(No Model.) 2 Sheets—Sheet 1.

E. CASWELL.

HUB BORING MACHINE.

No. 282,495. Patented Aug. 7, 1883.

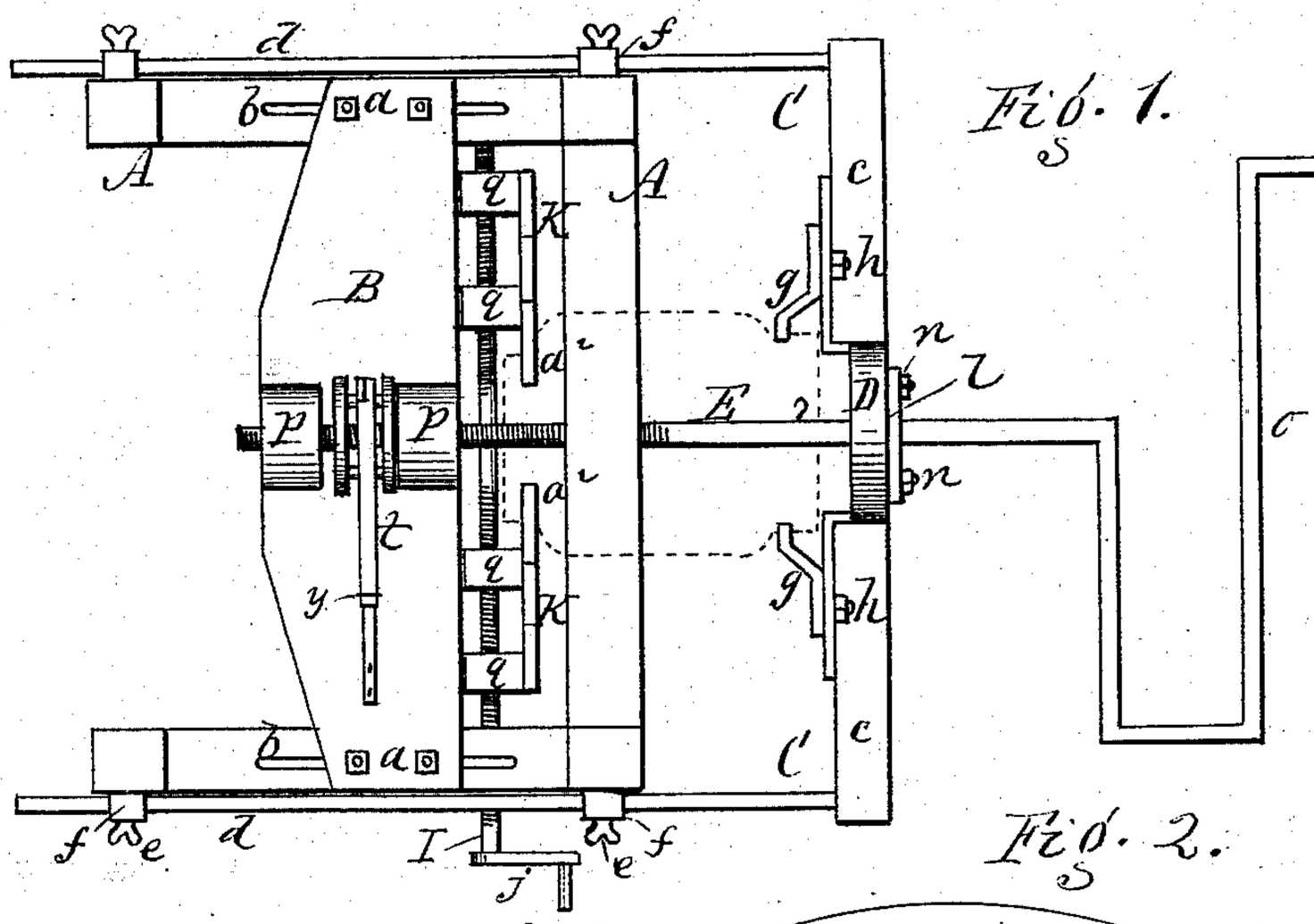
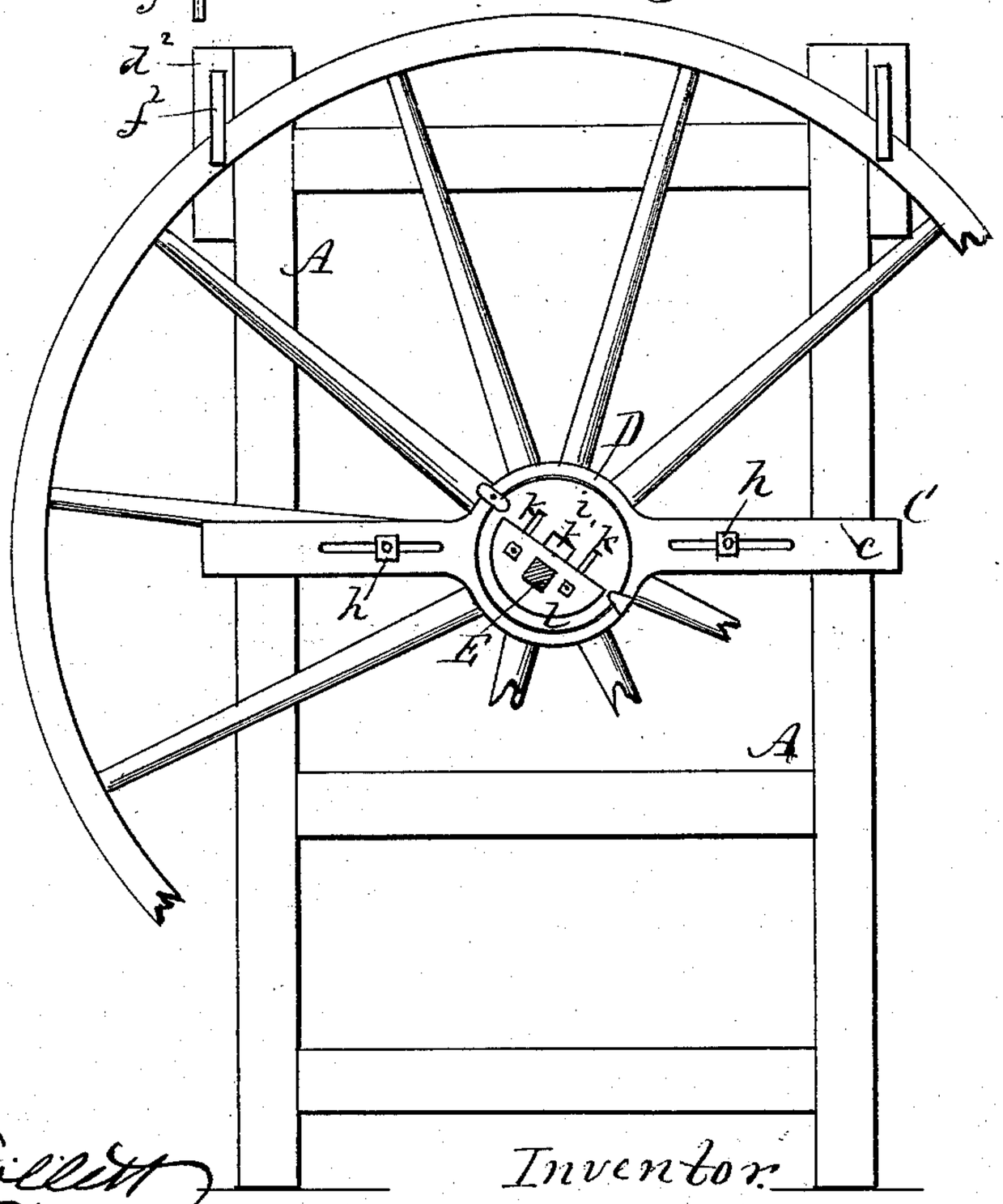


Fig. 1.

Fig. 2.



Attest.
E. P. Fillett
Chas. F. Sumner

Inventor:
Ezra Caswell.
per R. F. Osgood
atty.

(No Model.) 2 Sheets—Sheet 2.

E. CASWELL.

HUB BORING MACHINE.

No. 282,495. Patented Aug. 7, 1883.

Fig. 3.

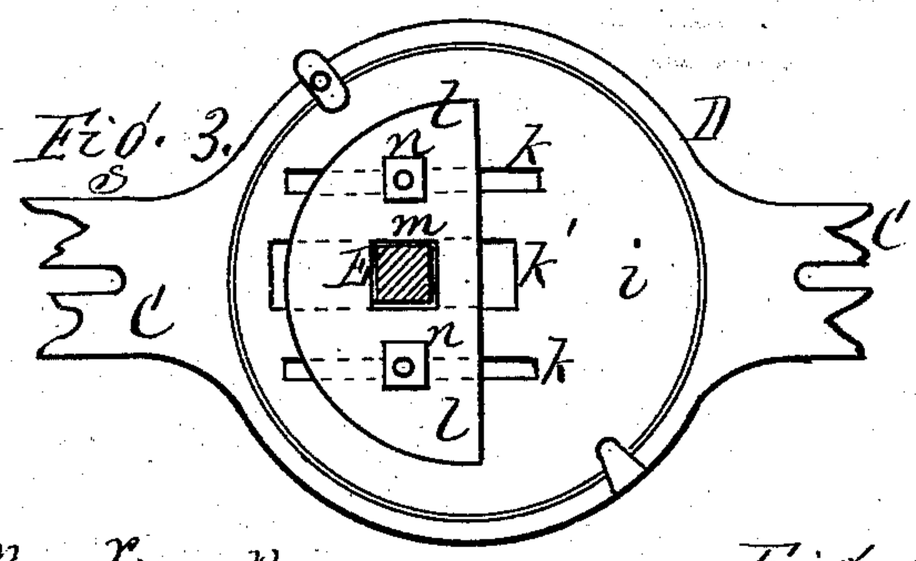


Fig. 4.

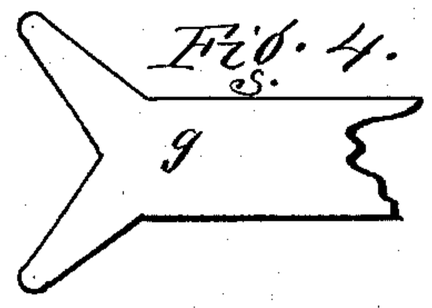


Fig. 5.

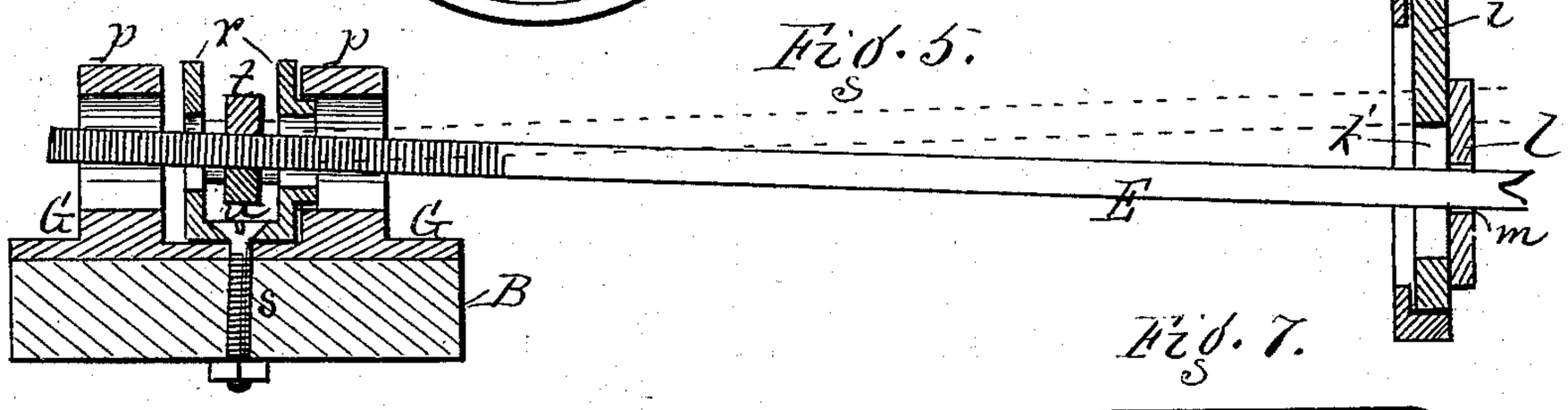


Fig. 6.

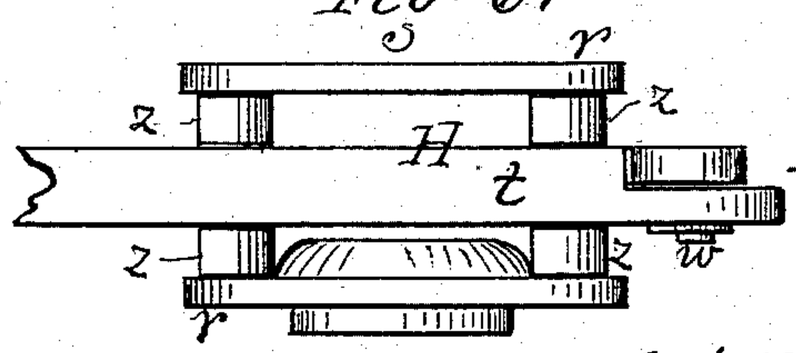


Fig. 7.

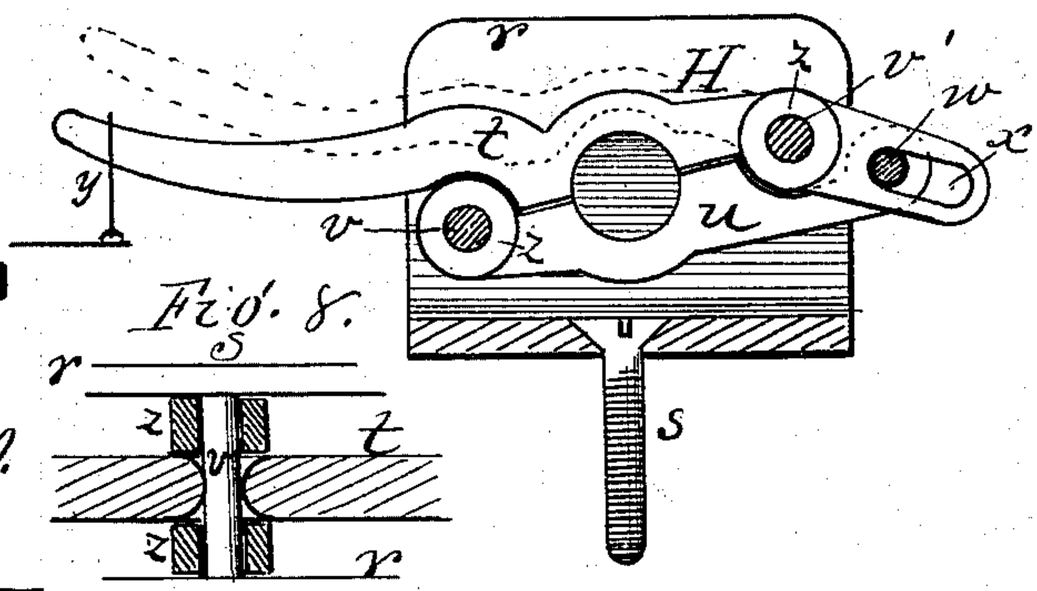


Fig. 8.

Fig. 9.

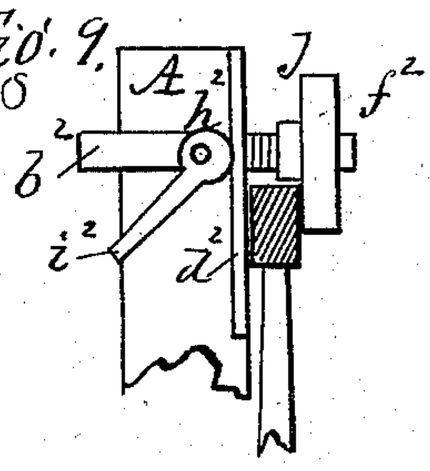


Fig. 10.

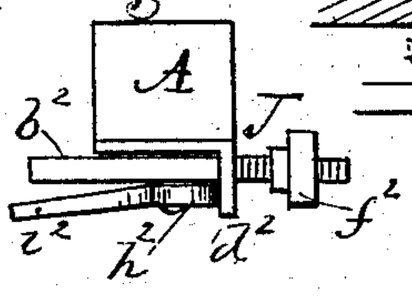


Fig. 11

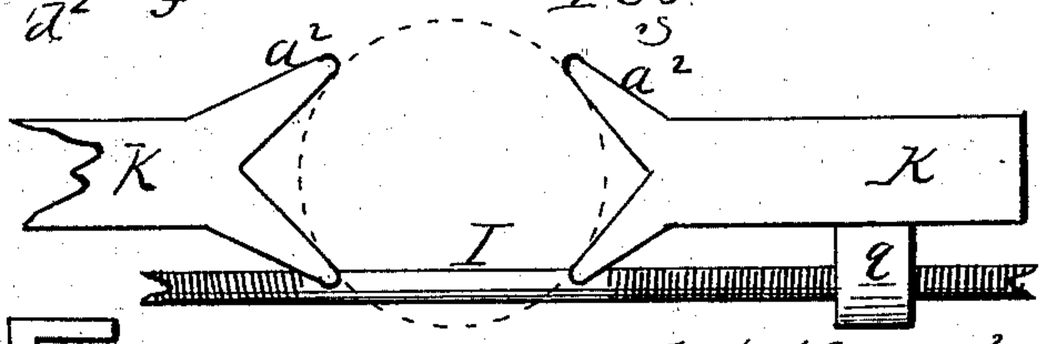


Fig. 12.

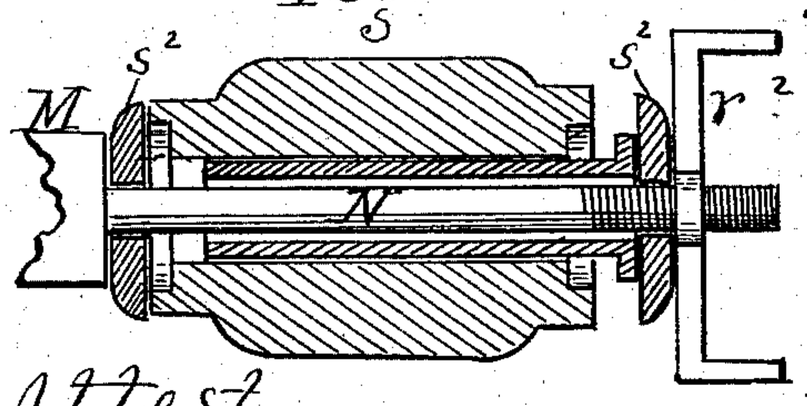


Fig. 13.

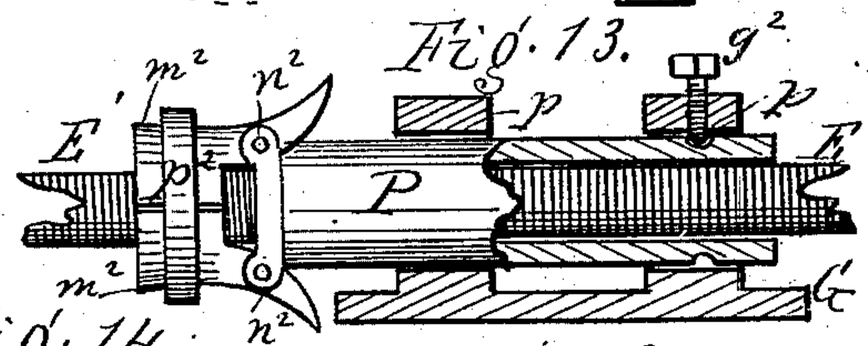
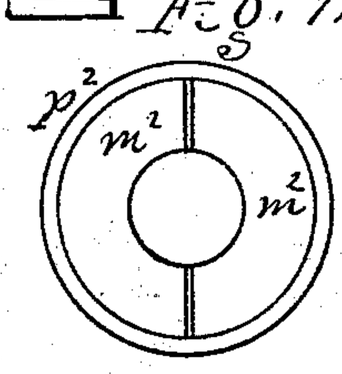


Fig. 14.



Attest.

E. P. Hollett

Chas. F. Brown

Inventor.

Ezra Caswell.

by R. F. Osgood,

atty.

UNITED STATES PATENT OFFICE.

EZRA CASWELL, OF LYONS, NEW YORK.

HUB-BORING MACHINE.

SPECIFICATION forming part of Letters Patent No. 282,495, dated August 7, 1883.

Application filed July 5, 1882. (No model.)

To all whom it may concern:

Be it known that I, EZRA CASWELL, of Lyons, Wayne county, New York, have invented a certain new and useful Improvement in Hub-Borers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a plan of the machine. Fig. 2 is an elevation. Fig. 3 is an elevation of the revolving disk and adjusting-slide enlarged. Fig. 4 is an elevation of one of the clamps. Fig. 5 is a diagram showing the boring-shaft and its connections. Figs. 6, 7, and 8 are views of the divided nut. Figs. 9, 10, 11, 12, 13, and 14 are detail views.

My improvement relates to that class of hub-boring machines in which the wheel is centered and clamped to an upright frame, and the boring-tool is attached to a shaft which is screwed inward through the hub.

The invention will be more fully defined in the following specification and claims.

In the drawings, A represents an upright frame, which presents a vertical face for the attachment of the wheel.

B is a cross-bar, which rests on longitudinal sills of the frame, and is adjustable forward and back by means of bolts *a a*, which rest in slots *b b* of the sills.

C is a frame for supporting the outer end of the boring-shaft. It consists of a head-piece, *c*, and two side pieces, *d d*, which latter slide into sockets *f f* on the sides of the frame, and are tightened at any position by set-screws *e e*. The frame C slides bodily out and in to fit hubs of different lengths. On the head-piece *c* of the frame are two clamps, *g g*, which are adjustable laterally out and in, and clamp the outer end of the hub to hold it in position. The adjustment is made by set-screws *h h*, which rest in slots of the head-piece.

D is a circular socket on the head-piece, in which rests and turns a circular disk, *i*. This disk has two parallel slots, *k k*, Fig. 3; also, a large central slot, *k'*. On the outside of the disk rests a slide, *l*, having a square opening, *m*, of just sufficient size to allow passage of the square shank of the boring-shaft E. Small bolts pass through the slots *k k* of the disk *i*, and also through the slide, and have nuts *n n* on their outer ends. By this means the slide may be moved nearer to or farther from the center of the disk, and be tightened in place at any adjustment. When the slide is moved, the boring-shaft E will be carried with it, and the shaft will slide forward and back in the central slot, *k'*. This slot is such that when the slide is moved in to the farthest extent the boring-shaft will be exactly centered in the disk *i*. The disk is fitted so loosely in its inclosing-socket that it turns easily, and the rotary movement is imparted by turning the crank *o* of the boring-shaft.

G is an iron plate bolted fast on top of the adjustable cross-bar B. This plate has two circular sockets or bearings, *p p*, located some distance apart, through which the boring-shaft passes loosely.

H is a divided nut, which is located between these bearings. The frame *r* of the nut is attached to the cross-bar by a bolt, *s*, so as to be removable from place.

The nut proper is constructed as follows: *t* and *u* are two levers, in the center of which is made the threaded female socket, one-half in each lever. The lower lever, *u*, is pivoted at its outer end at *v*. The upper lever, *t*, is pivoted at the opposite end at *v'*. The two meeting ends of the levers are pivoted together by a pivot, *w*, of the lower lever, which passes through a slot, *x*, of the upper one, as shown in Fig. 7. The opposite end of the upper lever, *t*, projects outward beyond the frame, and is held down by a spring-loop, *y*, or any other suitable holding device that allows detachment. Thus arranged, the levers open and close simultaneously and with equal movement. They are opened for the purpose of inserting the boring-shaft and closed for securing it in place. The boring-shaft is threaded on that portion which runs through the nut and smooth and square on that part which runs through the slotted disk before described. On the pivots *v v'* of the levers are rubber packings *z z*, which rest on opposite sides of the levers and between the sides of the frame *r* of the nut. In boring a straight hole the slide *l* is set up on the disk *i*, so that the boring-shaft comes in the center of the disk. To bore a tapered hole the slide is set out at any desired distance, so as to throw the boring-shaft out of center. The revolutions of the disk will also cause the outer end of the bor-

ing-shaft to describe a circle. As the cutting-tool on the shaft approaches the nut the circle lessens, and thus a true taper is produced. The packings *z z* on the pivots *v v'*, on opposite sides of the levers of the nut, allow the nut to yield with the turning of the shaft, so that no binding or strain can occur. A certain degree of play is required in the nut to compensate for the eccentricity of the shaft in turning.

I is a screw-shaft mounted on the inner edge of the cross-bar B in a direction crosswise of the machine. At opposite ends it is cut with right and left threads, and at one end it has a crank, *j*, by which it is turned.

K K are two blocks having nuts *q q* resting on the screw. As the screw-shaft is turned the blocks will be made to approach or recede from each other simultaneously. a^2 a^2 are V-clamps attached to the blocks, which embrace the inner end of the hub and center the same. The V-shaped clamps adapt themselves to the size of any hub, whether large or small. The hub is thus held at one end by the clamps a^2 a^2 and at the other end by the clamps *g g*.

J J are clamps for holding the wheel fast against the vertical face of the frame A. Each of these clamps consists of a horizontal bar, b^2, which passes through a slot of a flange, d^2, that projects from the side of the frame, as shown in Figs. 9 and 10. On the front end of the bar is a cross-head, f^2. On the bar, back of the flange d^2, is an eccentric, h^2, having a handle, i^2.

The operation is as follows: If a small wheel is attached to the frame, its rim is inserted under the lower end of the cross-head f^2. If a large wheel is attached, its rim is inserted under the upper end of cross-head f^2. The bar is then drawn back in the slot by forcing the lever of the eccentric up, which draws the wheel up to the frame.

In Fig. 12 is shown a device for driving the boxes in place in the hub. It consists of a head, M, which is fixed in the sockets *p p*, and has a fixed screw-shaft, N. Two washers, s^2 s^2, are placed upon the shaft, with the hub and box between them, and they are driven toward each other by a wrench, r^2, which turns up on the screw.

In Figs. 13 and 14 is shown an arrangement for boring straight holes in small hubs. In this case a sleeve or socket-piece, P, is secured in the sockets *p p* by means of a set-screw, g^2. The boring-shaft E' passes loosely through the sleeve, but in the opposite direction from the shaft shown in Fig. 1, and the boring is done by boring into the small end of the hub. At the outer end of the sleeve P is a divided nut, consisting of two halves, m^2 m^2, pivoted at n^2 n^2, and arranged to swing out and in. On this tapering nut slides a ring, p^2, which clamps the two halves together. To open the nut the ring is slid back. By this means, when the hub is bored through, the shaft can be at once retracted and readjusted for a new operation.

Having thus described my invention, I claim—

1. In a hub-borer having a vertical face to which the wheel is clamped, the combination of the two slides B C on opposite sides of the vertical face, capable of adjustment forward and back to fit hubs of different lengths, provided with laterally-acting clamps to clamp the opposite ends of the hub, and provided with the bearings through which the boring-shaft passes, said clamps and bearings being adjustable with the slides, as herein shown and described.

2. In a hub-borer, the combination, with the shaft E, of the frame *r*, the two levers *t u*, pivoted in the frame at opposite ends, and connected so as to open in opposite directions, forming a divided nut, and packings *z z*, applied on the pivots outside of the levers, as shown and described, and for the purpose specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

EZRA CASWELL.

Witnesses:
R. F. OSGOOD,
JACOB SPAHN.