H. NYCUM.

Hub.

No 14.407. Patented Mar 11, 1856.

Fig: 1.

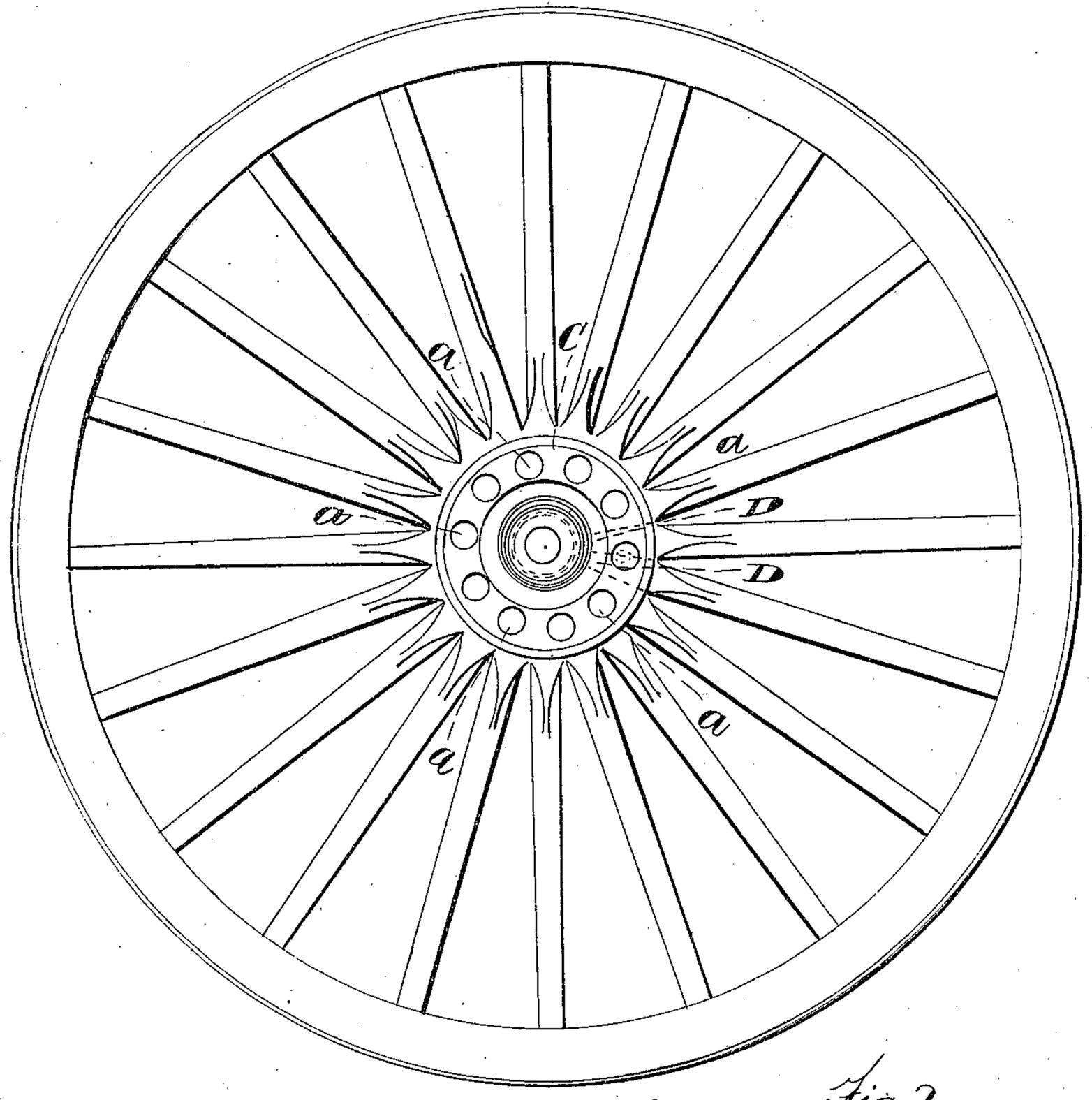


Fig: 2.

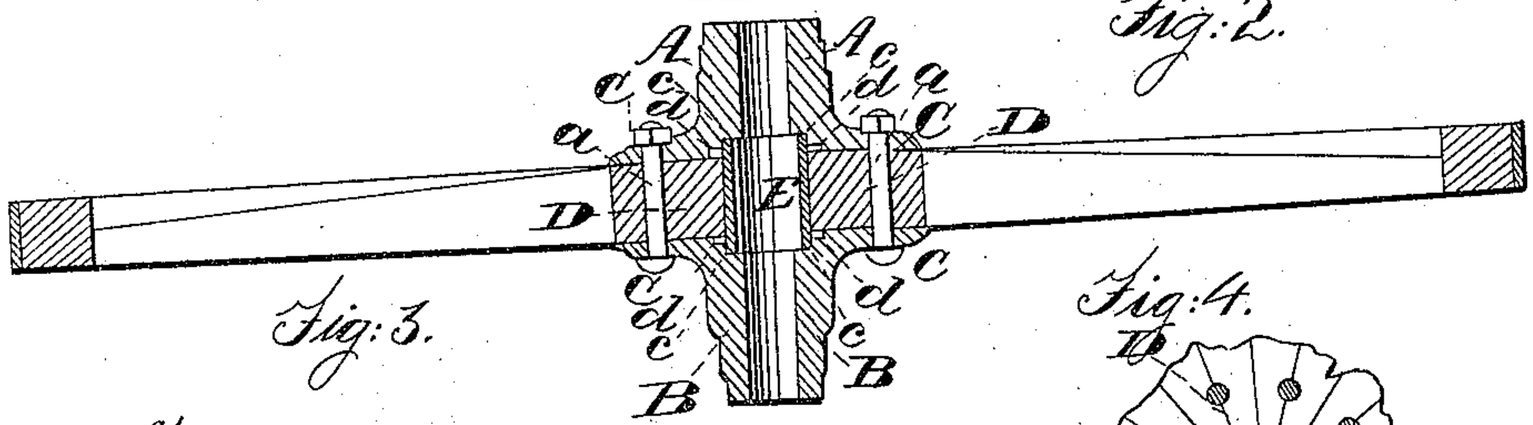
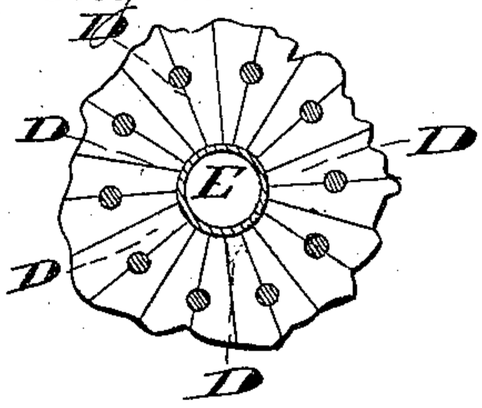


Fig: 3.

Fig: 4.



UNITED STATES PATENT OFFICE.

HENRY NYCUM, OF UNIONTOWN, PENNSYLVANIA.

CARRIAGE-HUB.

Specification of Letters Patent No. 14,407, dated March 11, 1856.

To all whom it may concern:

Be it known that I, HENRY NYCUM, of Uniontown, in the county of Fayette and State of Pennsylvania, have invented certain new and useful Improvements in the Construction of Carriage-Hubs; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 represents a side elevation of a wheel and hub. Fig. 2 represents a vertical transverse section of the same. Fig. 3 represents a similar section with the back section of the hub removed, to show how a new spoke may be introduced and Fig. 4 represents a broken vertical section through the hub, and the tenons of the spokes.

Similar letters in the several drawings denote like parts.

The nature of my invention relates to the particular manner in which I make and unite the sections which compose the hub, so as to give it great strength and lightness, and facilitate the introduction of new spokes for those which may accidentally be broken.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings, and show wherein my plan differs most essentially from others of somewhat similar appearance and construction.

My hub is of that class which admits of the removing and replacing of a spoke without cutting the tire, or of removing it from the wheel, or in any manner disturbing it. I am aware that several plans for doing this have been essayed, and it is to overcome the defects in these several plans that I have devised the mode which I shall presently describe.

Owing to the "dishing" of carriage wheels, which must be done, to keep them in any sort of shape, a spoke must of necessity be introduced from the back or rear part of the wheel, otherwise it cannot have a firm bearing at its inner end, as will be explained in reference to Fig. 3. To do this the back section of the hub must be removable. I consider then that, the hubs, the back section of which cannot be removed, among which is that patented to W. Mansfield 8th May 1847, do not come into conflict with my plan, as by his plan, the front section only being removable, a spoke cannot be introduced, and make it fit, as he must put it in on the concave side, instead of the convex side, which I shall show to be impracticable.

There are wheels which have the back section removable, but then the pipe of the front section extends through the back section, and it remains there after the back section is removed, in the way of the introduction of a new spoke, which must be forced into its mortise in the felly from the side of the pipe, or from its top, either of which endangers or injures the tenon on the spoke besides inconveniencing the mechanic who puts it in. Mine differs essentially from these, because in removing the back section from my wheel, the pipe is removed with it, leaving an uninterrupted space, and so that the spoke may be driven straight into the felly. There is still another modification of the above plans, in which a central metallic section is used with mortises in it, into which the spokes are driven. By this plan the back section and pipe are both removed, but a wheel thus constructed cannot by any possibility have in it a sufficient number of spokes to make it of the required strength—it only admitting of about eight spokes, when there should be sixteen. Besides this insuperable objection on account of strength, it is much too weighty for any ordinary carriage. These therefore I consider of an entire different construction from mine. Besides there are in all these aforementioned wheels, radical defects in their details, as for instance, the pipe or tube in the center of the hub, is so large as to materially shorten the length of the tenon on the inner end of the spoke, and thus take from it the support it should have there, or else the hub must be so enlarged as to make its weight equally objectionable. Again in most of them there is no oil chamber, the bore being uniform through the pipe; and this too takes away the end bearings on the journal by making it continuous clear through the tube. And there are none of them, in which when a new spoke is being driven into its place, the spoke shall have an end bearing at each of its ends. In the construction or repair of my wheel, there is no part or portion to be done, but what the ordinary tools in a blacksmith shop will accomplish, while in all or nearly all of those of which I have knowledge, engine or lathe work must be used, either in fitting the tube to the sections

or in chasing the large screws (which cannot be done with a die). I am thus particular in drawing the main distinctions between my hub, and others most like it, to show what I have accomplished over and above what has heretofore been done.

In Fig. 1 I have represented an elevation of a hub and wheel complete, in which there are twenty spokes to show that even that number is feasible, although as generally constructed I use but eighteen—sometimes sixteen.

In Fig. 2, A, represents the rear, and B, the front section of the hub, provided with flanges C, C, through which, and through the tenons D of the spokes, so that each and every spoke shall be held thereby, are passed screw bolts *a*, *a*, *a* to firmly unite the whole. The inner faces of these two sections A, B, are countersunk from an eighth to a quarter of an inch to receive the ends *c*, *c*, of a thin metallic tube or ring E, against which the inner ends of the spokes D, rest and are firmly supported. This separate and independent thin tube or ring forms the connection between the two sections, and always remains in its place, while either or both of the sections may be removed and replaced at any time without detriment to the wheels, as the ring always affords an inner support to the spokes. The interior of this ring, is larger than the bore of the hub, which admits of its being used as an oil reservoir, and besides this it throws the bearings upon the point and heel of the axle journal, where it should be, by removing any possibility of a central bearing.

d, *d*, represent washers which may be used if deemed advisable, but I prefer laying the tenons of the spokes in white lead and oil, or other similar mixture, to protect them from moisture, and more especially to prevent the oil or grease from the inside of the hub, from working into them, which would soften and cause them to get loose in the hub.

While the inside of the ring is enlarged for the purposes above described, it will be perceived that I still retain a length of spoke within the hub, greater in proportion to the diameter of the hub, than can be found on any of the wheels which I have seen.

This particular construction of the hub, give it great strength and lightness, but the facility with which a new spoke can be introduced without cutting or removing the tire, is one of its most essential features. By reference to Fig. 3, it will be seen that owing to the "dish" of the wheel a spoke can only be put in from the back of the wheel—the side or edge *y* of the spoke is longer than that *x*, and consequently the long side *y*, must come to its bearing last; or, in other words, to drive the spoke any farther than until its long side comes to its bearing, or in contact with the ring, would be to loosen it. It is obvious that the spoke must go in, in the direction of the red line (Fig. 3) from the back of the wheel. If introduced the other way, the end must be so cut away to get it in, as that it will not bear upon the tube or ring when in its place, except perhaps at one point. For this reason, I assert that in Mansfield's patent a spoke cannot be introduced in a workmanlike manner. The removal of the back section and the tube with it, (as seen in Fig. 3) admits of the spoke being held and driven into the felly, in its exact radial direction or position, and when driven endwise into the felly until the shoulder comes up to the felly, it is then driven downward at the rear into its position, and during this downward driving the spoke has an end bearing at each end, and when in its seat, is as firm there as though it was originally formed into the wheel when first constructed. If the pipe or tube were a part of the front section, and protruded upward as it would do, after the back section was removed, the spoke to be introduced would have to be forced to one side of said tube and in that forced position driven into the felly, which must of course weaken the tenon in the felly, or make a bad connection, either of which are equally fatal to the wheel.

Having thus fully described the nature of my invention and clearly shown wherein it differs from those wheels and hubs most like it in appearance, I would state that, I do not claim a hub, the central portion of which is provided with mortises or recesses for the reception of the spokes, as I deem such a hub impracticable from its very nature, as it limits the number of spokes in the hub or wheel to less than are actually necessary. Nor do I claim a hub composed of concentric rings of alternate iron and rubber, with the spokes abutting against the outer ring, which would so enlarge the hub as to make it useless for my purpose. But

What I do claim as new and desire to secure by Letters Patent is—

A hub composed of a back and front section A, B, and having a thin metallic tube or ring E, independent of each, centrally placed between them, against which the inner ends of the spokes abut, when said sections are so made as that in removing the back one A, the pipe or box of the hub, shall also be removed or removable with it, to facilitate the properly introducing of a new spoke, substantially as described.

HENRY NYCUM.

Witnesses:
A. B. STOUGHTON,
THOMAS UPPERMAN.