

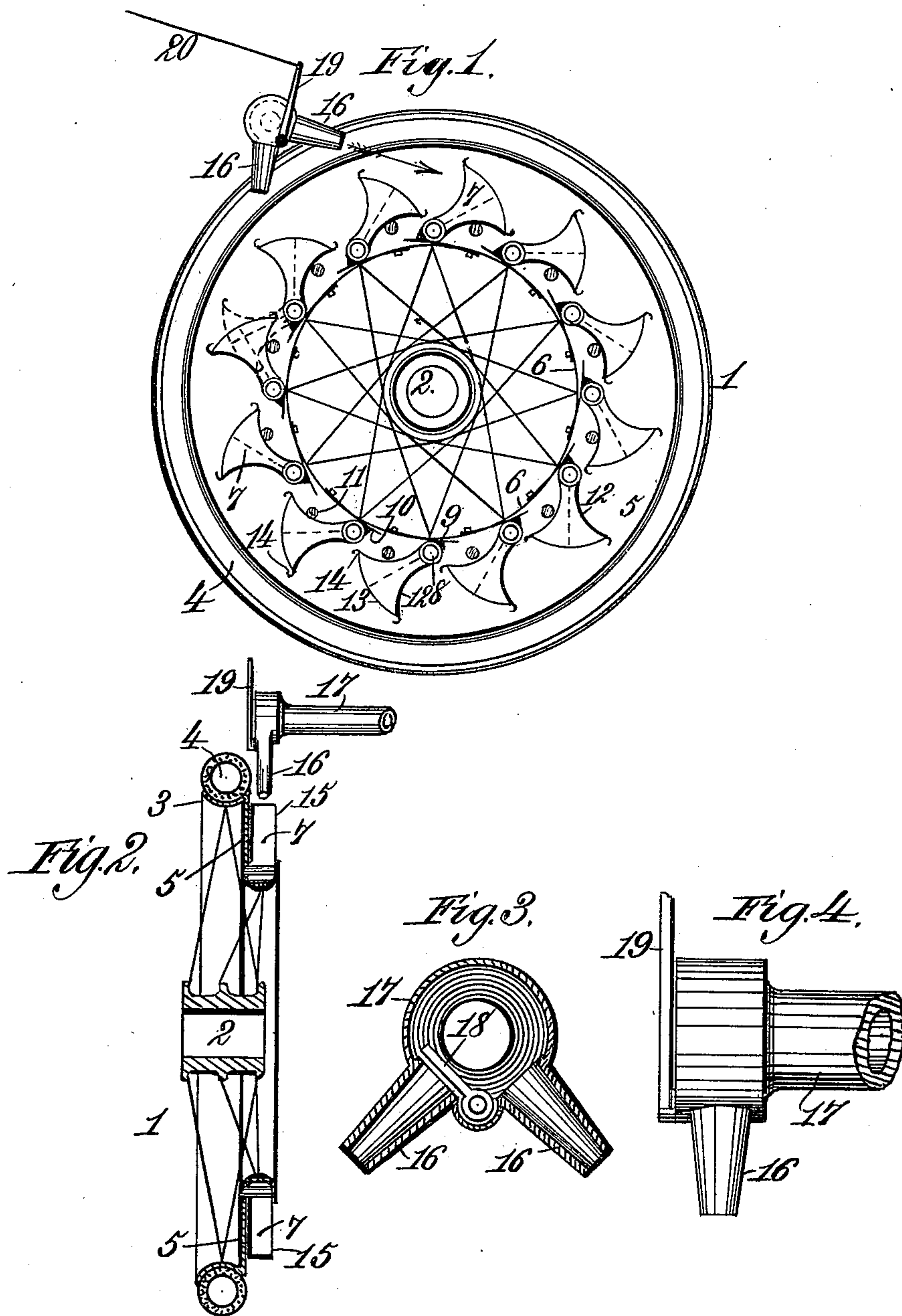
No. 652,852.

Patented July 3, 1900.

H. W. LIBBEY.
MOTOR WHEEL FOR VEHICLES.

(Application filed Oct. 2, 1899.)

(No Model.)



WITNESSES:

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HOSEA W. LIBBEY, OF BOSTON, MASSACHUSETTS.

MOTOR-WHEEL FOR VEHICLES.

SPECIFICATION forming part of Letters Patent No. 652,852, dated July 3, 1900.

Application filed October 2, 1899. Serial No. 732,405. (No model.)

To all whom it may concern:

Be it known that I, HOSEA W. LIBBEY, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Motor-Wheels for Vehicles, of which the following is a specification.

This invention relates to a motor-wheel for vehicles to be propelled by compressed or liquefied air or gas.

My invention consists in a motor-wheel having a peripheral portion provided with a series of reversible buckets that will automatically take position on said wheel to accord with the direction from which the propelling pressure is applied.

The invention further consists in the features of construction and combinations of parts in a motor-wheel provided with reversible buckets and also in the combination, with such bucketed motor-wheel, of devices for controlling the application of pressure to said buckets to accord with the direction in which the motor-wheel is to be propelled.

Other features and purposes of my invention will appear from the following description and will be specifically set forth in the claims.

In the annexed drawings, Figure 1 is a side elevation of a motor-wheel for vehicles provided with reversible buckets in accord with my invention and showing a double-nozzle device for applying pressure to said buckets in a direction to propel the wheel either forward or backward and to utilize the pressure as a brake when required. Fig. 2 is a vertical transverse section of the wheel, showing also the pressure-nozzle in front elevation. Fig. 3 is an enlarged sectional view of the double nozzle and a reversible valve to control the discharge of pressure through either branch of the nozzle. Fig. 4 is an enlarged front elevation of the nozzle with a lever for operating the valve.

In the drawings the reference-numeral 1 designates a truss-wheel which may be of the general character used in velocipedes and bicycles. The numeral 2 designates the hub of said wheel, and 3 is a peripherally-concaved rim which may have a pneumatic tire

4 applied thereto. One face of the wheel is preferably formed with a vertically-arranged annular side wall 5, having an annular horizontally-projecting flange 6 extended from its circular inner edge. To the outside of this annular side wall 5 there is pivotally attached a series of reversible buckets 7, to which the pressure for propelling the wheel is to be applied. The pivots 8 of the several reversible buckets 7 are located adjacent to the horizontally-projecting flange 6, as shown in Fig. 1, and the pivotal portion of each bucket is provided with a wedge-shaped projection 9, having a bearing against a leaf-spring 10, secured to the flange 6 in such manner as to hold the bucket in position against the action of gravity. There will be a wedge 9 and leaf-spring 10 for each reversible bucket. Intermediate the several buckets and projecting laterally from the wall 5 there is a series of stop-pins 11, through which the power applied to the several buckets is transmitted to the wheel.

Each reversible bucket 7 is constructed with externally-concaved front and rear walls 12 and with, preferably, an external convex outer end wall 13, as shown in Fig. 1. The front and rear externally-concaved bucket-walls 12 are extended beyond the end wall 13 and are formed with reversely-curved hook-flanges 14, that overhang the outer end wall of the bucket. The side walls 15 of each bucket may be flat, as shown in Fig. 2.

For the purpose of propelling the motor-wheel with its reversible buckets there is provided a double nozzle having two nozzle branches 16, that are substantially at right angles to each other. This double nozzle 16 is mounted on, preferably, one end of an air or gas conduit 17, that may connect with any suitable source of pressure, such as a storage tank or reservoir (not shown) for compressed or liquefied air or gas.

In one end of the conduit or supply-pipe 17, intermediate the two nozzle branches, there is mounted a reversing-valve 18, which may be in the form of an ordinary flap-valve, as shown in Fig. 3. The pivot of this valve 18 is provided with an arm or lever 19, Figs. 1, 2, and 4, to the outer end of which may be attached any suitable connection 20, through

which the valve may be actuated from an operating lever or device of any suitable character.

Obviously the reversing-valve 18 can be set
5 or adjusted to permit the discharge of compressed air or any suitable fluid under pressure through either nozzle branch 16 to impinge against the reversible buckets 7 in such manner as to propel the wheel either forward
10 or rearward. The hooked flanges 14 at the edges of the buckets will insure a quick reversal of each bucket when the air-blast strikes them, the reverse position of one of the buckets being indicated by dotted lines
15 in Fig. 1. In operating the motor-wheel through pressure applied to these reversible buckets the pressure is mainly applied to the adjacent concaved wall of each bucket, as indicated by the arrow in Fig. 1; but on reversing the valve 18 to permit a discharge of
20 pressure through the other nozzle branch the jet of air will strike inside the hooked flanges of adjacent buckets and reverse the same by turning them on their pivots against the pressure exerted upon the wedges 9 by the leaf-springs 10, the engagement of these springs
25 with the wedges serving to maintain each bucket in its required position against the action of gravity. When in its operative position, each reversible bucket bears against
30 one of the pins 11 projecting from the wall 5, and through these pins the power applied to the buckets is transmitted to the wheel to maintain it in rotation. By setting the valve
35 18 so as to permit a portion of the pressure to discharge through each nozzle branch any required degree of braking action can be applied to the wheel, as may be desired. This braking action is greatly facilitated by reason
40 of the buckets 7 being independently reversible. When the valve is shifted to change the direction of pressure through the nozzle branches, the jet of air impinging on the inner sides of the hooked flanges 14 will insure
45 a quick reversal of the buckets according to the direction in which it is desired to propel the wheel. When the valve 18 is set in its mid-position, the blast will blow in both directions through the two nozzle branches,
50 thus acting as a brake as well as a means of propulsion, a few of the wheel-buckets being reversed.

The construction provides simple, convenient, and readily-operated motor-wheels for
55 vehicles, which can be easily controlled according to the requirements for such wheels.

If desired, the storage-reservoirs and the several pipes and passages for compressed or liquefied air or gas may be provided with a
60 non-conducting covering, preferably composed of an inner layer of asbestos and an outer layer of rubber or rubber fabric, the asbestos being designed to protect the contents of said reservoirs and passages from the

warmth of the outside atmosphere and the rubber to afford a protection against dampness.

What I claim as my invention is—

1. A motor-wheel for vehicles, provided with a series of independently-reversible
70 buckets, in combination with a double nozzle for applying fluid-pressure to said buckets to rotate the wheel in either direction, substantially as described.

2. A motor-wheel for vehicles, provided
75 with an annular series of independently-reversible buckets, means for maintaining said buckets against the action of gravity, and devices through which the power applied to said buckets is transmitted to the wheel, in
80 combination with a double nozzle for applying fluid-pressure to said buckets to rotate the wheel in either direction, substantially as described.

3. A motor-wheel for vehicles, provided
85 with an annular series of reversible buckets, wedge projections on the pivotal ends of the several buckets, springs bearing against said wedge projections to maintain the several
90 buckets against the action of gravity, and pins projecting from the wheel intermediate the buckets and through which power applied to said buckets is transmitted to the wheel, in combination with a double nozzle for applying pressure to said buckets, and a valve
95 for controlling the blast through said nozzles, substantially as described.

4. The combination with a motor-wheel provided with an annular series of reversible
100 buckets, springs for maintaining said buckets against the action of gravity, and pins or projections through which the power applied to the buckets is transmitted to the wheel, of a double nozzle for applying a blast to said
105 buckets in either direction, and a valve for controlling the blast through the branches of said nozzle, substantially as described.

5. The combination with a motor-wheel provided with an annular series of reversible
110 buckets and laterally-projecting pins intermediate the several buckets, and springs to maintain said buckets against the action of gravity, of a double nozzle through which to apply a blast to said buckets in either direction, a valve for controlling the blast through
115 the branches of said double nozzle, and operating mechanism for said valve, each bucket being provided with hooked flanges to insure quick reversal of the bucket when the air-blast is reversed, substantially as described. 120

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HOSEA W. LIBBEY.

Witnesses:

CHAS. STEERE,
WINIFRED G. KERWIN.