2 Sheets, Sheet 1.

L. A. Dole,

Boring Hubs.

No. 53,216. Patented Mar. 13, 1866.

Fig. 1.

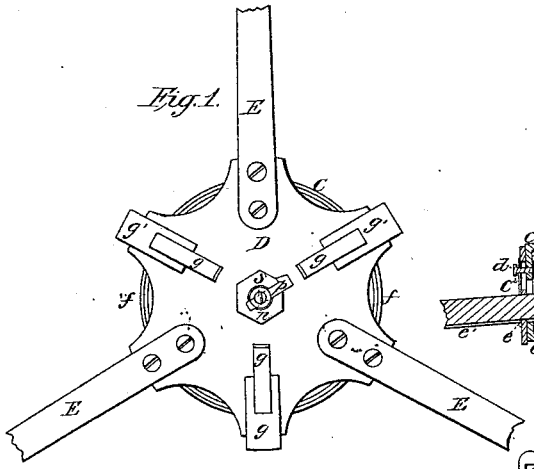


Fig. 2.

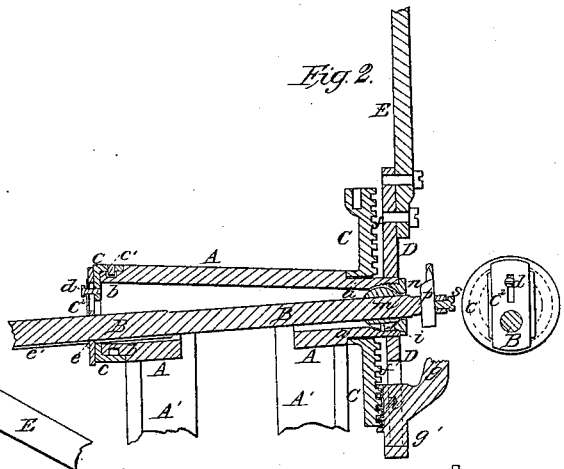


Fig. 3.

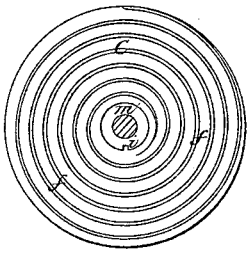


Fig. 4.

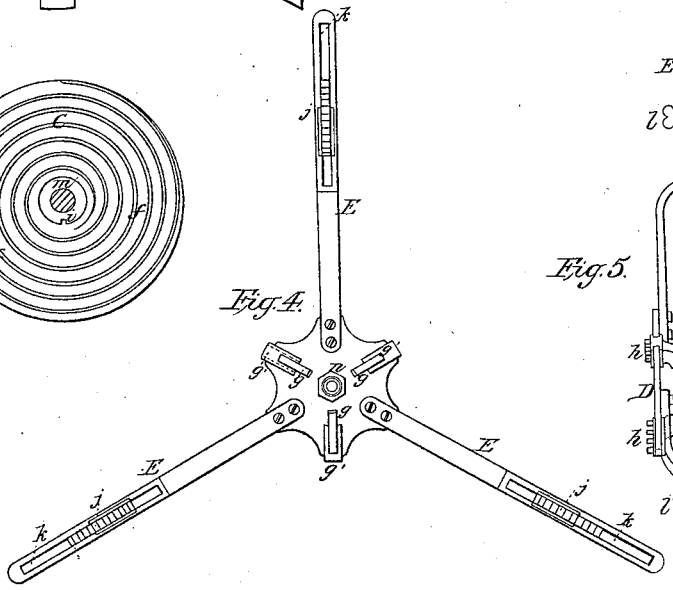
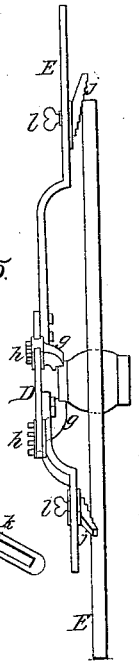


Fig. 5.



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C. Schaefer

Inventor:
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by his Attys
Mason, Fenwick & Lawrence

2 Sheets. Sheet 2.

L. A. Dole,

Boring Hubs.

No. 53,216. Patented Mar. 13, 1866.

Fig. 7.

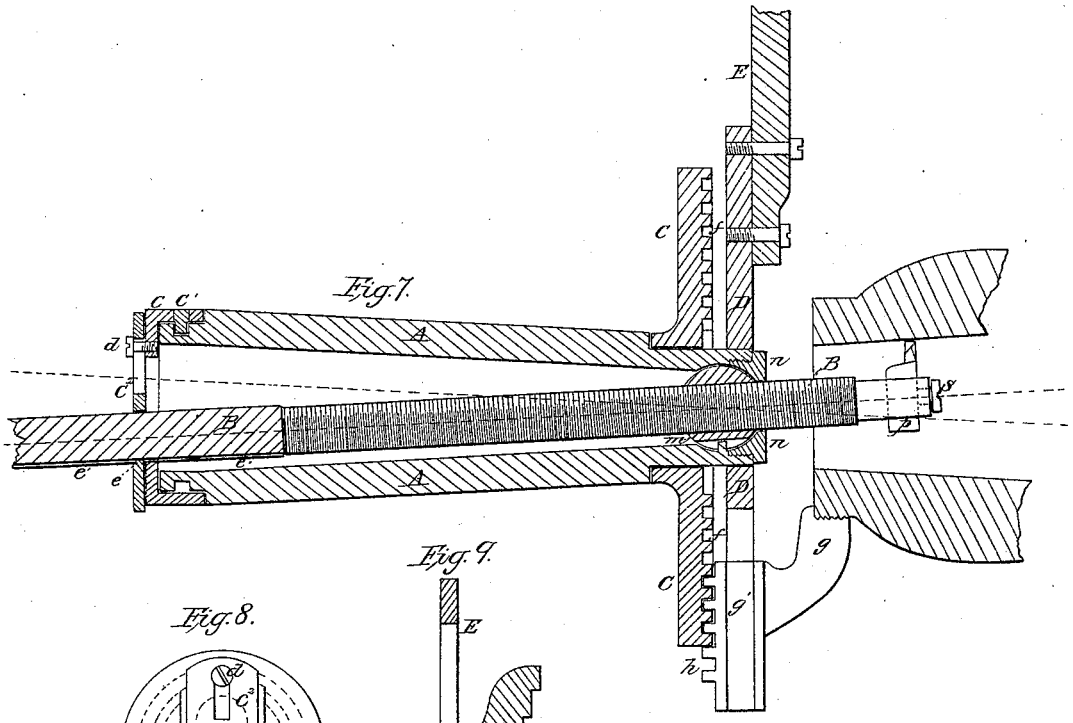


Fig. 8.

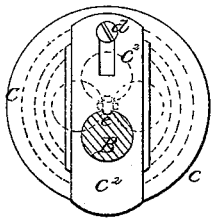


Fig. 9.

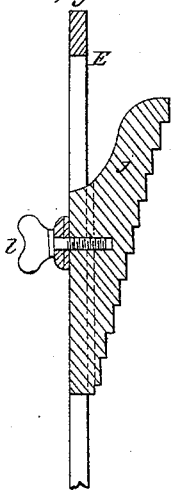
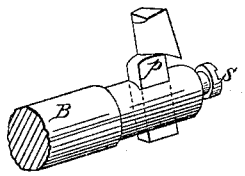


Fig. 10.



Witnesses:
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Inventor.
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by his Attys
Mason Fenwick & Lawrence

UNITED STATES PATENT OFFICE.

L. A. DOLE, OF SALEM, OHIO, ASSIGNOR TO HIMSELF AND A. R. SILVER, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR BORING HUBS.

Specification forming part of Letters Patent No. **53,216**, dated March 13, 1866.

To all whom it may concern:

Be it known that I, L. A. DOLE, of Salem, in the county of Columbiana and State of Ohio, have invented a new and Improved Machine for Boring Hubs; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1, Sheet 1, is a front view of the chuck and boring-tool combined. Fig. 2, Sheet 1, is a longitudinal central section taken in a vertical plane through the machine. Fig. 3, Sheet 1, is a face view of the scroll-disk for adjusting the sliding dogs of the chuck-plate. Fig. 4, Sheet 1, is a front view of the chuck and its arms for supporting the rim of the wheel. Fig. 5 is a side elevation of Fig. 4. Fig. 6 is an end view, showing the adjustable bearing for the auger-shaft and its turning collar. Fig. 7, Sheet 2, is an enlarged diametrical section of the machine with the arms of the chuck-plate broken off. Fig. 8, Sheet 2, is an enlarged view of Fig. 6. Fig. 9, Sheet 2, shows one of the adjustable stepped bearings of the arms of the chuck-plate. Fig. 10 is a perspective view of the boring-tool applied to its shaft.

Similar letters of reference indicate corresponding parts in all the figures.

This invention relates to certain novel improvements on machines for boring tapering holes through the hubs of wheels, wherein centering-chucks are employed in conjunction with contrivances for adjusting the auger-shaft and giving to it any desired angle with respect to the axis of the hub when secured in place.

The main object of my invention is to employ a single chuck-plate on one side of a supporting-frame in conjunction with an adjustable support applied to the opposite side of such frame for setting the auger-shaft at any desired angle, so that the contrivances for centering, holding, and boring the hubs will all be sustained upon a frame during the operation of boring, as will be hereinafter described.

Another object of my invention is to provide for centering and securing wheels by their hubs, and also supporting them by their rims in a plane parallel to the chuck-plate for the purpose of boring tapering holes through the centers of the hubs, as will be hereinafter described.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

Previously to my invention machines for boring tapering holes through the hubs of wheels have been made with a contrivance for adjusting the auger-shaft out of a line coinciding with the axis of the hub, so that as the auger penetrated the hub it would bore a hole of gradually-increasing diameter, or a tapering hole. But the difficulty with such machines consists in not exactly centering the hubs with respect to the boring-tool, and also in preventing the hub and its wheel from vibrating or springing during the operation of boring. To remedy these and other objections to machines of this class which have been made, I employ a supporting-frame, A, which is mounted upon standards or legs A′, as shown in Fig. 2. The frame A consists of a shell having cylindrical bearings *a b* formed on its ends, which project beyond the bed-plate or table of said frame. The bearing *b* receives over it a cylindrical cap, *c*, through the collar or flange of which a pin, *c′*, passes and enters an annular groove which is formed in the bearing *b*, thus connecting the cap to the bearing and allowing this cap to be rotated backward or forward. Through the end of said cap an oblong slot is made, which is covered by a sliding plate, c^2, that extends diametrically across the cap and works between two parallel guides when the clamp-screw *d* is loosened. Through this slide c^2 the smooth portion B of the auger-shaft passes, and this auger-shaft is prevented from turning in said hole or bearing by means of a key-tenon, *e*, which is formed on slide c^2, and enters the longitudinal slot *e′* in the smooth portion of the auger-shaft, as shown in Figs. 2, 7, and 8.

On the opposite end of the frame or hollow shell A I apply the contrivances for centering the hubs and securing them rigidly in place.

C represents a circular plate which turns loosely upon the tubular bearing *a*, and which is constructed with a volute or scroll flange, *f*, on one face, as clearly shown in Fig. 3. In

front of this disk C, and keyed to the bearing *a*, is a plate, D, which is adapted for receiving and supporting the three sliding dogs *g g g*, which are all moved toward or from the center of the plate D simultaneously by turning the disk C, the volute-flange of which engages with the teeth *h*, which are formed on the slides *g' g' g'* of the dogs *g*, as shown in Figs. 2 and 7. The biting ends of said dogs are all equidistant from the center of the plate D, and when they are brought up against the cylindrical portion of a hub they not only center the hub, but confine it rigidly in place, so that when thus confined its axis will coincide with the axis of the shell A, rotary disk C, and chuck-plate D, as shown in Fig. 7.

E E E are radial arms, which are secured at regular distances apart to the plate D, as shown in Fig. 4, and which are provided with stepped blocks or bearings *j j j*, that are fitted in slots *k k k* of said arms. Set-screws *l* are employed for clamping the blocks *j* to the arms at any desired point, according to the diameter of the wheels or the length of the hubs of the wheels which are to be bored.

The blocks *j* are stepped for the purpose of adapting them to different-sized wheels, so that the blocks will afford bearings for the rims of the wheels, and thus enable me to arrange and secure the wheels in a plane parallel to the plane of the chuck-plate D.

The auger-shaft B is supported at its forward end by a spherical nut, *m*, which is seated in a socket in the forward end of the shell A or the bearing *a* of this shell, as shown in Figs. 2, 3, and 7. This nut is kept in place by means of a tubular screw-cap, *n*, having a concave depression in one end, which is screwed into the end of the bearing *a*, and the nut *m* is prevented from turning about the axis of the auger-shaft, when this shaft is turned, by means of the fixed pin *i*. (Shown in Figs. 2, 3, and 7.) This nut *m* is, however, allowed to oscillate and accommodate itself to the motions of the auger-shaft when this shaft is adjusted for boring a tapering hole, as shown in Figs. 2 and 7. The auger-shaft has a screw formed on a portion of its length, which is intended for feeding the tool up to the work, the spherical bearing *m* serving as the nut for said portion of the shaft.

The cutting-tool is constructed, as shown in Fig. 10, with a shank, *p*, that passes diametrically through the end of the auger-shaft, and which has two cutting-edges formed on it and arranged at such an angle to each other that one cutter plows away the wood directly in front of the shaft B, while the other cuts out the chips and leaves the sides of the hole smooth. The shank of the cutters is confined in place by means of a set-screw, *s*, as clearly shown in Figs. 2 and 7. On the rear end of the auger-shaft a crank-handle, B', is applied, by means of which this shaft is turned.

My machine obviates the necessity of using a chuck-support at each end of the frame. It also obviates the necessity of having a hub-holder, which requires to be located forward of the cutting or boring tool. The distinguishing characteristic of my invention is the provision I have made in it for supporting both the hub-holder and boring-tool upon a single side of the frame A in such manner that the arrangement of the hub-holder forward of the cutter *p*, and so as to require an additional support or frame for it to be erected upon the bed-plate of the boring-tool frame, as in many machines is rendered wholly unnecessary, and thus great compactness and simplicity, with increased facility for manipulating the machine, are secured.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the fixed chuck-plate D, adjusting-plate C, hollow supporting-frame A, and the turning cap *c*, with its adjusting bearing-plate c^2, substantially as described.

2. The combination of the scroll-adjusting-plate C, chuck-plate D, oscillating-nut *m*, auger-shaft B, and adjustable bearing c^2, substantially as described.

3. The radial arms E, provided with adjustable sliding blocks *j j*, in combination with a centering-chuck and auger-shaft, substantially as described.

4. The stepped blocks *j*, when applied to radial arms E, and used substantially as described.

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Witnesses:
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WM. H. GARRIGUES.