

No. 817,381.

PATENTED APR. 10, 1906.

C. I. MATSON.
AMUSEMENT APPARATUS.
APPLICATION FILED SEPT. 8, 1905.

Fig. 1.

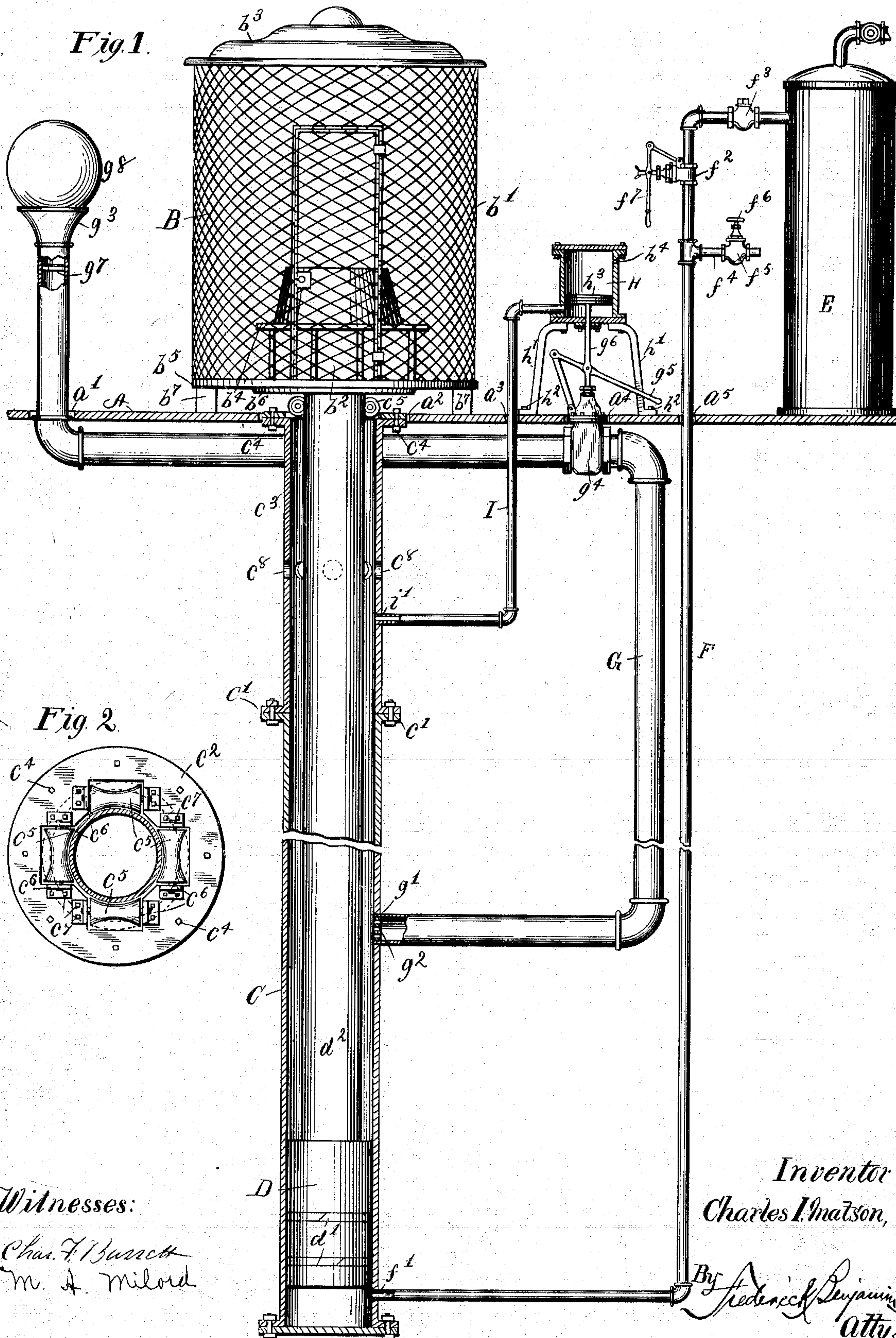


Fig. 2.

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AMUSEMENT APPARATUS.

No. 817,381.

Specification of Letters Patent.

Patented April 10, 1906.

Application filed September 8, 1905. Serial No. 277,571.

To all whom it may concern:

Be it known that I, CHARLES I. MATSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Amusement Apparatus, of which the following is a specification.

My invention relates to amusement devices, and especially to that class designed to interest or amuse by producing new, unusual, or peculiar sensations, and I accomplish these objects by causing a car adapted to carry a number of persons to rise or descend at varying rates of speed or to fall suddenly from a considerable height.

The apparatus consists in general of an inclosed car for the passengers, which is mounted upon the top of a piston-rod, the head at the lower end of which fits snugly within a vertical cylinder, a storage-tank for compressed air, tubes connecting the various parts, the necessary valves, both manual and automatic, for controlling the air-supply and motive power, a signaling device, and means for preventing accidents to the apparatus or passengers.

In the accompanying drawings, which form a part of this application, Figure 1 is a view, partly in elevation and partly in section, of my improved amusement apparatus. Fig. 2 is a plan view of the upper end of the cylinder and piston-rod.

A platform or floor A, located, preferably, at the surface of the ground, forms a foundation for various portions of the operative mechanism and has openings a' a^2 a^3 a^4 a^5 for the passage of different sections of the apparatus. A passenger-car B, circular in form, of sufficient capacity to accommodate a number of persons is inclosed in a heavy wire network b' , forming the walls, in which is fitted and hinged a door b^2 to afford access to the interior of the car. The car is provided with a roof b^3 , with a circular seat b^4 arranged in the center of the car and with a floor b^5 , which is reinforced on the under side by a plate b^6 , which forms a support for the car.

A cylinder C, formed of sections, is sunk approximately its full length in the earth, so that the upper end projects into or registers with the opening a^2 in the floor A. The said sections are firmly bolted together by means of flanges c' , the inner walls of the sections coinciding, so as to give a smooth and uniform bore for the reciprocation of a piston-head D, which fits the said cylinder and has

packing-rings d' to form an air-tight joint between the piston and cylinder C. To the upper end of said piston-head is secured a strong vertical rod d^2 , which extends the length of the cylinder and projects a slight distance above the floor A when the piston is at the lower end of the cylinder and is secured to the foundation-plate b^6 of the car. Since the car and the piston-rod d^2 are both secured to plate b^6 , it will be readily seen that if the piston is moved vertically in its cylinder the car will move in unison with it. The motor-power which I use for the operation of the piston is compressed air, although my apparatus is adapted for other fluids or gases, and such may be used for the purpose, and hence I do not wish to be limited to any particular motive fluid.

I provide a storage-tank E for the compressed air, which may be obtained from any source desirable. From said tank air under pressure is conveyed by a pipe F to the interior of the cylinder C, entering same near its lower end below the piston by means of an opening f' . The pipe F is furnished with a manually-operated quick-opening gate-valve f^2 and with a check-valve f^3 , and a branch f^4 is furnished with an escape-valve f^5 , operated by a hand-wheel f^6 . A vent-pipe G of comparatively large caliber is connected to the cylinder C at a point g' some distance above the lower end of the cylinder, the opening being fitted with a grating g^2 in order to avoid interference with the packing-rings d' in the passage of the piston D to and fro. The said vent-pipe G leads to the surface of the earth at any convenient locality, where it is continued upward to some distance above the ground-level, terminating in a bell-shaped mouthpiece g^3 . Within the pipe G is a musical reed g^7 , fixed transversely thereof, and a hollow sphere or ball of some light material larger than the caliber of the pipe rests loosely within the mouthpiece.

At some convenient point in the pipe G is a quick-opening wedge gate-valve g^4 , which is operated in two ways—manually and automatically. When it is desired to operate it manually, it is opened and closed by means of a hand-lever g^5 , pivoted to the valve-stem g^6 , being closed when the lever is down, as shown in the drawings. In order to operate this valve automatically, a cylinder H is provided, supported on standards h' , secured to the floor A by bolts h^2 . A piston-head h^3 is secured to the valve-stem g^6 . A vent-open-

ing h^4 is provided near the end of the up-stroke of the piston-head h^3 , while below the limit of the piston movement is inserted a pipe I, which leads from a vent i' in the cylinder C near its upper end, its exact location being determined by the position of the piston-head D when it is at its highest elevation, it being necessary that said opening i' should be below the piston when it is at its highest elevation. When the piston D is near the bottom of the cylinder, the car rests upon blocks b^7 , fixed to the floor A, said blocks being preferably made of rubber to relieve any shock which might occur in careless stopping of the car.

A circular bed-plate c^2 is bolted to the upper flanges of the topmost section c^3 of the cylinder C by bolts c^4 and has rollers c^5 , turning in bearings c^6 , secured thereto by bolts c^7 . The bearing-surfaces of said rollers are concaved to conform to the radius of the piston-rod d^2 and are arranged circumferentially, so as to embrace the piston-rod, thus properly centering the latter and serving to give ample and antifrictional support to the car when at any part of its journey.

The upper section c^3 of the cylinder C is provided with lateral orifices c^8 , which are always open and serve as a safety-valve by allowing the free escape of the compressed air from the cylinder in case the valve g^4 should for any reason fail to open by the automatic action of the piston h^3 , in which case, were no such vent provided, the piston D would continue to rise and might endanger the safety of the apparatus and its passengers were the valve f^2 not closed at the proper time.

The method of operating the apparatus will now be described. Before an ascent of the car can be properly made the disposition of the apparatus should be as follows: The storage-tank E must have a sufficient supply of air under pressure, the valves f^2 and g^4 being closed, the piston D at the lower extremity of the cylinder with the car supported upon the blocks b^7 , and the signal-ball g^8 resting within the mouthpiece of the vent-tube G. The passengers having entered the car and taken their seats and the door b^2 being closed, the operator will open the valve f^2 by means of the lever f^7 , when the air from the storage-tank will instantly rush into the cylinder C below the piston D, causing the said piston to rise, carrying the car and occupants with it. Since the area of the pipe F is very much less than that of the cylinder, the ascent of the car will be gradual and the rate of movement can be varied at will by manipulating the lever f^7 , or the car can be stopped in its ascent at any time before the piston D passes the orifice g' of the vent-pipe by simply closing the valve f^2 , which cuts off the air-supply. In practice this procedure of varying the speed of the car may be made particularly effective in producing unexpected

sensations. Instead of varying the upward speed the movement of the car may be gradual until near the highest point of its ascent, when, if desired, the car may be held stationary in order that the passengers may view their surroundings from the elevation, and this may continue as long as the operator desires. If now the upward movement of the car is continued by reopening the valve f^2 to the required extent, as soon as the piston has risen far enough to pass the orifice i' of the pipe I the air entering the cylinder H will lift the piston h^3 and through its attachment to the valve-stem g^6 will open valve g^4 . As a result the air will escape through pipe G in such quantities that the piston and car will suddenly descend with accelerated motion until the piston reaches the orifice g' , when its movement will be checked automatically by cutting off the escape of air, the confined air below it acting as a spring or cushion to gradually retard its motion and bring it gently to a full stop at some point between the terminus of the cylinder and the vent-pipe G, the car being elevated a corresponding distance above the platform A. The reaction of the confined air will then force the piston upward until the force of its expansion has been exhausted, when the piston will again fall, these oscillations continuing at a decreasing rate until the car is at rest, when it may be gradually lowered to the platform A by opening the valve f^5 . Should the valve f^2 have been left open during the descent of the piston D, the action would be the same, for in that case the check-valve f^3 will automatically prevent the air below the piston from being forced back into the storage-tank, this being an important safeguard in case the pressure within the storage-tank should have become very much lessened. During the upward movement of the piston D, just described, the air will escape through the pipe G with sufficient force to vibrate the reed g^7 , producing a musical sound, and at the same time to elevate the signal-ball g^8 to a considerable distance above the mouth g^3 , where it will remain suspended until the descent of the piston cuts off the escape of air.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus of the character specified, the combination of a vertical cylinder, a piston adapted to slide in said cylinder, a passenger-car mounted upon said piston, means for causing the said piston to move upward in said cylinder, means for automatically causing a sudden descent of the piston, and means for bringing said piston and car to a gradual stop.

2. In an apparatus of the class described, the combination of a vertical cylinder, a piston adapted to slide within said cylinder and having a passenger-car attached thereto,

means for causing said piston to move vertically in said cylinder, means for automatically causing a sudden descent of the piston, a vent-pipe for the escape of the confined air, and a signal adapted to be operated by the descent of the piston.

3. In apparatus of the class specified, the combination of a vertical cylinder, a piston adapted to slide therein, a car for passengers attached to said piston, a storage-tank for compressed air, a tube connecting the storage-tank with the cylinder, valves in said tube both automatic and manual, a valved vent-tube, means for automatically opening the valve in said tube, and a signaling apparatus operated by the escape of air through the vent-tube.

4. In apparatus of the character specified, the combination of a vertical cylinder, a piston adapted to slide therein, a car for passengers attached to said piston, a storage-tank for compressed air, a tube connecting the storage-tank with the cylinder, valves both automatic and manual attached to said tube, a vent-tube, a valve for said vent-tube both manually and automatically operated and an indicating device operated by the escape of air through the vent-tube.

5. In apparatus of the character specified, the combination of a vertical cylinder, a piston slidably mounted therein, a passenger-car attached to said piston, means for moving said piston longitudinally in the cylinder, means for causing a rapid descent of said pis-

ton, means for automatically preventing the piston from passing above a certain predetermined point in said cylinder, a vent-tube and a signaling apparatus operated by the escape of air through the vent-tube.

6. In apparatus of the class described, the combination of a vertical cylinder, air inlet and outlet pipes communicating with said cylinder, manually and automatically controlled valves arranged in said pipes, signaling devices supported by one of said outlet-pipes and adapted to be operated by the air escaping from said cylinder, a piston and piston-rod slidably mounted in said cylinder and having an air-tight fit therein, a car mounted upon said rod, and means for introducing air under pressure to said cylinder inlet-pipes.

7. In apparatus of the class described, a cylinder having induction and eduction openings therein, a piston slidably mounted in said cylinder, antifrictional means for centering and guiding said piston, a passenger-holding car secured to said piston, means for controlling the admission of a motive fluid to said cylinder, means for controlling the emission of the motive fluid from said cylinder, and a sounding device operatable by the escape of the motive fluid from said cylinder.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES I. MATSON.

Witnesses:

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CHAS. F. BASSETT.