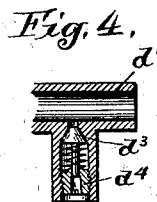
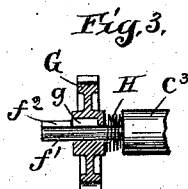
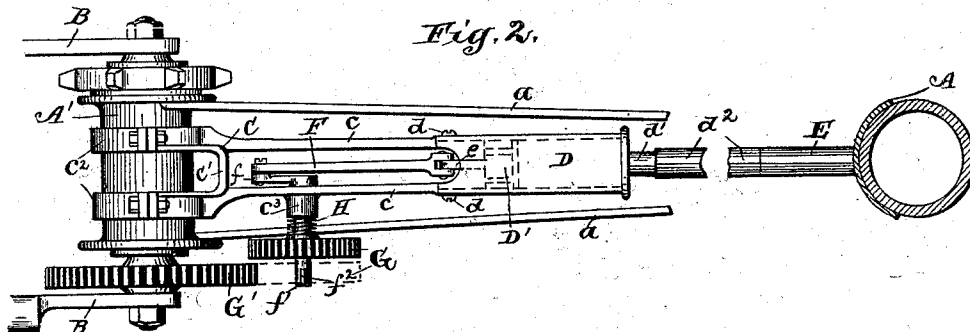
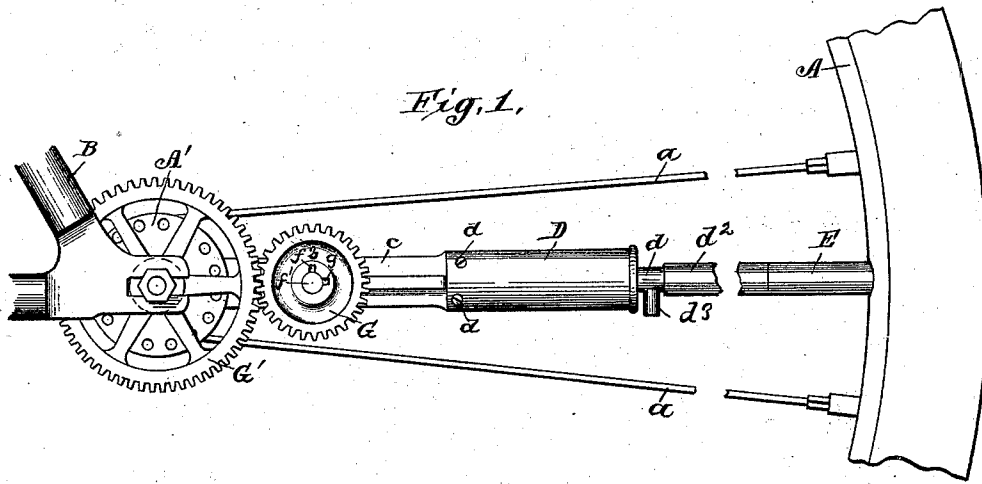


(No Model.)

L. G. SPENCER.
PUMP ATTACHMENT FOR BICYCLES.

No. 559,418.

Patented May 5, 1896.



Witnesses,
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UNITED STATES PATENT OFFICE.

LLOYD G. SPENCER, OF CHICAGO, ILLINOIS.

PUMP ATTACHMENT FOR BICYCLES.

SPECIFICATION forming part of Letters Patent No. 559,418, dated May 5, 1896.

Application filed September 23, 1895. Serial No. 563,301. (No model.)

To all whom it may concern:

Be it known that I, LLOYD G. SPENCER, of Chicago, in the State of Illinois, have invented certain new and useful Improvements in Pump Attachments for Bicycles, of which the following is a specification.

My invention relates to automatic pump attachments for bicycles; and the object of my improvements is to provide an attachment supported on the hub of the bicycle-wheel and having a gear connection with the spindle whereby the pump can be operated by the revolution of the bicycle-wheel for the purpose of inflating the hollow elastic tire. I attain this object by the means illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a fragment of a bicycle wheel and frame with the pump attachment in connection therewith. Fig. 2 is a top view of a similar fragment. Fig. 3 is a detail showing a fragment of the frame which supports the pump and the pump-operating wheel in section. Fig. 4 is a detail showing a longitudinal section of a fragment of the tube leading from the pump, and the overflow or safety valve in connection therewith.

In the drawings, A designates the rim of the bicycle-wheel with the inflatable tire in connection therewith, and a wire spokes in connection with the hub A' and rim, all of ordinary construction.

B is the frame of the machine.

C is the pump-frame, which comprises parallel bars c, connected by a cross-bar c' and clamping-pieces c², whereby said frame is clamped and fixed rigidly to the hub of the bicycle-wheel.

D designates the pump-cylinder, which has an open end secured to the parallel bars of the pump-frame by means of screws or rivets d, so as to be firmly supported on said frame. The cylinder is provided with a tube or pipe d'.

E designates a valved air-induction tube which passes through the rim and communicates with the inflatable tire in the ordinary manner, and the pump-tube d' is connected with the valved air-induction tube by means of an extension d², which is preferably a short section of elastic tubing adapted to be expanded so as to form a lap-joint in connection

with the joined parts. The cylinder is provided with a piston, (shown in dotted line at D',) which has sufficient bearing upon the side walls of the cylinder to prevent it from being obliqued therein, and it is provided with a short piston-rod e. It also has one or more openings provided with a flap-valve upon the inner side, said openings and flap-valve being of ordinary construction and not shown in the drawings, their object being to allow air to enter the cylinder when the piston is moved toward the open end of the cylinder and to prevent the air from passing the piston when moved in the opposite direction. The pitman F is pivoted to the piston-rod e at one end and mounted on a crank f at the opposite end, said crank being connected with a shaft f', journaled in a projection c³ upon the pump-frame.

The gear-pinion G is mounted loosely on the shaft f' and has a groove g, extending nearly through the hub of said pinion and adapted to engage the spline f², which is fixed to said shaft along a portion near its outer end, so as to enter said groove and hold the pinion rigidly fixed to said shaft when turned so as to bring said groove into registration therewith. A spring H, interposed between the projection c³ and the end of the hub, is adapted to hold said pinion upon the spline when in engagement therewith. When thus fixed to said shaft, the pinion is brought into the position in which it is shown in dotted lines in Fig. 2 and engages with a cog-wheel G', which is fixed to the spindle upon which the bicycle-wheel hub revolves, so that the pinion G, which is carried round in a circular orbit by a movement of the bicycle-wheel, will thus be made to operate the pitman for working the pump, the crank and pitman playing between the parallel bars c of the pump-frame.

The pump-frame is connected with the bicycle-wheel hub so as to come between the spokes shown in Fig. 2, the projection c³ extending out between the spokes so as to support the pinion G just outside the spokes. The pump-pipe d' is provided with a spring-pressed safety-valve d³, which is made adjustable by means of the screw-plug d⁴, so that the valve may be regulated to a certain pressure or varied therefrom, when desired. By this means the flexibility of the inflatable

tire is made adjustable, and the maximum limit of pressure therein may be fixed to correspond with the resistance offered by the safety-valve, as the pump will not force air
5 into the tire when the pressure of the pump-tube becomes greater than the resistance of the safety-valve.

The operation is as follows: The tire being in a collapsed condition the pinion G is turned
10 into engagement with the spline f^2 and with the wheel G', in which position it will be held by the spring H. The pump can then be operated by revolving the bicycle-wheel until the pressure is raised to a point where it will lift
15 the safety-valve and allow the air to blow off thereat. Then the pinion G is shoved back and partially revolved, so that the groove g will be out of line with the spline f^2 and will rest against the end of the hub and so
20 hold said pinion out of gear until another pumping operation is required. It is contemplated that a pump of the character described will be attached to each of the bicycle-wheels in the manner shown, the pump and its frame
25 attachment being made very light and disposed of between the spokes, so as to be out of the way and not interfere with the operation of the wheel when the pump is not in use.

What I claim is—

A pump attachment for pneumatic tires for
30 bicycle-wheels comprising a pump-cylinder adapted to be mounted rigidly on the hub of the wheel, a pipe adapted to connect the pump-cylinder in communication with the ordinary
35 valved air-induction tube of the pneumatic tire, an adjustable safety-valve in communication with the pipe, a crank-shaft journaled in a support connected with the pump-cylinder and having immovable relation therewith,
40 a pitman pivotally connecting the crank of the crank-shaft with a non-obliquing piston fitting in the pump-cylinder, a spring-pressed pinion having an internal grooving being
45 loosely mounted upon the crank-shaft and adapted to slide automatically into engagement with a spline fixed upon the crank-shaft when the internal groove is turned so as to register with the spline, and a cog-gear fixed
50 to the axle of the bicycle-wheel so as to mesh with the spring-pressed pinion when moved into engagement with the spline as specified.

LLOYD G. SPENCER.

Witnesses:

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