No. 680,255. Patented Aug. 13, 1901.

H. LIEBERTHAL.

WHEEL.

(Application filed May 13, 1901.)

(No Model.)

Fig. 1.

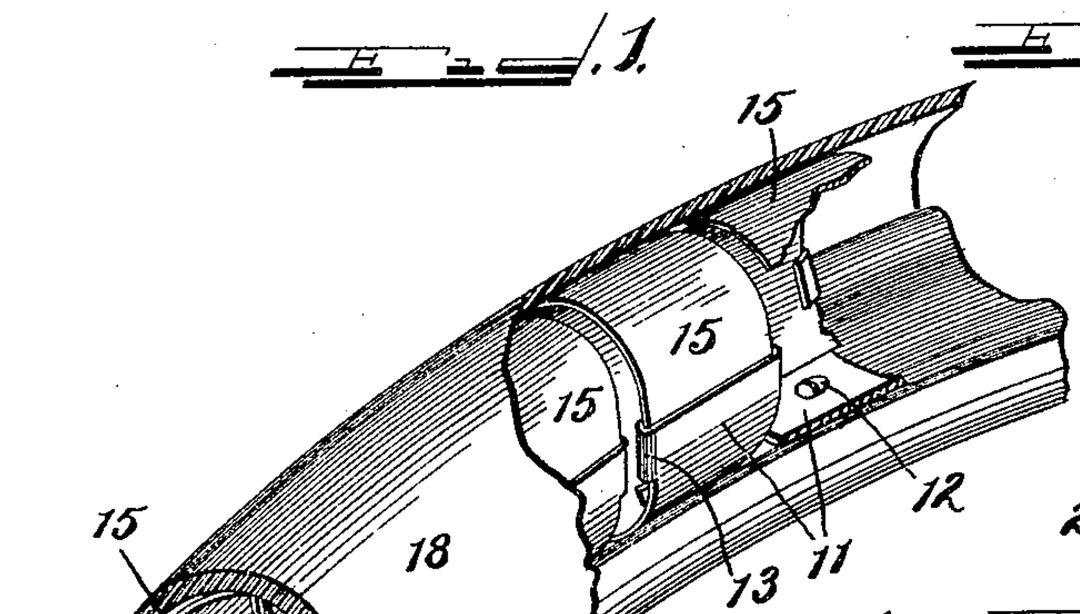


Fig. 2.

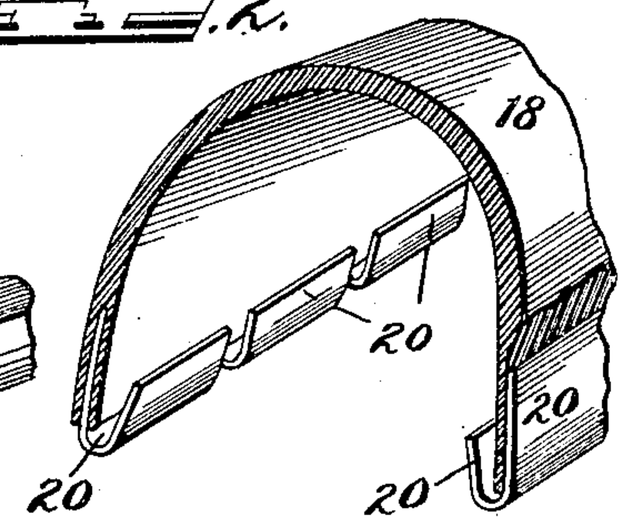


Fig. 3.

Fig. 4.

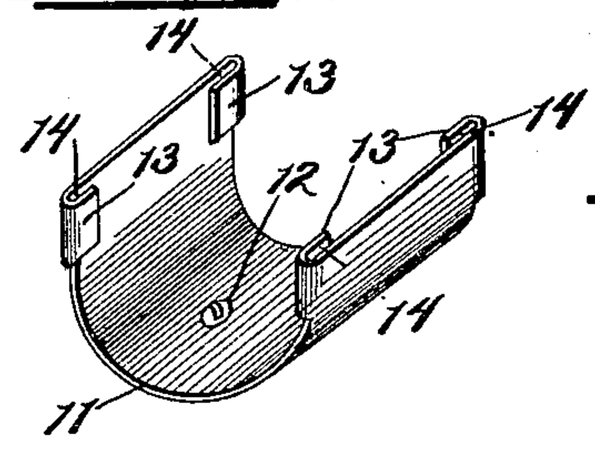


Fig. 5.

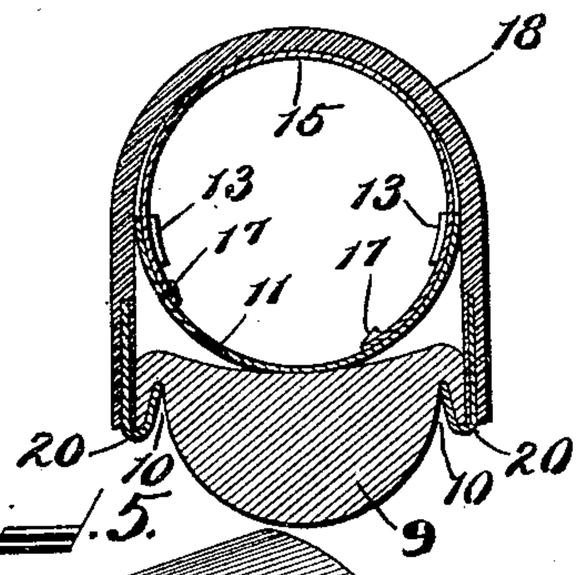


Fig. 6.

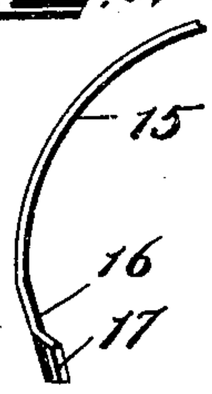


Fig. 7.

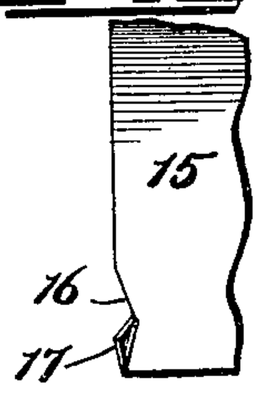


Fig. 8.

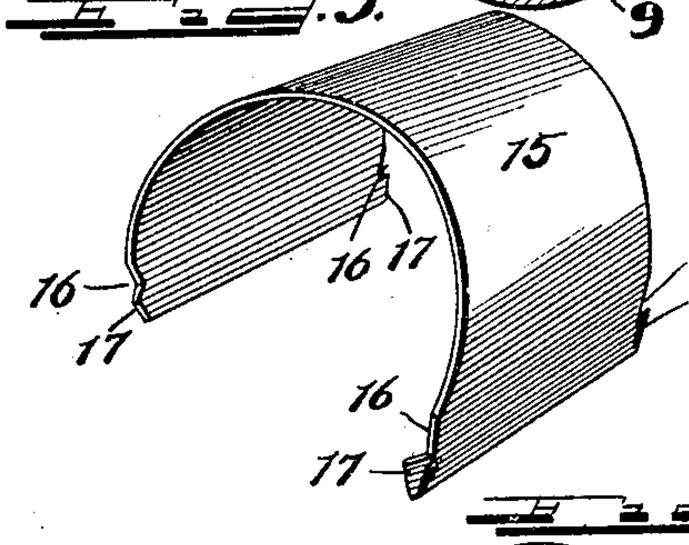
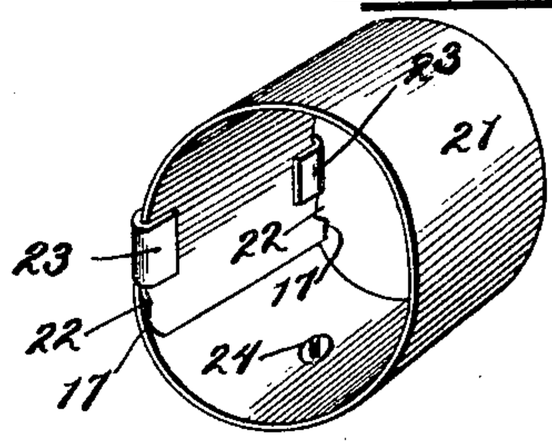


Fig. 9.



Witnesses

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UNITED STATES PATENT OFFICE.

HYMAN LIEBERTHAL, OF CHICAGO, ILLINOIS.

WHEEL.

SPECIFICATION forming part of Letters Patent No. 680,255, dated August 13, 1901.

Application filed May 13, 1901. Serial No. 59,976. (No model.)

To all whom it may concern:

Be it known that I, HYMAN LIEBERTHAL, 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 Wheels, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to wheels designed primarily for use on bicycles, but which may be used with other styles of vehicles where it is desirable to provide for as great freedom as possible from jolts and jars incident to the passing over uneven roads or over obstructions in the path of the wheels.

One of the objects of my invention is to provide a wheel with a tire having the advantages of the pneumatic tire, but without the disadvantage of being liable to be punctured and rendered useless, as are all pneumatic tires. This I accomplish by means of a series of springs secured in any suitable manner to the rim of the wheel, said springs being each composed of a flat strip of metal bent into suitable shape and provided on its ends with locking means which, while securely holding such spring in its bent or curved position, allows such spring to give sufficiently to prevent jolt or jar when passing over an uneven road or an obstruction on the road.

Another object of my invention is to provide an improved means for fastening in place to the rim of the wheel the usual flexible covering or tire proper that is always employed in wheels of this general description.

I accomplish these objects by the means shown in the drawings and hereinafter specifically described.

That which I regard as new will be set forth in the claims.

In the accompanying drawings, Figure 1 is a perspective view of a portion of a wheel-rim equipped with my improved devices, a portion of the flexible covering being broken away to better illustrate the construction and arrangement of the springs. Fig. 2 is a perspective view of a section of the outer flexible covering shown in Fig. 1, a portion of such covering at one end being broken away to better show the securing means attached to said covering. Fig. 3 is a cross-section through a wheel-rim with my improved devices applied thereto. Fig. 4 is a perspective view of one of the spring-bases that is adapted to be secured to a wheel-rim. Fig. 5 is a perspective view of one of the springs adapted to be engaged with the spring-base shown in Fig. 4. Fig. 6 is a side elevation of one half or side of the spring shown in Fig. 5. Fig. 7 is a view of the inner face of one side of the spring shown in Fig. 5, a portion being broken away; and Fig. 8 is a perspective view of a modification.

Referring to said drawings, 9 indicates a wheel-rim having at each side longitudinally-disposed grooves 10.

11 indicates a series of spring-bases, each adapted to be secured to the upper face of the wheel-rim by screws 12 or in any other suitable manner. Each spring-base is formed of a strip of spring metal and is curved or bowed at each side of its center, so that its ends are above and substantially in line with the outer edges of the rim 9. At each upwardly-extending end of each base 11 and extending inwardly from each side thereof is a tongue 13, which, as shown, is formed integral with the spring-base, but may of course be formed separate therefrom and suitably attached to such spring-base. These tongues, as shown, stand out a little from the inner curved face of the base, leaving narrow openings 14 between such tongues 13 and the sides of the spring-base. These spring-bases, as shown in Fig. 1, are slightly separated from each other.

15 indicates a series of springs, each formed from a strip of sheet metal and bowed or curved on each side, and near the ends of the springs are cut small notches 16, below which are formed small ears 17, each of which, as shown, is given a slight inward bend. The width of the spring-bases 11 and the springs 15 is substantially the same, and the ends of each spring are adapted to be entered in the openings 14, formed by bending over the tongues 13, and when such ends of the spring are pushed down, so as to bring the ears 17 below the tongues 13, such ears will engage the lower edges of the said tongues and prevent the accidental withdrawal of the ends of the spring. This engagement of the ears 17 with the lower edges of the tongues is in-

sured by reason of such ears being given the small inward bend referred to, which bend is particularly observable in Fig. 6. While the spring-base and the spring are thus securely held together, such parts can be readily disengaged when necessary by a slight manipulation on the part of the operator, as the inwardly-bent ears 17 can be readily sprung back sufficiently to allow the spring 15 to be disengaged and withdrawn from its spring-base. The engagement of the parts, as described, while sufficient to prevent accidental withdrawal of the ends of the spring does not prevent the yielding of such spring when yielding is required to prevent jolting or jarring, and when such yielding takes place it is by reason of the curved ends of the spring 15 sliding farther down within the curved spring-base, as will be readily understood, and when the pressure on such spring is released it will return to its normal position and be prevented from disengagement from the spring-base, as before explained.

18 indicates a flexible covering, such as is ordinarily employed on pneumatic and other elastic tires. The edges of this covering are notched at regular intervals, as indicated at 19, in Fig. 1, these notches lying, when the covering is in place, opposite the spaces between the series of spring-bases 11. This covering is provided between the notches 19 with hooks 20, which, as shown, are each formed from a flat piece of metal properly bent into hook shape, the hook portions being turned inward to adapt them to enter the longitudinal grooves 10 in the rim 9. These hooks are, as shown, embedded in the covering 18 and may be there secured by any suitable means, preferably by the rubber of the covering being vulcanized to the material of the hooks.

The parts are very readily assembled, the tire being first provided with a number of spring-bases 11, secured upon said tire, as shown, or in any other suitable manner, and spaced a slight distance apart, after which a curved spring 15 is secured in the manner described in place in each of the spring-bases and the flexible covering 18 then placed over the springs and the springs compressed sufficiently to allow the hooks 20 to be secured, as shown, to the rim. In case of breakage or other accident occurring to any one of the springs or spring-bases the covering opposite the point of breakage and for a short distance each side can be readily disengaged from the rim to allow access to the interior for the purpose of repairing or replacing the broken or damaged part, and by having such covering slotted at each side of the retaining-hooks 20 the operator is enabled to more readily disengage the few hooks required to be disengaged than if such tire were not so slotted. By having the parts of the hooks that are attached to the covering embedded in such covering, as shown, a neater finish is obtained than if the hooks were secured to the outer face of the covering, for in the construction shown such hooks are practically all covered from observation.

In Fig. 8 I have shown a modification wherein the spring-base and spring are made in one piece of flat spring metal, such combined base and spring being indicated by 21. In this construction the ends of the strip overlap, as shown, one of the ends being provided with notches 22 on each side thereof and below each notch with a projecting ear 17, such notches and ears corresponding to the notches 16 and ears 17 of the construction illustrated in the other figures of the drawings. On the other end of the device tongues 23 are formed that correspond in construction and function with the tongues 13, before described in connection with the other construction. This device is also secured in place by a screw (indicated in this figure by 24) or in any other suitable manner.

That which I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with the rim of a wheel, of a series of curved spring-plates carried thereby, each of said springs having formed on its end a lip, a tongue above said lip with which said lip is adapted to engage to hold the spring in position, and a suitable covering for the springs, substantially as specified.

2. The combination with the rim of a wheel, of a series of curved spring-plates carried thereby, each of said springs having formed on its end a laterally and inwardly projecting lip, a tongue above said lip with which said lip is adapted to engage to hold the spring in position, and a suitable covering for the springs, substantially as specified.

3. The combination with the rim of a wheel, of a series of bases attached to the rim, a series of curved spring-plates carried by and movable in said bases, means for securing said spring-plates against accidental withdrawal from said bases, and a suitable covering for the springs, substantially as specified.

4. The combination with the rim of a wheel, of a series of curved bases 11 attached to the rim, tongues 13 on said bases, a series of springs 15, each adapted to have its ends inserted between the inner face of one of said bases and the tongues carried by such base, means carried by the spring and adapted to contact with one of the tongues to prevent accidental withdrawal of the spring from the base, and a suitable covering for the series of springs, substantially as specified.

5. The combination with the rim of a wheel, of a series of curved bases 11 attached to the rim, tongues 13 on said bases, a series of springs 15, each adapted to have its ends inserted between the inner face of one of said bases and the tongues carried by such base, projecting lips at the ends of the springs adapted to contact with said tongues, and a suitable covering for the series of springs, substantially as specified.

6. The combination with the rim of a wheel,

of a series of curved bases 11 attached to the rim, tongues 13 on said bases, a series of springs 15, each adapted to have its ends inserted between the inner face of one of said bases and the tongues carried by such base, laterally and inwardly projecting lips at the ends of the springs adapted to contact with said tongues, and a suitable covering for the series of springs, substantially as specified.

7. The combination with the rim of a wheel, of a series of curved spring-plates carried by said rim, both ends of each of said spring-plates being adapted to move toward and away from the center of said rim, means for retaining said springs in position, and a suitable covering for the springs, substantially as described.

8. The combination with the rim of a wheel, of a series of bowed springs extending transversely of the said rim, means for permitting both ends of each of said springs to move toward and away from the center of said rim, means for securing said springs in position, and a suitable covering for the springs, substantially as described.

HYMAN LIEBERTHAL.

Witnesses:
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