2 Sheets—Sheet 1.

J. KRITCH.

Hub-Boring Machine.

No. 201,350. Patented March 19, 1878.

Fig. 1.

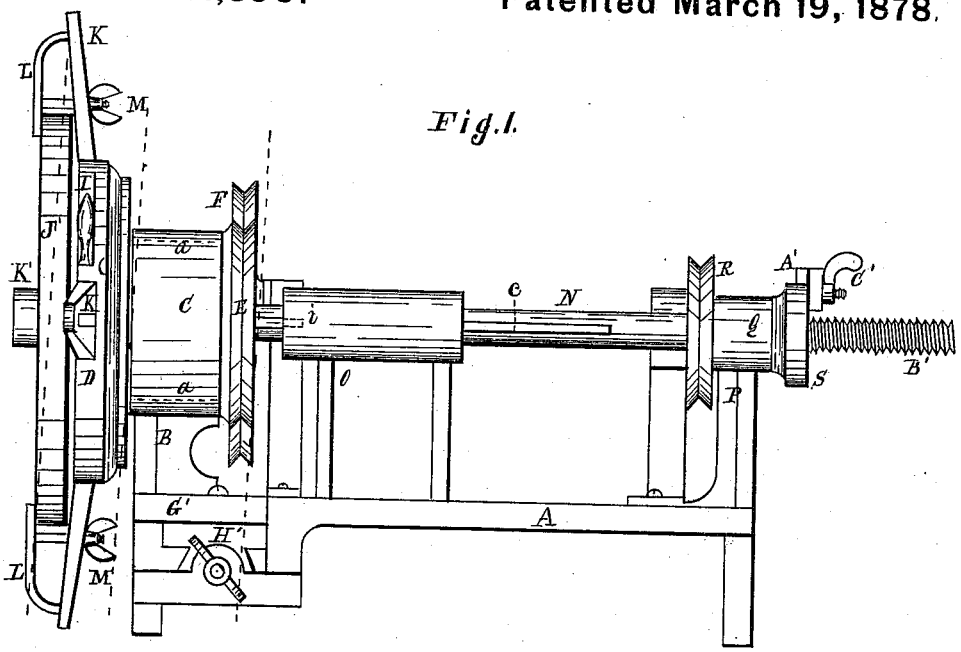
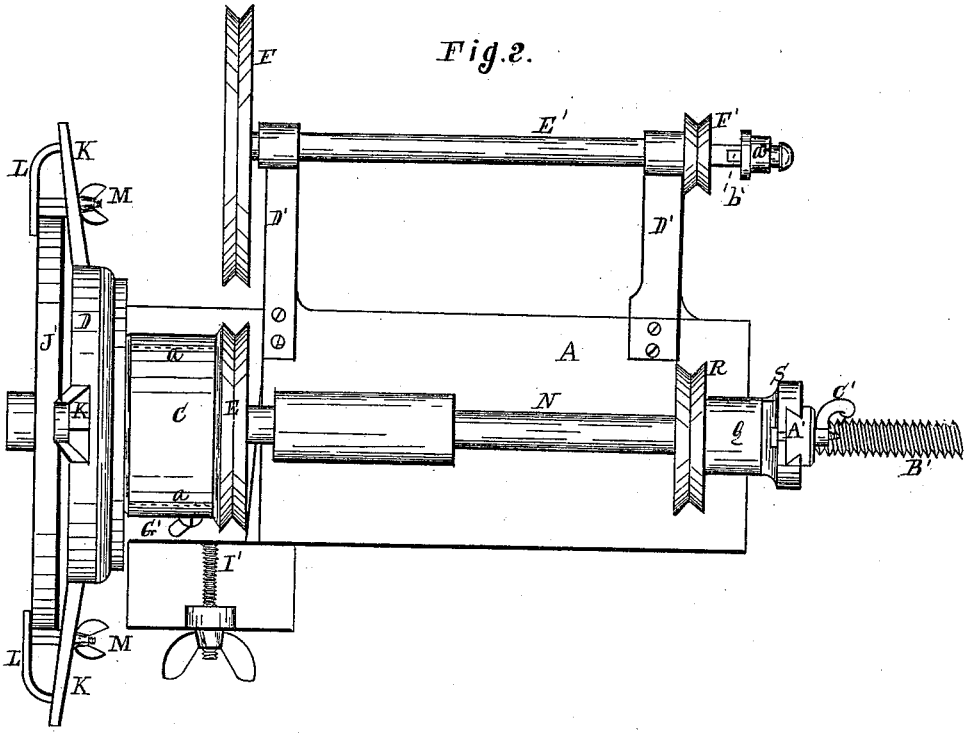


Fig. 2.



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2 Sheets—Sheet 2.

J. KRITCH.

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No. 201,350. Patented March 19, 1878.

Fig. 3.

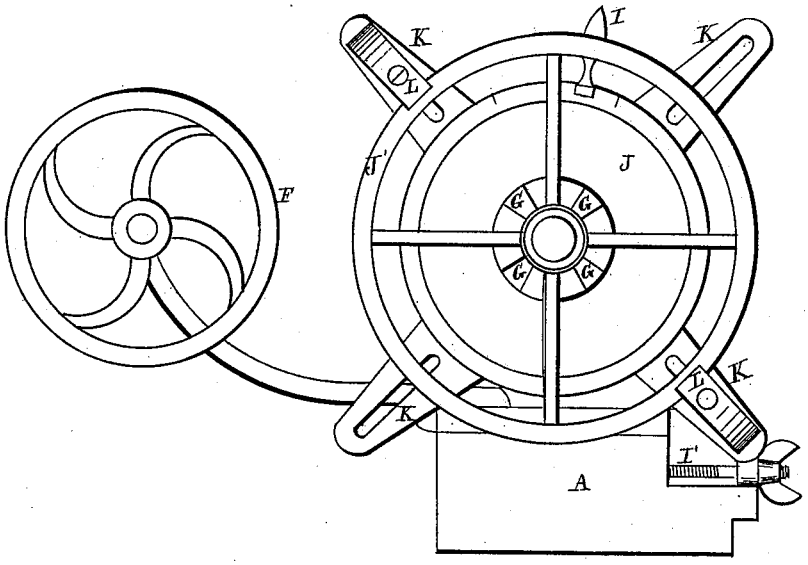


Fig. 4.

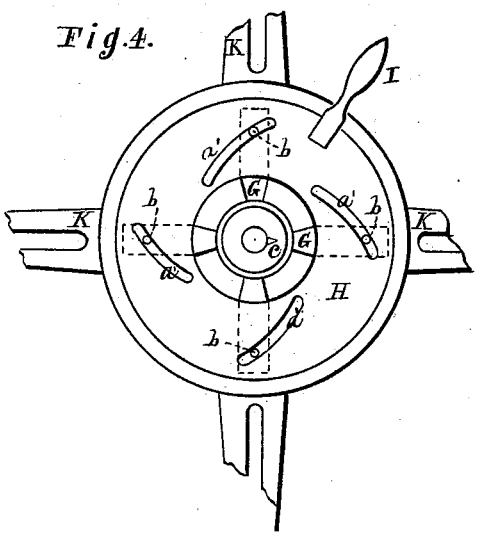
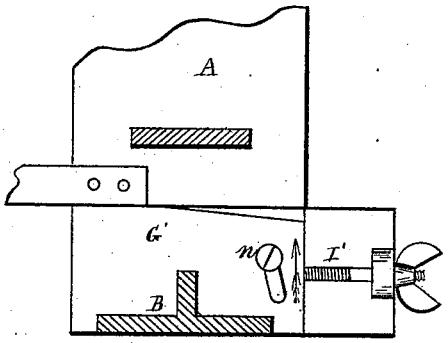


Fig. 5.



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UNITED STATES PATENT OFFICE.

JACOB KRITCH, OF CLEVELAND, OHIO.

IMPROVEMENT IN HUB-BORING MACHINES.

Specification forming part of Letters Patent No. **201,350**, dated March 19, 1878; application filed December 20, 1877.

To all whom it may concern:

Be it known that I, JACOB KRITCH, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Machines for Boring Carriage-Wheel Hubs, of which the following is a description, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side elevation of the machine. Fig. 2 is a plan view. Fig. 3 is a front elevation. Figs. 4 and 5 are detached sections.

Like letters of reference refer to like parts in the several views.

This machine is for boring carriage-wheel hubs in order to fit therein the axle-box. Said machine consists of an adjustable revolving head, the face whereof forms a clamp, wherein the hub is held by radial slides concentrated upon the hub by a revolving slotted plate or ring. Into the slots of said ring project pins or studs from the slides, and which are operated thereby for centering said hub and holding the same while being bored.

A more full and complete description of the machine is as follows:

In the drawing, A represents a frame, upon which is supported, on a standard, B, Fig. 1, a collar, C. In said collar is fitted, so as to revolve therein, the neck or journal of the head D. Said neck is indicated by the dotted lines *a*. In the inner end of the neck is a band-wheel, E, whereby the head D alluded to is revolved by a band from the wheel F. Within the head referred to are radial slides G, Fig. 4, lying, respectively, in corresponding grooves or ways, wherein they are retained by a revolving plate or ring, H, in which are slots *a'*, holding the pins or studs *b* of the slides, respectively, as shown in the said Fig. 4.

The ring H is revolved by a handle, I, for operating the several slides by means of the slots and pins alluded to. The ring H is retained within the head by a face-plate, J, Fig. 3. From the periphery of the head D project slotted radial arms K, to which are secured clamps L by thumb-screws M, Fig. 1. The purpose of said arms and clamps will presently be shown.

N is the boring-bar, supported centrally in relation to the head D, above described, by the standards O and P, through the heads of which the bar passes, and which is prevented from turning therein by a feather, *i*, sliding in the groove *c*, Fig. 1, made lengthwise in the bar.

The rear end of the boring-bar passes loosely through a bush fitted in the head Q of standard P, so as to revolve freely therein. On one end of said bush is a pulley or band-wheel, R, and on the opposite end a collar, S. In said collar is a slide, A', dovetailed therein, as shown in Fig. 2. The lower end of said slide is a segment of a nut, of a pitch to fit the feed-screw B', terminating the end of the boring-bar, with which it is made to engage, and is secured in such engagement by a thumb-screw, C'. Journaled in the ends of the brackets D' is a shaft, E', Fig. 2, carrying the wheel F on one end, and a smaller wheel, F', on the other. Said wheels are, respectively, in line with the wheels E and R, and to which they are to be connected by bands. The purpose of the said wheels will hereinafter be shown.

The standard B, above referred to, is secured to a base, G', Fig. 2. Said base is pivoted to a slide, H', so that it may be horizontally partially rotated, and, by the slide to which it is pivoted, moved laterally by the adjusting-screw I'.

Having described the construction and arrangement of the several parts of the machine, the practical operation of the same is as follows:

The wheel of which the hub is to be bored is secured to the face of the head, as shown in Figs. 2 and 3, in which J' represents the felly of the wheel, and K' the hub. Said hub, as will be seen, is clamped between the ends of the slides G, which are moved simultaneously upon the hub by the handle I, whereby is operated the slotted ring or plate H, above described, which, as aforesaid, actuates the slides.

The hub thus clamped by the several slides is centrically held in position, and further secured to the head by the clamps L, which bind the rim of the wheel firmly to the arms K of the head, as shown in Figs. 1 and 3. The wheel, when thus secured to the head, is

now ready for being bored, and which is accomplished as follows: In the end of the boring-rod N is a cutter, *c*, Fig. 4. The taper to be given the hole in the hub is made by turning the head more or less from a right angle in respect to the boring-bar, thereby placing the hub of the wheel in such an oblique relation to the bar that it will bore a tapering hole. This oblique position of the hub is effected by turning the base G′, supporting the head, which, as above said, is pivoted to the slide H′. The set-screw *n*, Fig. 5, is loosened for that purpose. The base is then moved more or less obliquely, as the taper for the axle-box may require. The head D and the wheel are revolved by a band from the wheel F, passing around the wheel E. As the head and wheel revolve, the cutter is made to approach the hub laterally, for cutting, by the slide H′, actuated by the screw I′. At the same time the cutter is fed forward by the screw B′ and segment-nut or slide A′, which, at this time, engages the screw, and which engagement is secured by the nut and screw C′. Said nut is revolved, for moving forward the boring-bar, by the wheel R, over which a band passes from the wheel F′ on the shaft E′.

By the above-described arrangement of devices, the hub is bored a true taper for the axle-box. Thus, as the wheel revolves, the cutter bores and rounds up the hole, and at the same time the cutter is fed forward by the feed-screw B′. The cutter, on being passed through the hub, is then drawn back by disengaging the slide-nut H′ from the screw, which will allow the screw or boring-bar to be drawn back through the hub and collar R and S.

The bar, as before said, is prevented from turning by a feather (indicated by the dotted line *i*, Fig. 1) moving in the groove *c*, alluded to.

To stop the revolving movement of the wheel and collar R S, so that the slide or nut A′ can be disengaged from the screw, the wheel F′ is disengaged from the shaft, so that it may revolve thereon and not with said shaft; hence no motion is conveyed from the wheel F′ by the band to the wheel R, which, therefore, remains still, so that the slide or nut H′ may be moved back from the screw, for withdrawing the bar from the hub, as aforesaid.

The wheel F′, above referred to, is secured to the shaft E′ by a collar or clutch, a^2, Fig. 2, feathered to the shaft, so that it may revolve therewith, and at the same time be free to slide thereon. Projecting from the side of the collar is a lug, b^1, which, on pushing forward said collar, said lug enters a hole or notch in the side of the wheel, thereby clutching the wheel to the shaft, that it may revolve therewith. On withdrawing the lug from the wheel, said wheel is free to revolve on the shaft, or to remain still while the shaft revolves, for the purpose specified.

In using the above-described machine, no special care is required to set the wheel so that it shall be exactly central for boring the hub, for the reason that the radial slides, moving simultaneously and equally together, clamp the hub centrally in respect to the boring-bar; hence but little time is required to set the wheel for boring the hub.

The position of the base G′, as shown in Fig. 5, is such as will bore a straight hole in the hub. The base, however, can be adjusted for boring a tapering hole by moving it in the direction of the arrow. This oblique adjustment of the base is on one side of its pivotal pin or bolt only.

The transverse adjustment of the head by means of the slide H′, referred to, enables the machine to bore a large or small hub, as the size of the box may require; also, it enables the operator to cut a recess in the hub at the ends of the spokes, so that the tenons shall have no bearing on the box, but shall be supported on the shoulders of the tenons and the surface of the hub.

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

1. In combination with the non-revolving boring-bar N, provided with a screw, B′, the wheel R, collar S, sliding segmental nut A′, and set-screw and nut C′, substantially in the manner as described, and for the purpose set forth.

2. In combination with the obliquely-adjustable standard B, the transversely-adjustable slide H′, and screw I′, in the manner substantially as described, and for the purpose specified.

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