ALBERT BALL. Wheel.

No. 120,022. Patented Oct. 17, 1871.

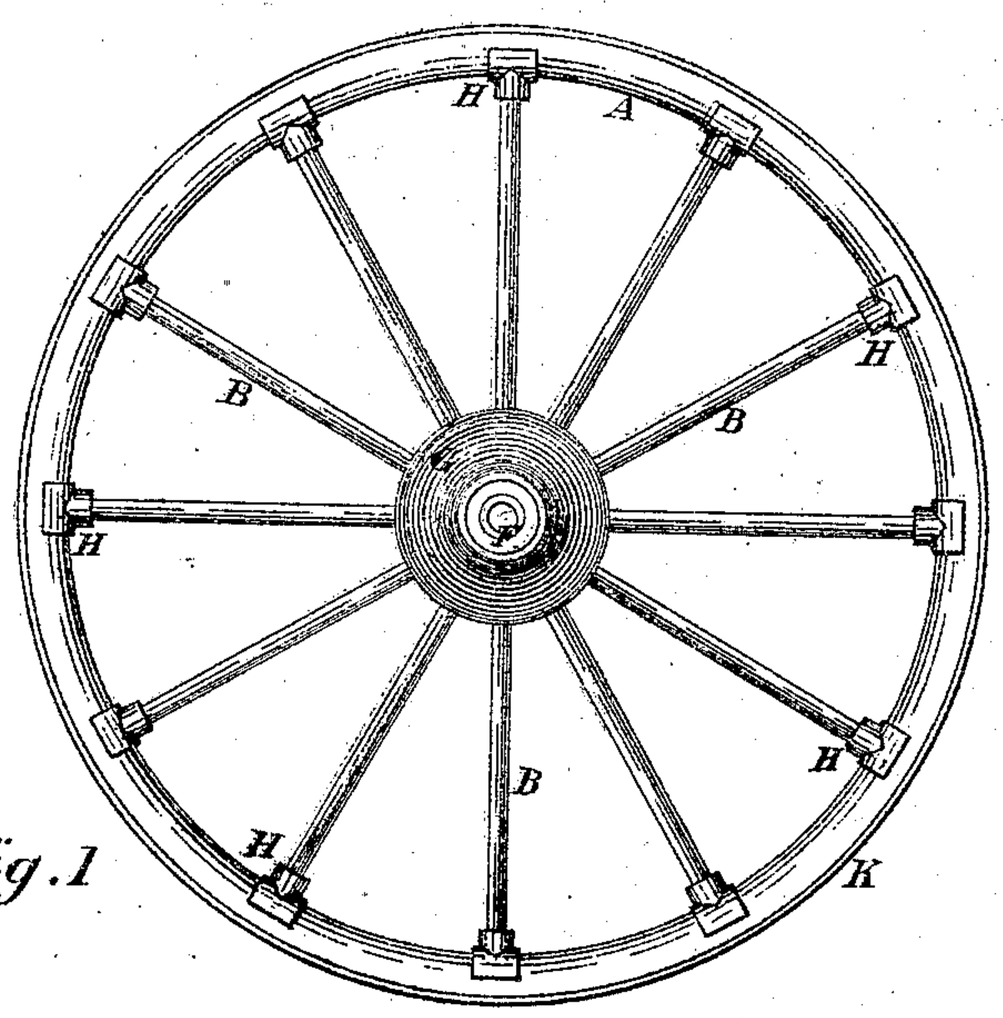

Fig. 1

Fig. 4.

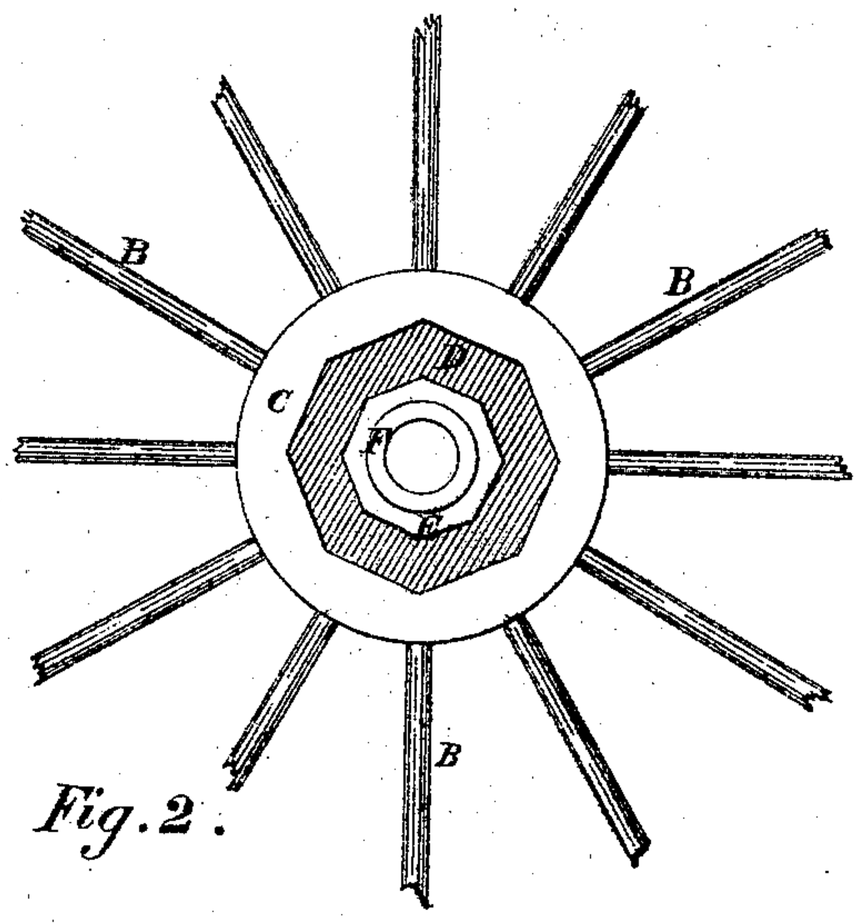

Fig. 2.

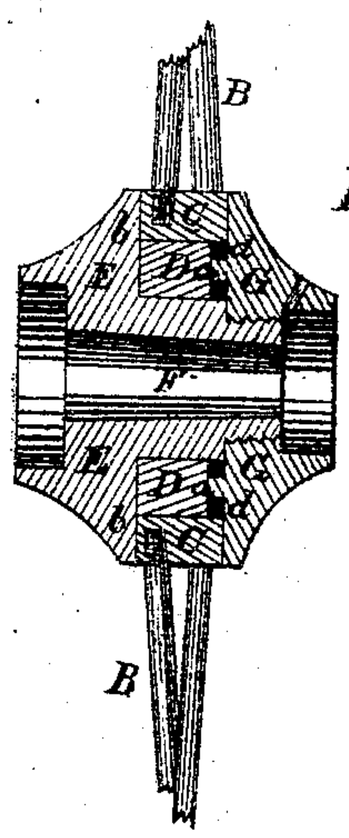

Fig. 3.

Witnesses.
H. H. Trump
A. Choffin

Albert Ball Inventor
by Jobabbott Attorney.

UNITED STATES PATENT OFFICE.

ALBERT BALL, OF CANTON, OHIO.

IMPROVEMENT IN WHEELS FOR VEHICLES.

Specification forming part of Letters Patent No. 120,022, dated October 17, 1871; antedated October 14, 1871.

To all whom it may concern:

Be it known that I, ALBERT BALL, of Canton, Stark county, Ohio, have invented certain Improvements in Wheels; and that the following is a full, clear, and exact specification thereof.

My invention relates to the construction of a carriage-wheel composed of a cast-iron hub, made in three parts, and provided with an elastic packing-ring, and of a series of iron spokes inserted in the movable hub-ring, and of a bent wooden felly, arranged on metal clips at the ends of the iron spokes and encircled by an iron or steel tire; the object being to obtain a wheel combining the advantages of an elastic iron hub with the strength and stiffness due to the use of iron spokes and the lightness and peculiar flexibility of the bent wooden felly, thus making the whole wheel of great strength and durability with as little weight as possible, and with the greatest amount of elasticity consistent with the proper stiffness.

Figure 1 is an elevation of a wheel embodying my improvements. Fig. 2 is an elevation of the hub with the head-piece removed. Fig. 3 is a cross-section of the hub. Fig. 4 is a section of the felly and felly-seat.

The hub-ring C, into which the spokes B B are screwed, is of the general form shown in Figs. 1 and 2, its inner surface being made in an octagonal or other polygonal form, and its opposite faces being turned up true and flat and exactly parallel to each other. The box-piece E has the tapering hole for the axle-spindle formed through its center, and the body of the piece is made of an octagonal form corresponding with that of the inner face of the hub-ring C. The face *b* of the head of the box-piece E is turned up flat and at right angles to the axis of the spindle, and the threaded neck F is formed at the end of the body of the box-piece, as shown in Fig. 3. The head-piece G has a thread cut on its inner surface and screws onto the neck F, as shown, and its face *d* is turned flat and at right angles to the axis of the spindle; the raised ring *a* being left on this face midway between the hub-ring C and the body of the box-piece E, as shown in Fig. 3, to act as a compress for the rubber packing-ring D, if found desirable, although this will usually be unnecessary. The box-piece E and head-piece G are so constructed as that when screwed together the distance between the adjacent faces *b* and *d* shall be exactly equal to the thickness of the hub-ring C, from which it is seen that that part of the hub consisting of the box and head-pieces can be moved up or down or from side to side in the hub-ring; but that, at the same time, there can be no side lateral movement of the hub-ring, and, consequently, of the wheel without a corresponding movement of the box and head-pieces, so that the solidity of the wheel against side vibrations of the carriage is not affected. Between the hub-ring C and box-piece E is placed the India rubber or gutta-percha packing-ring D, which is of a suitable form to fit tightly between said pieces, as shown in Figs. 2 and 3. The several parts being placed together as described it is readily seen that when the wheel strikes a stone or other obstacle the impact imparted to the felly is transferred by the spokes to the hub-ring, and is taken up from said hub-ring by the elastic packing-ring, upon which it will have a bearing in every position of the wheel, so that the effect of the impact is taken up in the hub without the injurious shock to the spindle in the ordinary construction of wheels with solid hubs. The interior of the hub-ring, exterior of the box-piece and the packing-ring, all being of a similar angular form, it is seen that the box-piece cannot rotate in the hub-ring, so that there is no wear upon the packing-ring except such as results from compression. The spoke seats H are conveniently made of malleable iron, and are of the general form shown in Figs. 1 and 4. A thread is cut on the ends *e* of the spokes B, and a corresponding thread is cut in the neck portion of the felly-seats H, so that they can be screwed one by one onto the spokes B, as is readily seen. The ends *e* of the spokes B are allowed to project through the felly-seats H, as shown in Fig. 4, and holes are bored in the felly A to admit the ends of the spokes. The felly A being bent in two or more pieces it is readily placed in position on the seats H, after they have been screwed onto the spokes, in a manner evident to any mechanic, and the tire K can then be shrunk on in the ordinary manner.

This construction affords a ready mode of tightening the tire, as by taking off the tire and the wooden felly the felly-seats may be turned back a half-turn or more, thus increasing the distance

between the felly and hub, and causing the tire and felly to fit tightly when again placed in position.

It is evident that the same general plan of hub construction would be applicable to wheels in which the axle-spindle was made fast in or even a part of the box-piece E; but, as before stated, the construction shown is designed particularly for the ordinary carriage-wheel.

What I claim herein as new, and of my invention, and desire to secure by Letters Patent, is—

The within-described carriage-wheel, the same consisting of the elastic hub E C G, composed of the box-piece E, head-piece G, hub-ring C, and elastic packing-ring D, the iron spokes B B provided with the clips H, the bent wooden felly A, and the iron or steel tire K, the several parts being constructed and combined substantially as and for the purpose specified.

As evidence of the forgoing witness my hand this 27th day of December, A. D. 1870.

ALBERT BALL.

Witnesses:
JOB ABBOTT,
B. D. WILSON. (31)