(No Model.)

J. K. SAX.

CAR WHEEL.

No. 344,547. Patented June 29, 1886.

Fig 1.

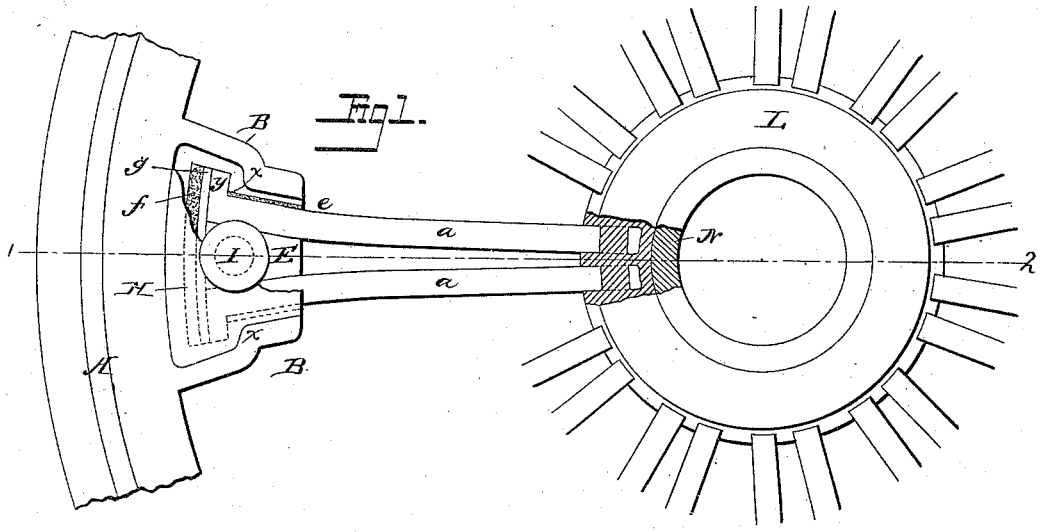
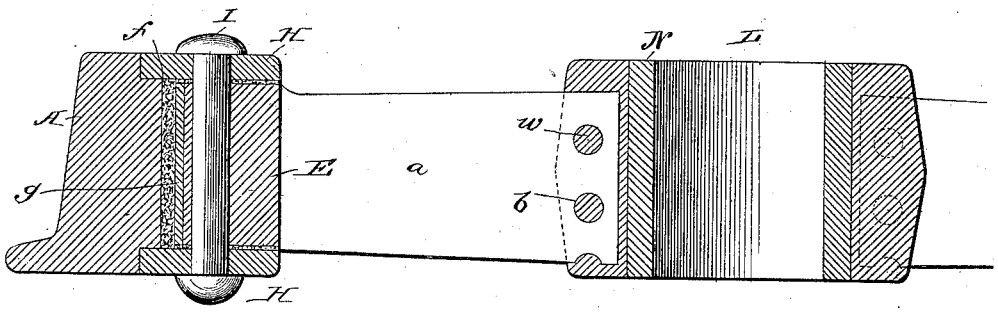


Fig 2.



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UNITED STATES PATENT OFFICE.

JOHN K. SAX, OF PITTSTON, PENNSYLVANIA.

CAR-WHEEL.

SPECIFICATION forming part of Letters Patent No. 344,547, dated June 29, 1886.

Application filed October 21, 1885. Serial No. 180,541. (No model.)

To all whom it may concern:

Be it known that JOHN K. SAX, a citizen of the United States, and resident of Pittston, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in the Manufacture of Car-Wheels, of which the following is a specification.

My invention is an improved car-wheel, constructed as fully set forth hereinafter, so as to secure an effective and somewhat elastic detachable connection of the spokes with the rim or tire and a strong and permanent union of the rear ends of the spokes and the hub and form a hub adapted to be closely fitted to the axle without the usual expensive forging operations.

In the drawings, Figure 1 is a plan in part section of sufficient of a car-wheel to illustrate my improvements. Fig. 2 is a section on the line 1 2, Fig. 1.

The rim of the wheel A is constructed in any suitable manner to provide it with sockets adapted to receive the ends of the spokes and the plate and packings and separating-wedge, described hereinafter. Preferably the rim is made of cast metal, with inwardly-projecting lugs B, in which the sockets are formed, and each socket is enlarged toward the outer portion to form a shoulder, *x*, and is contracted toward the mouth, as shown in the drawings.

Each spoke consists either of a single bar split at the end, as in Fig. 2, or of two separate bars connected at the inner ends to the hub. In either case the ends or prongs *a a* are bent or formed to constitute shoulders *y*, which, when the said prongs are introduced into the socket in the position shown in the drawings, engage with the shoulders *x* of the socket, and thereby prevent the radial withdrawal of the spokes from the sockets.

In order to spread apart the prongs and confine them closely against their bearings, I make use of an intermediate wedge, E, which is forced between the prongs and tends to separate them, and in order to prevent rattling, and secure a more solid structure, I prefer to interpose between the outer face of each prong and the inner adjacent side of the socket a packing, *e*, of leather, wood, rubber, felt or other elastic material.

The forked spokes and socketed rim may be used alone in the compound wheel; but I prefer to employ these features in combination with the side packings already described, and also in connection with a peripheral packing, *f*, and when the latter is used I prefer to also employ a plate, *g*, extending across the ends of the prongs *a a* and across the end of the wedge E, and confining the packing *f* between it and the outer end of the socket. This packing *f* should be confined under considerable compression or should be of comparatively solid material, inasmuch as it serves to support the weight carried by the wheel, but being elastic it also serves to impart that limited elasticity to the wheel which is so desirable in such structures.

In order to confine the parts within the socket in their places, I use in connection with the same a covering-plate or cap-plate, H, adapted to a shallow recess in a projection, B, and extending over the ends of the prongs, the wedge, packing, and plate, and secured in position by suitable bolts.

A single bolt, I, extending through the plate H and through the wedge E, and through the inner side of the projection B, may serve as a means of connecting all the parts together and to permit the ready detachment of the covering-plate for the purpose of arranging or disconnecting the parts.

The prongs *a* may be made into different shapes, according to circumstances and the construction of the wheel and the forms of the sockets, it being necessary only that they be provided with shoulders so arranged as to engage with corresponding shoulders upon some portion of the socket.

It is not always necessary that the socket be uncovered at one side, as it may be open at the contracted end only, and the prongs *a a* may be drawn together to permit them to be introduced into the said end and then forced inward until they expand with the shoulders *x y* in contact, a transverse bolt or bar being then introduced between the prongs to maintain them separated.

The inner end of each bar or spoke *a* has

transverse perforations *b*, and the hub is formed by pouring hot metal into the mold of suitable shape, so as to inclose the ends of the spokes and extend through the said perforations in the form of tenons *w*, which effectually lock the spokes in place, and each spoke may also have a recess at one or both edges, into which the metal may flow, and it may be widest at the inner end, so as to dovetail into the cast body of the hub, as shown in Fig. 2.

To secure greater strength and a closer binding of the hub upon the axle, I provide each hub with a lining, N, of steel, consisting of a hollow steel cylinder, which is inserted in the mold and the body L of the hub cast round it, and in order to heat this steel cylinder or sleeve and insure its firm connection with its cast-metal portion, I fill the sleeve for several minutes before the casting of the portion L with hot metal, which heats the sleeve and causes its outer surface to fuse with the molten metal thereafter cast against it, and after the portion of metal forming the hub L has well set and the wheel is sufficiently cold to be removed from the mold and the plug of metal within the sleeve N has shrunken, I punch out this plug, leaving the hub with its inner steel lining. I thus secure an extremely strong and durable connection of the hub with the spokes, and form a strong hub without the usual expensive forging, and also by the use of the inner steel sleeve prevent the accidents which might result from the fracture of the cast-iron portion of the hub.

I do not herein claim the mode of casting the hub, as that will be made the subject of a separate application for Letters Patent.

Without limiting myself to the precise construction and arrangement of parts shown and described, I claim—

1. The combination, in a car-wheel, of a rim provided with sockets having shoulders *x*, and spokes adapted to said sockets and provided with shoulders *y*, arranged to engage with the shoulders of the sockets, substantially as described.

2. The combination of the rim having sockets and shoulders, and the spokes terminating in prongs having shoulders adapted to engage with shoulders of the sockets, substantially as described.

3. The combination, in a car-wheel, of a rim provided with shouldered sockets and spokes having terminal prongs with shoulders, and a wedge or block arranged to separate the said prongs, substantially as set forth.

4. The combination, with the rim having shouldered sockets and spokes having terminal shouldered prongs, of packings *e* and separating-wedge E, substantially as described.

5. The combination of a rim having shouldered sockets, shouldered spokes, and an elastic packing confined between the ends of the spokes and the corresponding sides of the sockets, substantially as described.

6. The combination of the rim having shouldered sockets, of shouldered spokes, separating-wedge, a plate, *g*, and packing *f*, substantially as described.

7. The combination of the rim having shouldered sockets, shouldered spokes, and a detachable cap-plate, H, substantially as set forth.

8. The combination of the perforated spokes, the hollow steel cylinder, and cast-metal hub surrounding and inclosing the spokes and extending through the perforations thereof and fused to the face of the cylinder, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN K. SAX.

Witnesses:
JOHN M. REAP,
FRANK C. MOSIER.