2 Sheets—Sheet 1.

L. WILLIAMS.

MACHINE FOR BORING HUBS AND FELLIES.

No. 174,994. Patented March 21, 1876.

Fig 1.

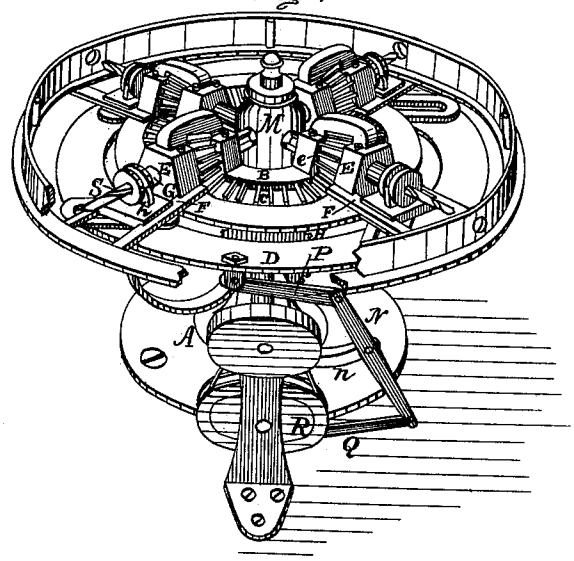
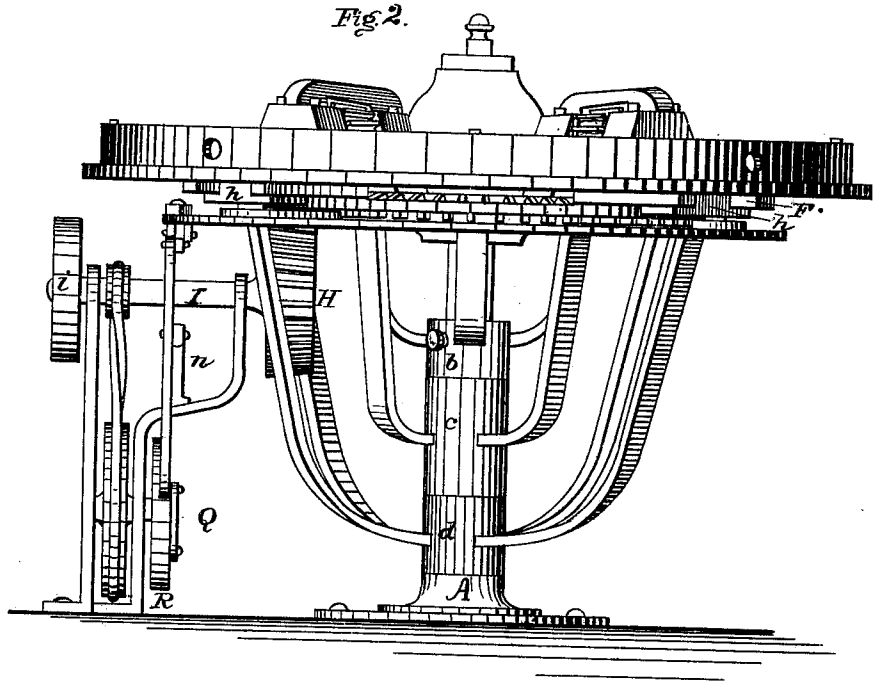


Fig 2.



Witnesses:
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C. Clarence Poole

Inventor:
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2 Sheets—Sheet 2.

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Fig. 3.

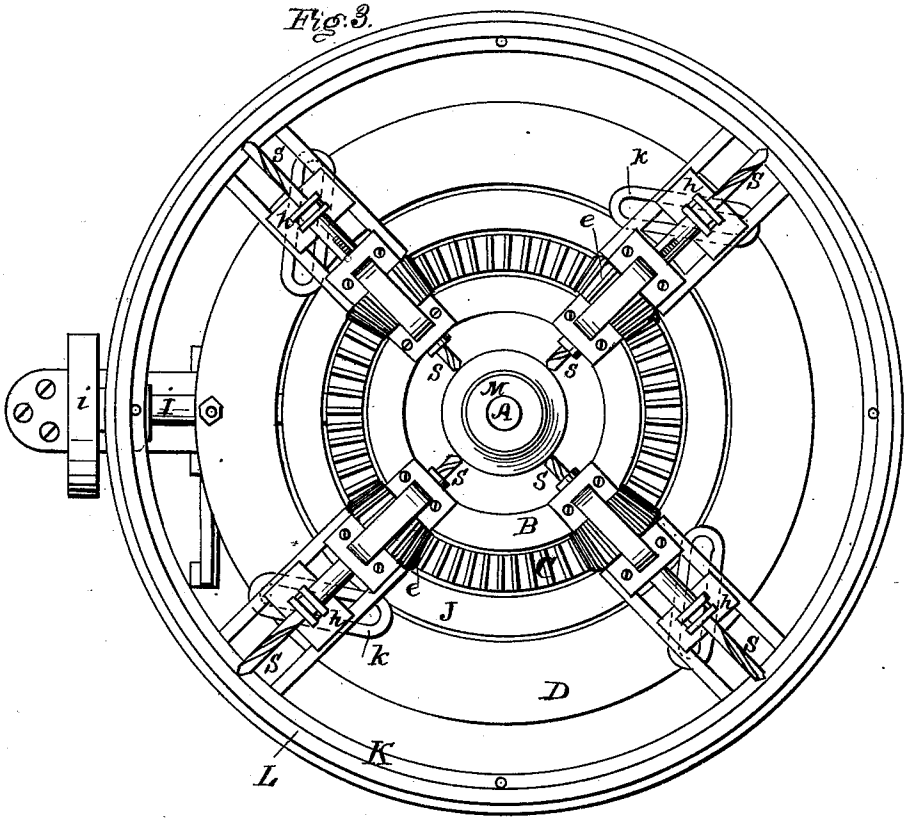
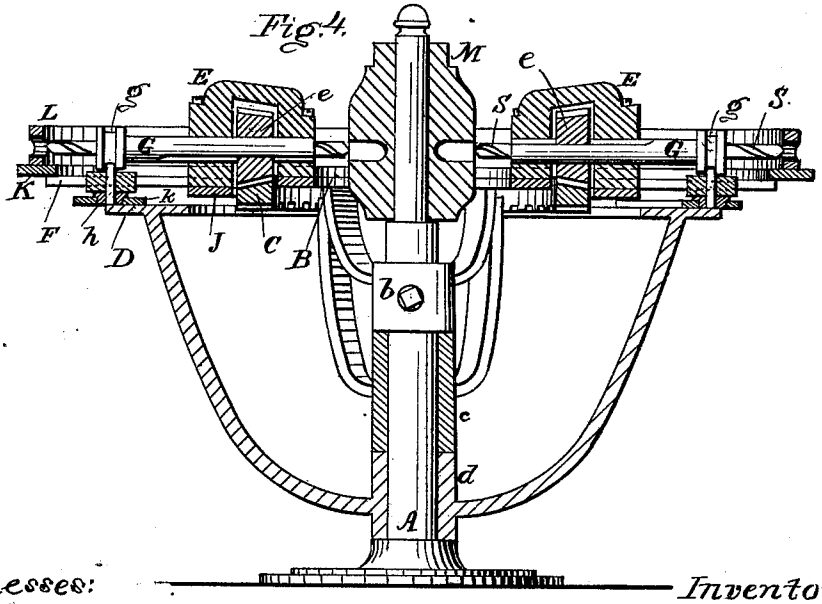


Fig. 4.



Witnesses:
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C. Clarence Poole

Inventor:
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UNITED STATES PATENT OFFICE.

LORENZO WILLIAMS, OF MILWAUKEE, WISCONSIN.

IMPROVEMENT IN MACHINES FOR BORING HUBS AND FELLIES.

Specification forming part of Letters Patent No. **174,994**, dated March 21, 1876; application filed December 1, 1875.

To all whom it may concern:

Be it known that I, LORENZO WILLIAMS, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Machine for Boring Hubs and Fellies, which improvement is fully set forth in the following specification.

The object of this invention is to bore the sockets for the spokes in both hub and felly at a single operation, and exactly opposite to each other. It is more particularly designed for use in the manufacture of wheels for children's carriages, but is applicable to wheels of any size if the machine be constructed of proper capacity; and it consists, first, in a circular frame having a center mandrel for the hub and outer clamps for the felly, and radial guides for a suitable number of auger-carriages which are alternately and automatically moved back and forth in a radial direction, so that the sockets in the hubs are bored during one movement, and the sockets in the felly are bored during the opposite movement; second, in a continuously revolving rack, which meshes with and drives the pinions on the boring-bit stocks, and in an oscillating circular frame with diagonal slots or cams to move the bit-stocks back and forth in a radial direction.

That others may fully understand my invention, I will more particularly describe it, having reference to the accompanying drawing, in which—

Figure 1 is a perspective view of my apparatus in operative condition. Fig. 2 is a side elevation of the same. Fig. 3 is a plan view of the same. Fig. 4 is a vertical central section of the same.

A is a strong column and base, made of cast-iron or other suitable material, which is securely bolted to the floor or supporting-table. This column supports a series of concentric rings by means of arms springing from sleeves or hubs fitted upon said column. The innermost of these rings is B, and its hub *b* is secured to the shaft A by a set-screw. The rings C and D are supported upon similar arms springing from rotating hubs *c d* placed upon the shaft A, below the hub *b*.

The ring B has securely bolted to its upper surface the yokes E, and the guide-rods F F, which are parallel to each other and to a line radial to the center of the shaft A. The yoke E spans and holds the pinion *e*, through the center of which the sliding bit-stock G passes, provided with spline and feathers, so that they are rotated by said pinions. The bearings for said bit-stocks are in the ends of the yoke E. The pinion *e* meshes with the bevel-gear teeth upon the ring C, which is provided with similar gear-teeth on its under side to mesh and gear with a driving-pinion, H, upon the inner end of the shaft I, which is operated by a pulley, *i*, or some other proper device for transmitting motion.

The inner ends of the guide-rods F are secured to the ring J, which is supported by the outer end of the yokes E E, and the outer ends of said guide-rods are attached to and support the felly-ring K, upon which the felly L rests while the spoke-sockets are being bored.

The hub M to be bored is placed on the upper end of the shaft A. One end of each bit-stock is provided with a grooved flange, *g*, and a fork or shipper-slide, *h*, which moves on the guide-rods F, engages in said groove and controls the endwise movements of the bit-stocks G. From the lower side of the shipper-slide a pin projects downward and engages with an oblique slot or cam, *k*, on the upper surface of the oscillating ring D, so that as said ring is oscillated the bit-stocks will be caused to slide endwise through the pinions *e*, and approach or recede from the center, as the case may be.

An oscillating movement of the ring D may be produced in a variety of ways, but I prefer to produce it by a vibrating lever, N, pivoted to a stationary arm, *n*, and coupled to said ring by a connecting-rod, P. Said lever is driven by a crank-rod, Q, which takes its motion from the shaft I, through a crank-wheel, R, or other convenient arrangement.

The bit-stock G has a boring bit or auger, S, at each end, and these bits are rotated by the continuous revolution of the ring C, driven by the shaft I and pinion H. At the same time the ring D is oscillated, and the bits are alternately driven into the hub M, and into

the felly L, and the spoke-sockets, therefore, are always exactly opposite, and are bored by a single continuous motion of the driving-power.

Any required number of yokes and bit-stocks may be arranged on this frame, so that the sockets will all be simultaneously bored in the hub and then in the felly; or a lesser number, as shown in the drawing, may be arranged, and the hub and felly alternately shifted—the hub while the felly is being bored, and vice versa.

If the machine is used in the last-named way, suitable gages may be employed to regulate exactly and uniformly the distance through which the blank should be moved.

Having described my invention, what I claim as new is—

1. The central shaft A, and the stationary rings B J K, combined with radial bit-stocks G, arranged between the center and the periphery bearing-bits at each end, and their pinions *e* simultaneously revolved by a continuously rotating gear-ring, C, and an oscillating cam-ring, D, to feed said bit-stocks alternately toward and from the center, or the equivalents for these devices, substantially for the purpose set forth.

2. The stationary ring B, yoke E, guides F, and ring K, combined with the pinion *e*, bit-stocks G, arranged between the center and periphery, which slide through and are rotated by said pinions, provided with the groove *g* and shipper *h*, which moves on said guides F.

3. The sliding shipper *h*, oscillating or reciprocating cam-frame K, whereby the bit-stock carriage is moved along the guides F, combined with the vibrating lever N, and crank-wheel R, actuated by the driving power, substantially as set forth.

4. The several rings, B C D, supported upon arms springing from the several hubs, *b c d*, all mounted upon and combined with the single central shaft A, the base of which is secured to the floor or supporting-table, and the top of which receives the hub to be bored.

LORENZO WILLIAMS.

Witnesses:

ADOLPH MEINECKE,

PH. HAYDEN.