(No Model.)

D. H. GOWING.

HUB BORING MACHINE.

No. 486,869. Patented Nov. 29, 1892.

Fig. 1

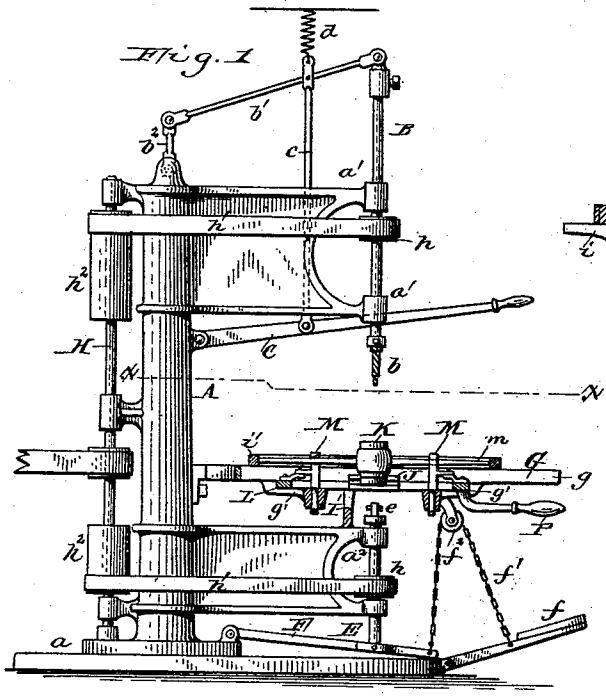


Fig. 3

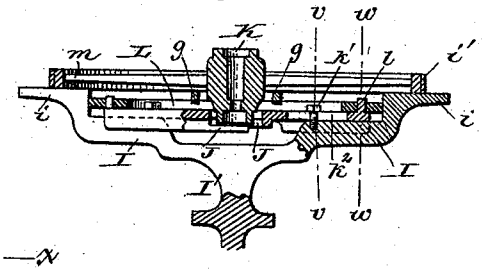


Fig. 4

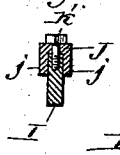


Fig. 5

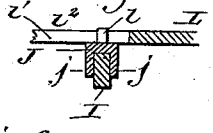


Fig. 6

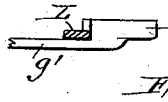


Fig. 7.

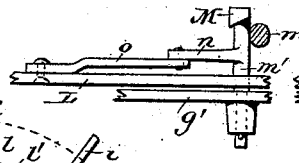


Fig. 8.

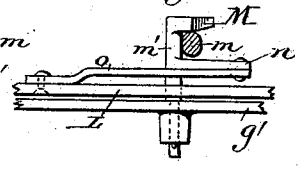


Fig. 2.

Fig. 9.

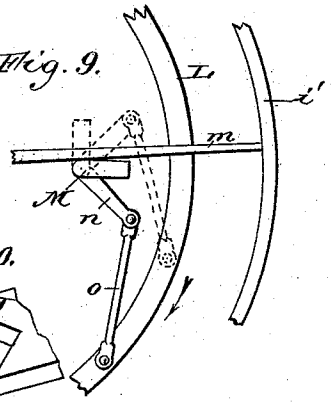
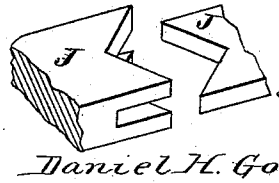


Fig. 10.



Witnesses:
Thos. L. Popp.
Jacob Nusenblatt

Daniel H. Gowing, Inventor.
By Edward Wichelns
Attorney

UNITED STATES PATENT OFFICE.

DANIEL H. GOWING, OF SYRACUSE, NEW YORK, ASSIGNOR TO HARVEY A. MOYER, OF SAME PLACE.

HUB-BORING MACHINE.

SPECIFICATION forming part of Letters Patent No. 486,869, dated November 29, 1892.

Application filed February 8, 1890. Serial No. 339,733. (No model.)

To all whom it may concern:

Be it known that I, DANIEL H. GOWING, a citizen of the United States, residing at Syracuse, in the county of Onondaga and State of New York, have invented a new and useful Improvement in Hub-Boring Machines, of which the following is a specification.

The object of this invention is to improve the means whereby the wheel is held against rotary and vertical movement on the wheel-supporting frame and whereby it is centered on the same.

In the accompanying drawings, Figure 1 is an elevation of a hub-boring machine, partly in section, provided with my improvements. Fig. 2 is a horizontal section in line *x x*, Fig. 1, on an enlarged scale. Fig. 3 is a transverse section of the hub-centering device in line *y y*, Fig. 2. Figs. 4 and 5 are vertical cross-sections in lines *v v* and *w w*, Fig. 3, respectively. Fig. 6 is a fragmentary sectional elevation in line *x x*, Fig. 2. Figs. 7 and 8 are fragmentary sectional elevations of the locking device for holding the wheel against rotary and vertical movement and showing the parts in two positions. Fig. 9 is a fragmentary top plan view of the locking device, showing the wheel in position to be locked. Fig. 10 is a perspective view of the faces of the centering-jaws.

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

A represents the vertical standard, secured to a base-plate *a* and provided on its front side with upper and lower bracket-bearings *a'* a^2, respectively.

B represents the upper boring-spindle, journaled in the bearings *a'* and provided at its lower end with a tool *b* for boring the hub from the upper side. The upper end of the boring-spindle B is connected with the upper end of the standard by jointed bars *b'* b^2.

C represents a hand-lever pivoted on the standard and connected with the jointed bar *b'* by a rod *c*, whereby the spindle B and its boring-tool can be moved vertically toward and from the hub. The upper spindle is normally held in an elevated position by a spring *d*, connecting the rod *c* with a suitable fixed object.

E represents the lower boring-spindle, journaled in the bearings a^2 and provided at its upper end with a tool *e* for boring the hub from its lower side.

F represents a lever pivoted to the lower end of the lower spindle and pivoted with its inner end to the base of the machine. The outer end of the lever F is connected with a treadle *f* by means of a chain *f'*, running over a pulley f^2 secured to the horizontal wheel-supporting frame G.

The upper and lower boring-spindles are provided with pulleys *h h*, which are driven by belts *h' h'*, running around pulleys h^2 h^2, mounted on a vertical driving-shaft H, journaled in bearings on the standard. The faces of the driving-pulleys h^2 h^2 are of sufficient width to permit the belts to travel freely up and down with the boring-spindles during the operation of boring the hub. I prefer to employ the aforesaid means for driving and operating the boring-tools, but any other suitable devices may be employed which permit the boring-tools to be actuated independently above and below the hub. The wheel-supporting frame G consists, essentially, of two horizontal arms *g g*, secured with their contiguous inner ends to the standard and diverging outwardly therefrom, and two transverse bars *g' g'*, secured horizontally to the under sides of the diverging arms *g g*.

I I represent two supporting-arms arranged transversely underneath the diverging arms *g* and secured to the upper side of the lower bracket-bearing a^2 by a shank I', as represented in Figs. 1 and 3. The outer ends of the transverse bars *g' g'* and of the supporting-arms I I are provided with radial brackets *i*, the upper sides of which are on a level and serve to support the rim *i'* of the wheel.

J J represent two V-shaped centering-jaws, which are adapted to move toward and from the center line of the supporting-frame and engage against opposite sides of the hub K, whereby the latter is centered preparatory to boring the same. One of the centering-jaws is preferably made bifurcated and the other jaw arranged in line with the recess in the face of the bifurcated jaw, as represented in Fig. 10, so that the solid jaw enters the recess of the bifurcated jaw as the jaws close upon the hub, thereby giving the jaws a better

bearing upon each other and upon the hub. The contracted shanks J′ of the jaws are supported on the arms I I and guided thereon by depending ribs *j j*, formed on the jaws. These ribs engage against opposite sides of each supporting-arm I and prevent lateral displacement of the jaws, while a bolt *k*′, secured to the supporting-arm and engaging in a slot k^2 in the jaw, prevents the latter from moving vertically.

L represents a horizontal ring supported on the transverse bars *g*′ *g*′. This ring is capable of rotary movement and adapted to move the centering-jaws radially toward and from the hub by means of pins *l l*, which engage in cam-slots *l*′ *l*′, formed in the enlarged portions l^2 on the ring. The ring L is held against lateral movement by the brackets *i i*, which engage with their inner shoulders against the outer side of the ring L and form an annular support therefor, as represented in Fig. 6.

M M represent turn or locking buttons which are adapted to engage over the spokes *m* of the wheel and hold the latter against upward movement during the operation of boring the hub. Each of the turn-buttons is provided with a vertical shank *m*′, which is pivoted vertically on the upper side of the transverse bar *g*′. The spokes *m* of the wheel rest against the sides of the shanks of the turn-buttons, whereby the wheel is held against rotary movement during the boring operation. The shank of each turn-button is provided with a laterally-extending arm *n*, the outer end of which is connected with the ring L by a link *o*, so that the turn-button is actuated by turning the ring.

P represents a handle secured to the ring, whereby the latter can be rotated and both centering-jaws and turn-buttons actuated simultaneously. Two or more turn-buttons may be employed, according to the size of the wheel.

The operation of centering a wheel preparatory to boring the hub is as follows: Before placing the wheel upon the supporting-frame the ring L is revolved in the direction of the arrow, as indicated in Fig. 9, whereby the centering-jaws are thrown apart and the turn-buttons assume a radial position. The wheel is then placed upon the supporting-frame so that its hub will come between the centering-jaws and two of its spokes will lie adjacent to the turn-buttons. The ring L is now turned so as to cause the jaws to advance from opposite sides toward the hub and center the same and the turn-buttons to be turned one-quarter of a revolution, which causes them to stand nearly at right angles to their former position and overlap the spokes of the wheel, as clearly shown in Figs. 2 and 8, whereby the wheel is held against vertical and rotary movement. The lower side of each turn-button is preferably inclined, as shown in Figs. 7 and 8, so as to permit the button to ride over the spokes and crowd them down if they exceed a certain thickness. If the hubs are of various diameters, the ring L and cams attached thereto will move varying distances; but this will not affect the function of the turn-buttons, as the latter can play fully one-quarter of a revolution and still overlap the spokes in order to hold the wheel against vertical movement when the lower boring spindle is in operation.

As shown in the drawings and described in the foregoing specification, the wheel holding and centering devices are applied to a machine employing vertical boring-spindles; but my improvement is also applicable to a horizontal hub-boring machine.

I claim as my invention—

1. The combination, with the wheel-supporting frame, of a set of turn-buttons mounted on said frame, centering-jaws also mounted on said frame, and connecting mechanism whereby the turn-buttons and the centering-jaws are actuated simultaneously, substantially as set forth.

2. The combination, with a wheel-supporting frame and a boring-tool, of centering-jaws adapted to move toward and from the hub, turn-buttons adapted to engage over the wheel, and a rotative ring connected with said turn-buttons and having cams connected with the centering-jaws, whereby both the turn-buttons and the centering-jaws are actuated simultaneously, substantially as set forth.

3. The combination, with a wheel-supporting frame, a boring-tool, and a centering device, of turn-buttons adapted to engage over the wheel-spokes and having shanks pivoted on said frame, arms formed on said shanks, and a rotative ring connected by rods with the arms of the turn-buttons, whereby the buttons are actuated, substantially as set forth.

Witness my hand this 5th day of February, 1890.

DANIEL H. GOWING.

Witnesses:
THEO. L. POPP,
CHESTER D. HOWE.