, to connect said dynamo to said insulated conductors to convey the current generated thereby to said heater.

7. A lighter than air construction comprising a bag, open at the lower end thereof, a heater, means, comprising a fan, arranged to discharge air therefrom on to said heater and into said open end, said heater and fan respectively adapted to be energized by an electric current, and a cable comprising insulated electric conductors connected to said heater and fan, in combination with means on a heavier than air construction to store said cable and said lighter than air construction, means to control the stored length of said cable, means to generate an electric current, means to connect said generator to said insulated conductors to convey the current generated by said generator to said heater and fan, and means, comprising a motor, to propel said heavier than air construction to convey the several recited means mounted thereon to pre-determined locations.

8. A lighter than air construction comprising means to contain heated air, said means open at the lower end thereof, a heater, means, comprising a fan, arranged to discharge air therefrom on to said heater and into said open end, said heater and fan respectively adapted to be energized by an electric current, a cable comprising insulated electric conductors connected to said heater and fan, and means to break said connections, respectively, in combination with means on a heavier than air construction to store said cable and said lighter than air construction, means comprising a brake, clutch members, and a motor, to control the stored length of said cable, a source of supply of an electric current, and conductors arranged to convey said current to said insulated conductors, said heavier than air construction adapted to convey the several recited means mounted thereon to pre-determined locations.

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In the presence of—
OWEN H. FAY,
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