

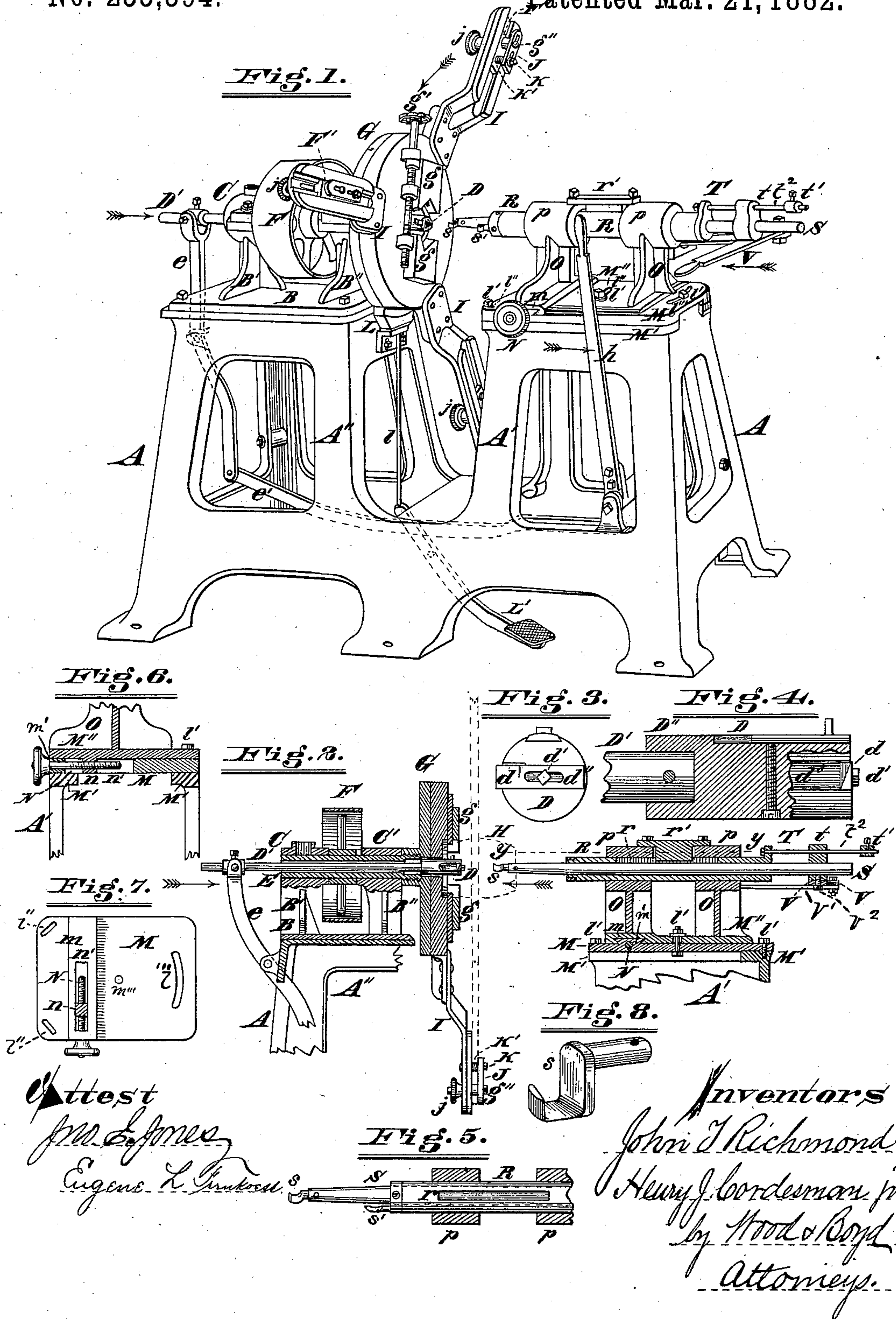
(No Model.)

J. T. RICHMOND & H. J. CORDESMAN, Jr.

WHEEL HUB BORING MACHINE.

No. 255,394.

Patented Mar. 21, 1882.



Attest
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UNITED STATES PATENT OFFICE.

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WHEEL-HUB-BORING MACHINE.

SPECIFICATION forming part of Letters Patent No. 255,394, dated March 21, 1882.

Application filed April 8, 1881. (No model.)

To all whom it may concern:

Be it known that we, JOHN T. RICHMOND and HENRY J. CORDESMAN, Jr., both citizens of the United States, of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Wheel-Hub-Boring Machines, of which the following is a specification.

Our invention consists of a new machine for boring and reaming out the hubs of wheels to receive the boxings, the several parts and features of which will be fully set forth in the description of the accompanying drawings, making a part of this specification.

In the accompanying drawings, Figure 1 is a perspective view of the machine embodying our invention. Fig. 2 is a central vertical section of our machine with the lower portion of the frame broken off. Fig. 3 is an end view of one of the cutter-heads. Fig. 4 is a broken sectional elevation of the same. Fig. 5 is a sectional plan of one of the cutters on line *yy*, Fig. 2. Fig. 6 is a vertical cross-section, showing the adjustability of the table. Fig. 7 is a plan view of the adjustable table. Fig. 8 is a detail perspective view of one of the cutters.

A represents the frame of our machine. Between the sectional parts A' A'' an open space is provided for the wheel and chuck to revolve in. The frame may be made of sectional parts and united together by bolts or otherwise, or it can be cast of one piece, as shown in the drawings.

B represents the bed or table for supporting some of the operative parts of the machine.

B' B'' represent pillars or posts, upon which are mounted tubular bearings C C'.

E represents a hollow shaft, revolving in the arbor-bearings C C'.

D' represents a shaft, lying within hollow shaft E.

D represents a cutter-head, rigidly attached to the shaft D' at its inner end.

F represents a driving-pulley, attached to the hollow shaft E.

G represents a revolving disk or chuck-head, which is rigidly secured to the driving-shaft E.

g g represent clamps, which are adjusted by

means of a right and-left-hand screw, *g'*, and they are located and adapted to clamp and hold the hub H of the wheel which is to be bored or reamed.

I I I represent bent arms, rigidly attached to the chuck-head G. The outer ends of these arms I are provided with ways, in which are placed sliding clamp-blocks J, which are secured in position by means of set-screws *j*, working on bolt *g''*. The lateral adjustment of the clamps J upon the arms I allows the clamps to be adjusted to fit different-sized wheels. The clamps J are adapted to clamp firmly the rim of the wheel, so as to hold it while the hub is being reamed. These arms I are bent so that their inner faces will be on the plane of the rim or felly of the wheel, as shown in Fig. 2. The clamp-blocks J are shown as slotted, so that they may be adjusted on blocks F' to regulate the amount of projection upon the rim of the wheel, and for convenience of removing the wheel without changing the position of the blocks F'.

K' represent spiral springs, which surround belts K and serve to keep the clamps J open for the easy removal of the wheel.

Other forms of clamps for engaging and holding the rims may be provided, instead of the particular form here shown.

D represents a cutter-head, which is formed of an open or slotted shaft, D''.

d represents a cutter-bit, which is secured to the end of the head D, which is grooved to receive the bit *d*. A screw-bolt, *d'*, passes through the slot *d''* in knife-bit *d*, which allows the lateral adjustment of the cutter *d* on the head, so as to regulate the size of the reaming. A groove, *d³*, is cut behind the knife, similar in shape to that of a common hand-plane, so as to allow the chips to clear. The use of this knife is to cut a circular groove in the outer end of the hub to receive the nut which holds the wheel onto the axle of the carriage. The shaft D' rests loosely in the hollow shaft E, and has lateral motion only, which motion is imparted to it by means of the compound levers *e*, *e'*, and *h*, so that the operator can by means of the pivoted hand-lever control the

feeding action of the knife *d* by moving shaft *D'* laterally to and from the hub of the wheel. The chuck *G* and wheel are rapidly revolved to bring the grain of the wood across the edge of non-revolving cutters, and it is necessary to stop the revolution of the chuck when the power is thrown off. To accomplish this a brake, *L*, is applied to the disk *G* of the revolving chuck. The brake *L* is operated by means of rod *l* and foot-treadle *L'*, which forms a powerful lever and quickly stops the motion of the machinery. It is essential to apply the brake to the disk of the edge or side of the chuck *G*, in order to stop the motion without injury to the revolving parts attached to the disk *G*.

M' indicates a bed, that is arranged upon the frame *A'*.

M refers to an adjustable table, which is held upon the said bed by means of bolts *V'*, passing through slots *l''*, which are arranged diagonally to the sides of the table, or, instead of these two slots arranged near the corners of the table, a single curved slot, *l'''*, can be employed, so as to allow the table in either instance to be circularly adjusted upon the bed.

M'' indicates a pillow-block, connected with the table by a tongue, *m'*, on the table, fitting in a dovetailed groove, *m*, in the under side of the pillow-block. This pillow-block can be adjusted laterally on the table by means of a screw, *N*, arranged to work through the tongue *m'* of the table, and also through a lug, *n*, projecting down from the under side of the pillow-block into a slot, *n'*, in the table, said adjustments of the table and pillow-block serving to secure the proper angle or taper of the cut and to determine the size of the hole.

O O represent pillars or posts for supporting sleeve-bearings *p p*.

R represents a hollow shaft supported in bearings *p p*, and it is adapted to slide laterally therein only. To prevent rotary motion of the shaft *R*, it is provided with slot *r*, in which is inserted a key, *r'*, which is provided with lugs through which pass screws, securing it rigidly to bearings *p p*. The parts form a feather to prevent rotary motion.

S represents a shaft resting within the hollow shaft *R*. The forward end of this shaft, *s*, cuts or reams the hole for boxing in hub *H*. The relative size of the shank to the knife *s* is important, as the end of the shaft next to the knife must be smaller in diameter than the hole cut by the knife, so as to allow the chips to readily clear. The increase in the size of the shaft back of the knife is simply to provide a strong shank. The shape of the knife is important, as it must cut not only the hub, but it must cut off the ends of the spokes, which are made to project through the hub. The knife *s* here shown is adapted for both reaming out the hole bored in the hub *H* when the wheel is made and for boring and reaming at once.

s' represents a secondary knife, which is made to ream a second hole larger than that

made by knife *s*, and it is securely attached to the laterally-moving hollow shaft *R*.

T represents regulating devices, provided with set-screws for adjusting the relation of shafts *R* and *S* so that each will, when moved up, cut the required depth of hole in the hub *H*. This device comprises a block, *t*, arranged upon the shaft *S*, and a lever, *V*, that is connected with said block by a set-screw, *V²*, that also holds said block on the shaft *S*. The lever is pivoted to a bar, *V'*, that is secured to one of the bearings *p*, whereby by operating said lever the shaft *S* can be moved back and forth. A rod, *t²*, connected with the hollow shaft *R*, passes through block *t*, and is provided with an adjustable collar, *t'*, so that by adjusting a nut upon that end of the rod *t²* that passes through a lug on the end of shaft *R* said shaft can be adjusted, or it can be moved by operating the lever so that the block *t* will strike against the collar *t'*.

It is obvious that knife *s'* may be omitted and still not affect our invention so far as the operation of knife *s* is concerned; but we consider this an additional feature of our invention.

The hub-clamps *g g'* may in some cases be dispensed with and only the clamp *J* be employed; but the use of the hub-clamps *g g'* is a great advantage, as the wheel can at once be accurately centered on the chuck by their employment, and their combination with the wheel-chuck *G* and bent clamp-arms *I* is one feature of our invention.

The frames *A' A''* may be made separate, and of wood or of iron, as desired.

A great many advantages result from the use of our machine. The wheel-hub can be bored or reamed from both sides by means of the two non-revolving laterally-moving knives at one chucking of the wheel by a successive operation of the two handles *h V*.

By the use of all the knives the fitting of the hub to receive the boxes, nut, and washer can be rapidly accomplished.

We do not mean to confine ourselves to the use of the various details of adjusting devices and the incidental features of our machine, as they may be variously modified without affecting the principal and leading feature of our invention.

We claim—

1. A wheel-hub-boring machine composed essentially of a duplex bed or table, *A' A''*, a revolving wheel-chuck mounted on a hollow revolving shaft supported in bearings on one of the said tables and revolving in an open space between the tables, a longitudinally-moving non-revolving shaft supported within said revolving shaft and armed with a cutter, and a second longitudinally-moving non-revolving shaft and cutter mounted upon the opposite table, both of said cutter-shafts being operated endwise by suitable actuating-levers at one end of the machine, whereby the revolving hub is adapted to be bored from its opposite sides by the longitudinally-moving knives, substantially as described.

2. The combination, with the cutting-knife, of the rotary wheel-chuck consisting of the wheel carrying the hub-clamps adjusted by a right-and-left screw, and the bent radial arms I with the adjustable clamps, substantially as described.

3. The combination, in a wheel-hub-boring machine, of the wheel-chuck mounted upon a hollow rotary shaft, the cutter-shaft D', arranged to be moved through the said hollow shaft, and the levers *e e'* and hand-lever *h*, all arranged to effect such movement of the knife-shaft, substantially as described.

4. The combination of the shaft S and the knife *s* with the hollow shaft R, the lever V, connected with a block secured upon the said shaft carrying the knife, and an adjustable

connection between said block and the tubular shaft, the lever being pivoted to a bar secured to one of the bearings *p*, substantially as described.

5. The combination of the hollow shaft R and its contained shaft S, carrying cutters *s s'*, with the adjusting devices T and lever V, for the simultaneous operation of the cutters *s s'*, substantially as herein set forth.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

JOHN T. RICHMOND.

HENRY J. CORDESMAN, JR.

Witnesses:

J. H. CHARLES SMITH,

THOMAS P. EGAN.