

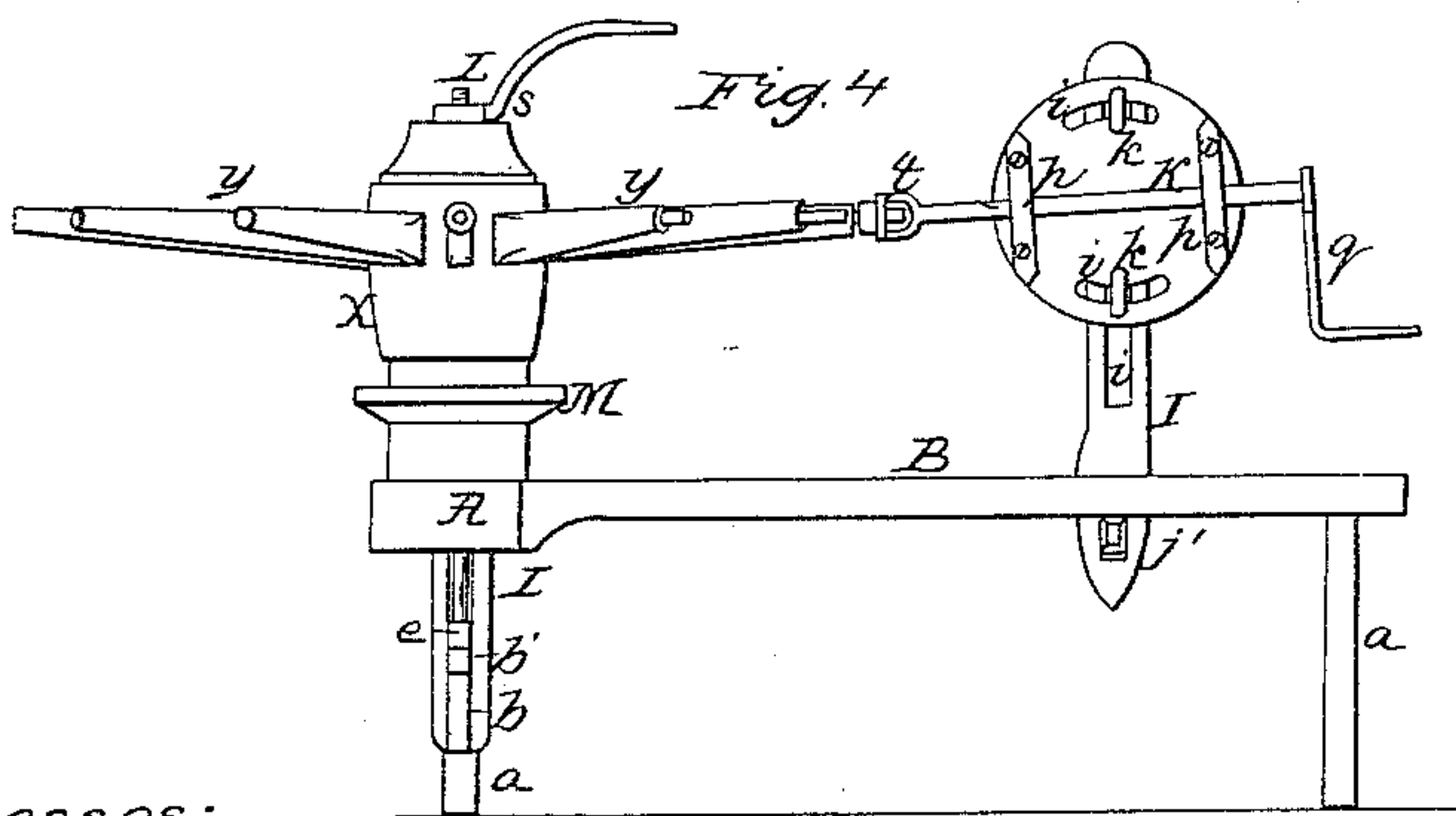
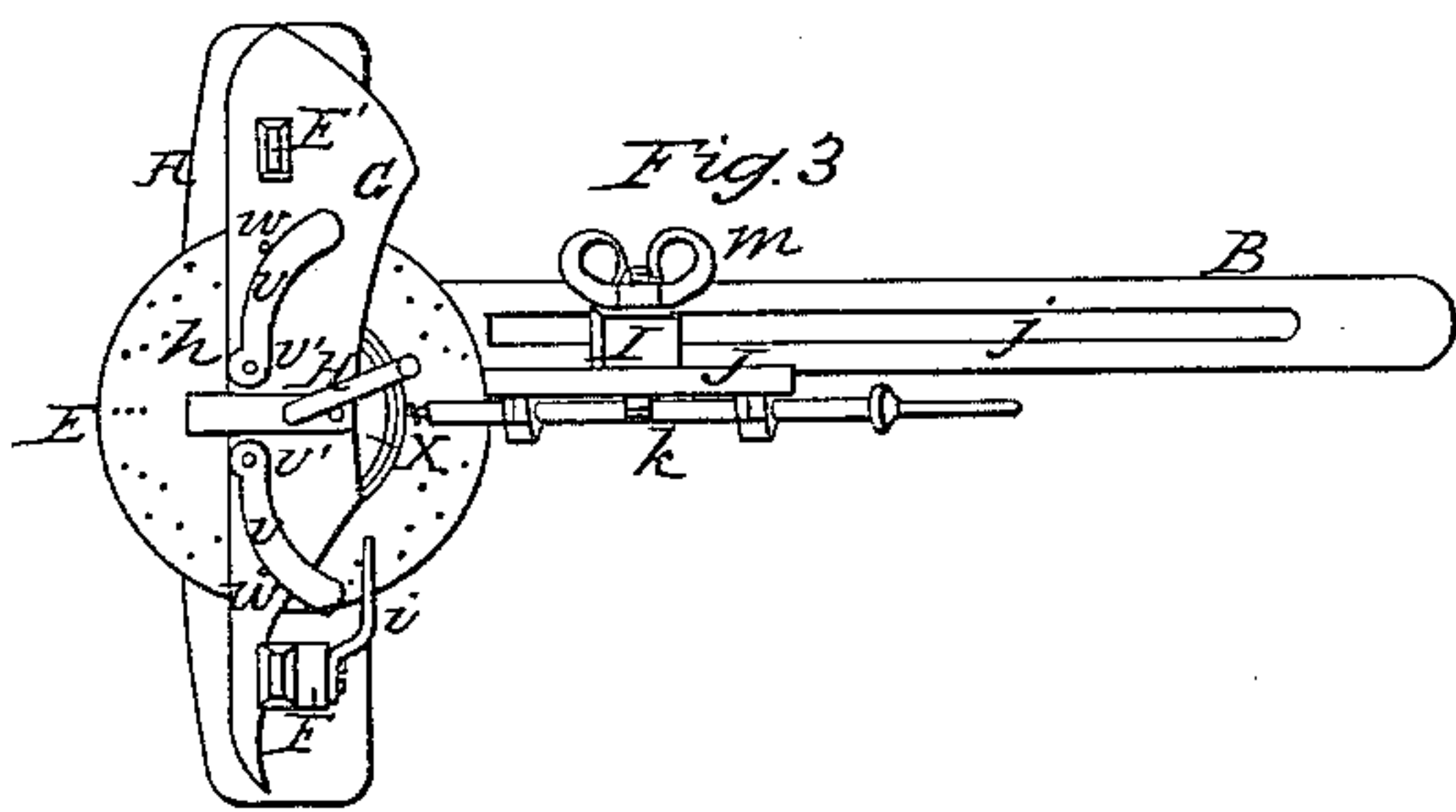
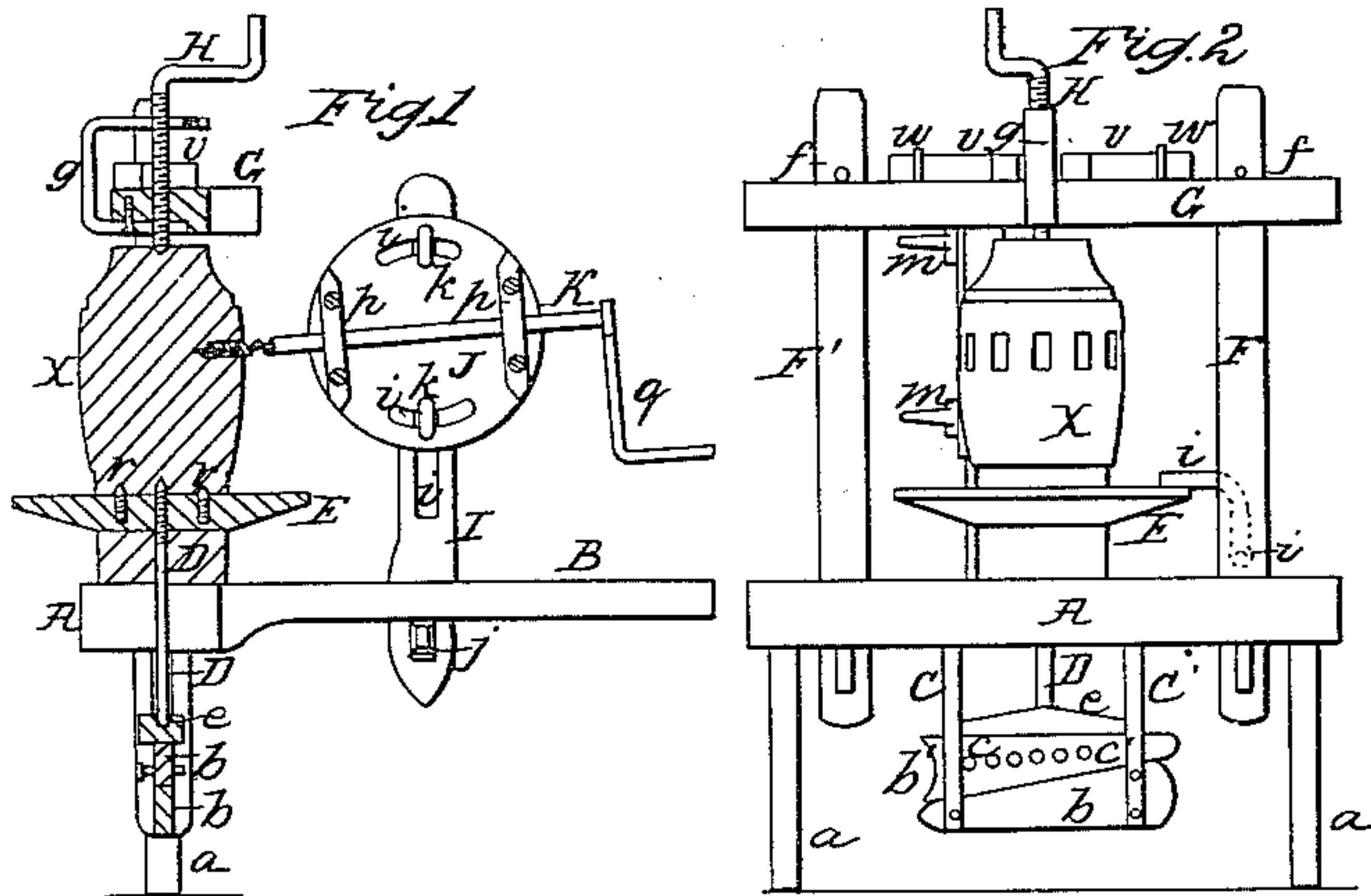
2 Sheets- Sheet 1.

H. Haag,

Boring Spokes, Fellies &c.

N<sup>o</sup> 80,726.

Patented Aug. 4, 1868.



Witnesses:

Wm. Adams  
John Parker

Inventor:

H. Haag  
By Wm. Adams  
J. Parker

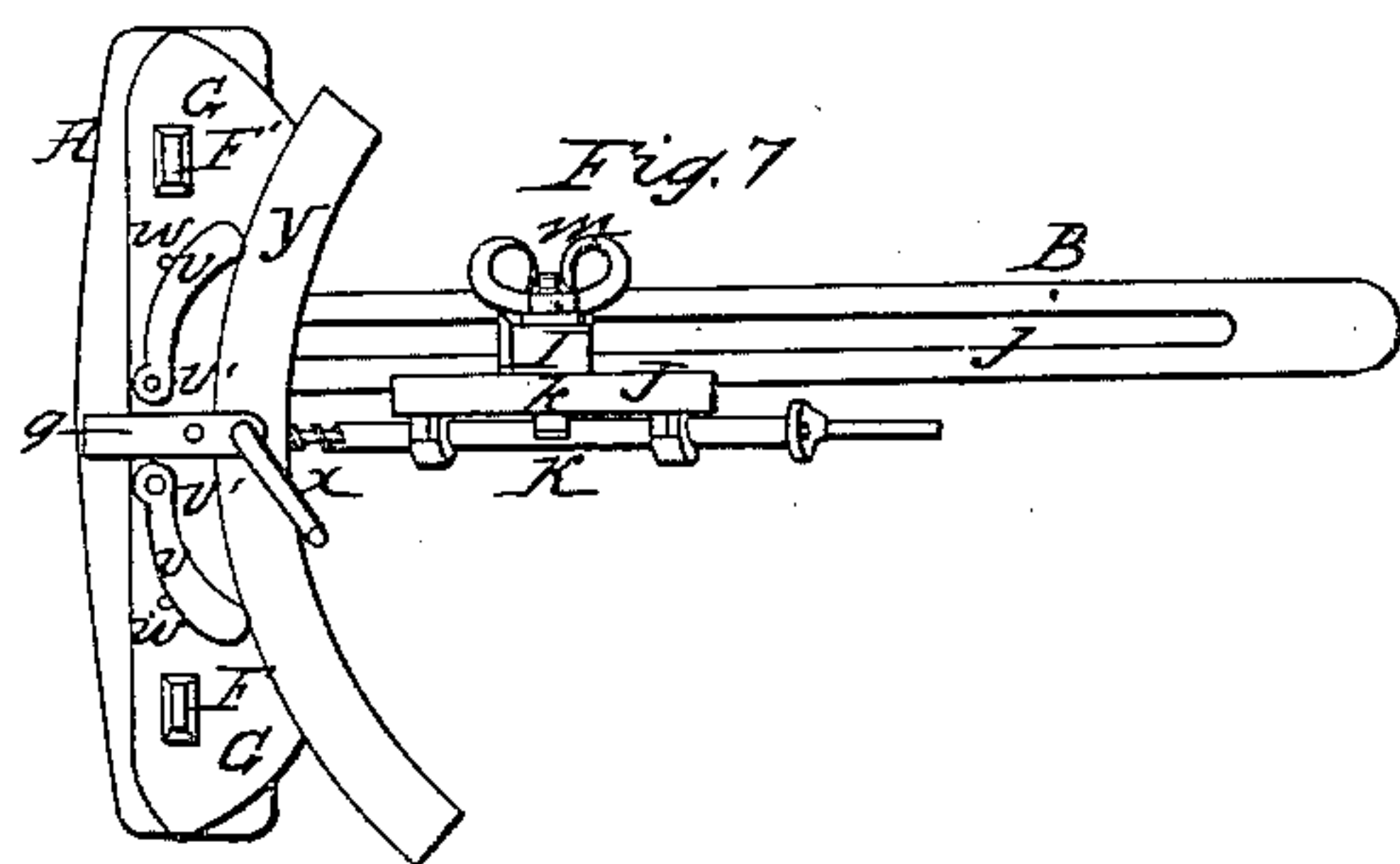
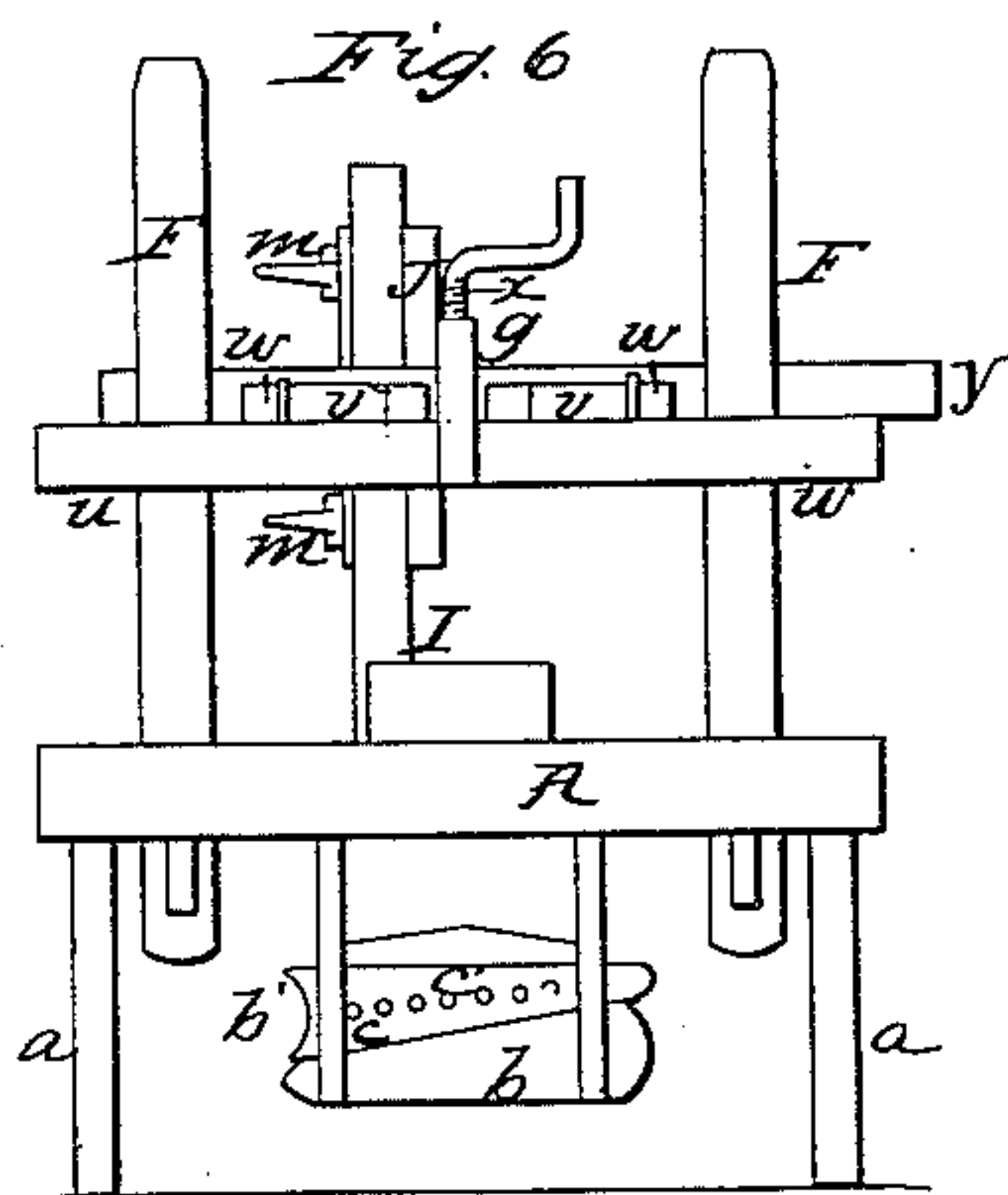
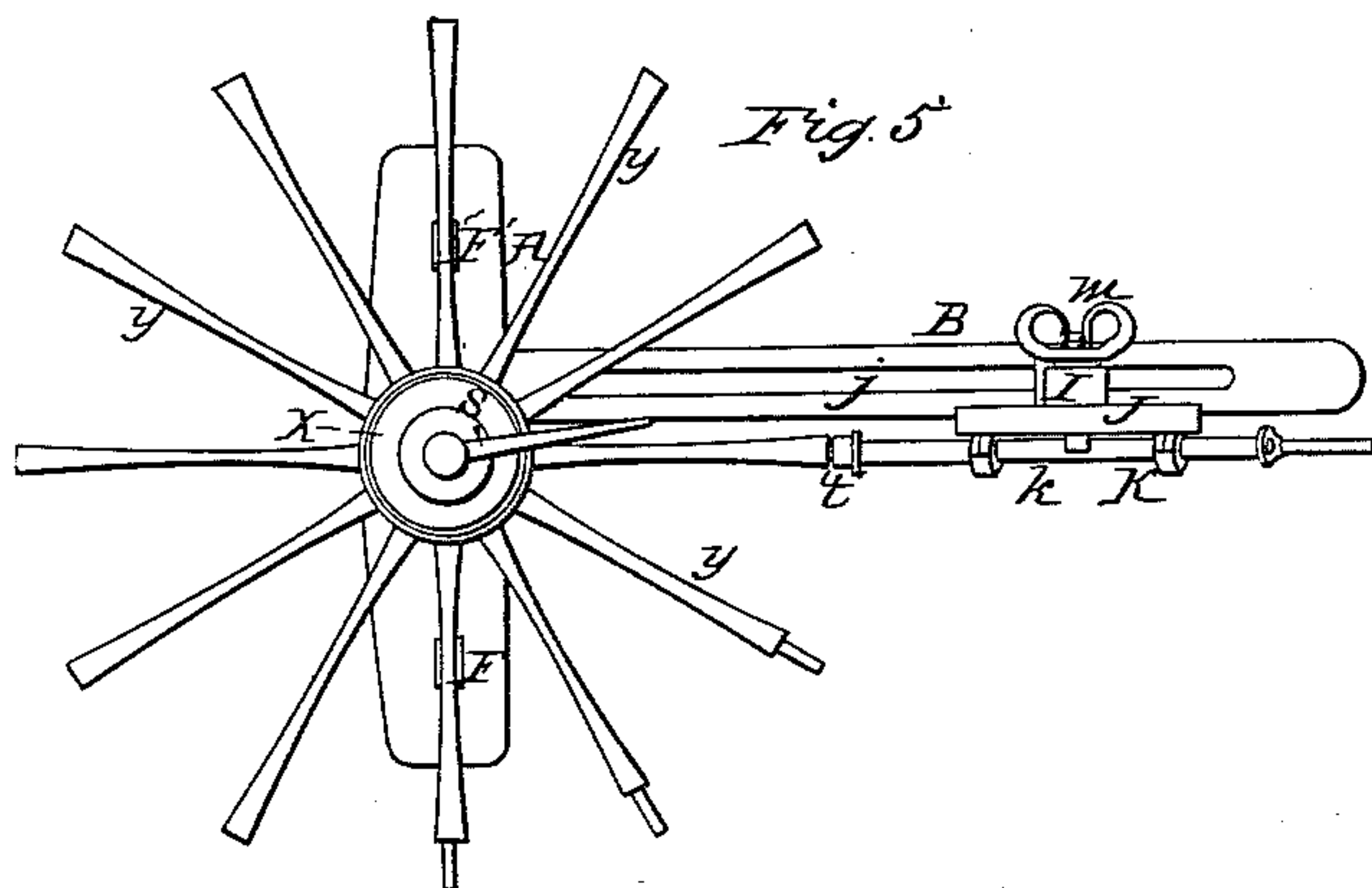
2 Sheets-Sheet 2.

H. Haag,

Boring Spokes, Fellies &c.

N<sup>o</sup> 80,726.

Patented Aug. 4, 1868.



Witnesses

Wm. Astor  
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Inventor:

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By *[Signature]*  
H. H. H. H.



# United States Patent Office.

HARRISON HAAG, OF BERNVILLE, ASSIGNOR TO HIMSELF AND GEORGE W. YAGER, OF READING, PENNSYLVANIA.

*Letters Patent No. 80,726, dated August 4, 1868.*

## IMPROVEMENT IN MACHINES FOR MAKING WHEELS.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, HARRISON HAAG, of Bernville, Berks county, Pennsylvania, have invented an Improved Hub, Spoke, and Felloe-Boring Machine; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention consists of certain adjustable mechanism, fully described hereafter, for boring the hubs, spokes, and felloes of wheels, whereby much of the tedious manipulation and measurement required for this class of work may be avoided, and the various operations rapidly and correctly performed.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation, reference being had to the accompanying drawing, which forms a part of this specification, and in which—

Figure 1, sheet 1, is a sectional elevation of my machine as it appears when in use for boring the spoke-holes in the sides of a hub.

Figure 2, sheet 1, an end view of the same, and

Figure 3, sheet 1, a plan view.

Figure 4, sheet 1, represents the machine cutting down and rounding the outer ends of the spokes of a wheel.

Figure 5, sheet 2, a plan view of the same, and

Figures 6 and 7, sheet 2, views of the machine as it appears when employed for boring the felloes of a wheel.

Similar letters refer to similar parts throughout the several views.

The frame of the machine consists of two horizontal bars, A and B, secured together at right angles to each other, and supported at their outer ends, and at a suitable height from the ground, by legs *a*.

Secured to and projecting downwards from the bar A are two slotted rods, C and C', connected together at their lower ends by a wedge-shaped block, *b*, the inclined upper edge of the latter serving as a rest for a wedge, *b'*, which passes through the slots of the rods C, and is maintained in any desired position with respect to the block *b* by a pin, *c*, which is inserted into one of a number of holes, *c*, of the wedge, (see fig. 2.)

Owing to this arrangement of wedges, a block, *e*, which rests upon the wedge *b'*, may be raised or lowered to any required extent, and upon this block is formed a step for the lower end of a vertical spindle or rod, D, which passes through the bar A, and has at its upper end a disk or circular gauge-plate, E.

Two uprights, F and F', pass through openings in the bar A, one on each side of the gauge-plate E, and are secured to the said bar by keys or otherwise, so that they may be readily detached. A cross-piece, G, connects and is arranged to slide readily upon these uprights, its upward motion being limited by pins *f*, fig. 2, and a plate, *g*, is so secured to the cross-piece that it shall project over the top of the same, as shown in fig. 1. A screw-rod, H, provided with a suitable handle, passes through a threaded opening in the plate *g* and through the cross-piece G, and is jointed at its lower end, as shown.

The centres of the screw-rod H and of the gauge-plate E are on the same vertical line, and extending around the latter, near to its circumference, are three or more rows of holes *h*, the holes of each row being at an equal distance apart, and corresponding in number with the number of holes that are to be bored in the hub of a wheel, as will be hereafter described.

A rod, *i*, is hinged to the upright, F, by a pin, *i'*, and its outer end is bent downwards, as shown in figs. 2 and 3, and arranged to enter any of the holes *h* of the gauge-plate that may be opposite to it, and thus prevent the latter from turning.

In the bar B of the frame of the machine is a longitudinal slot, *j*, through which projects the lower end of a standard, I, and the latter may be moved to any position in the said slot from or towards the bar A, and secured, after adjustment, by a key or wedge, *j'*, passing through its lower end, and bearing against the under side of the bar B.



A disk, J, is secured to the upright, I, by T-headed bolts, *k k*, which pass through curved slots, *l*, of the disk, and through a vertical slot, *l'*, of the upright, the bolts being provided at the rear of the upright with thumb-nuts, *m m*.

The tool *k*, operated by a suitable handle, *q*, passes through and is arranged to slide longitudinally in bearings, *p p*, which are secured to the face of the disk J, and whatever may be the position of the latter in respect to the upright, I, the said tool always points towards a vertical line drawn from the centre of the gauge-plate E, (see fig. 3.)

The machine, as above described, and as illustrated in the first three figures of the drawing, is arranged for boring the spoke-holes in the hub of a wheel. The latter, before being submitted to this first operation, is a mere solid block of wood, turned off on its exterior to the shape of a hub, as shown at, *x* in fig. 1.

Before securing the hub to the machine, the wedge *j'* is loosened, and the upright, I, and tool *k* are drawn back from the gauge-plate E. The hub is then placed upon the latter, resting on the pointed end of the spindle D, and upon points, *r r*, of the gauge-plate, and is pressed down upon the latter, and firmly secured by the screw-rod H, the lower pointed end of which bears upon the top of the hub, (see fig. 1.)

After thus securing the hub, the upright, I, is moved towards the same, and fastened by means of its wedge *j'*, the thumb-nuts *m m*, being then loosened, and the disk J turned until the tool *k* has been adjusted to the angle at which it is desired to secure the spokes to the hub. This having been determined, the thumb-nuts *m* are tightened and the disk again secured, after which the end of the rod *i* is inserted into one of that row of holes in the gauge-plate equal in number with the number of holes which it is desired to bore in the hub.

The tool *k* is then operated by means of its handle *q*, and, at the same time, moved forward until a hole of sufficient depth has been bored in the hub, as shown in fig. 1. It is then withdrawn, and the tool *i* is raised from the hole in the gauge-plate, after which the latter and the hub are turned until the end of the rod *i* is opposite to the next hole, into which it is inserted. The tool is then opposite another point on the hub, and a second hole is bored, from which the tool is withdrawn, as before, and the hub is turned to a third position, determined by the rod *i* and third hole in the gauge-plate, and this operation is repeated and continued until holes have been bored entirely around the hub.

By means of the above arrangement, the required number of holes may be bored in a hub at any angle previously determined, and at an equal distance apart.

After boring the hub, it may be readily withdrawn from the machine on raising the screw-rod H; and when a hub, longer or shorter than that shown, is to be bored, the gauge-plate E may be raised or lowered accordingly by means of the wedge *b'*, as before described, and the other parts of the machine adjusted to a proper position.

In preparing the machine for cutting down and rounding the ends of the spokes, after they have been attached to the hub, the standard I is moved back towards the rear end of the bar B, as shown in fig. 4, and the uprights F and F', their cross-piece G, and the gauge-plate E and its spindle, are removed from the frame of the machine.

A rod, L, fig. 4, provided with a disk, M, and having screw-threads at its upper end, to which is adapted a handled nut, *s*, is introduced into the place of the gauge-plate E and its spindle, the lower end of the rod resting upon the block *e* in the same manner as the latter.

The hub X is passed over the rod, as shown in fig. 4, and rests upon the disk M, to which it is held by the handled nut *s*, and the hub may be raised or lowered, as in the previous instance, by operating the wedge *b'*, upon which the rod L rests.

A hollow auger, *t*, (such as is generally used for work of this kind,) is attached to the face of the disk J, in place of the tool represented in fig. 1, and the disk is properly adjusted, and the upright, I, moved towards the spokes, and secured before beginning the operation.

After thus securing the hub to the machine, it is slowly turned, and its spokes *y* are brought, one at a time, to a point opposite the cutting-tool, by which, as clearly shown in figs. 4 and 5, they are successively treated, until all of them have been properly reduced and rounded at their outer ends.

The wheel may be taken from the machine after removing the nut *s*, and another secured upon the rod, the several parts of the machine being adjusted, as before, to suit any size of wheel that is to be operated upon.

In order to bore the spoke-holes in the felloes of a wheel, the parts of the machine are adjusted a third time. The standard I is moved back, the rod L and its disk are withdrawn, and the uprights F and F' and their cross-piece G, are secured to the bar A, as at first. The cross-piece G is lowered until it rests upon shoulders *u u* of the uprights, fig. 6, and a tool of the proper character is secured to the face of the disk J.

The felloes are first placed together in a circle, and marked in the usual manner at the points where they are to be bored for the spokes; they are then separated from each other, and bored in sections of one or more pieces, as I will now proceed to describe.

Two arms, *v v*, are hung to the upper side of the cross-piece G by pins, *v*, in such a manner that their outer ends can be readily adjusted towards or from each other, and the said arms, after adjustment, are held by pins, *w*, fig. 7, which enter holes in the cross-piece and bear against the rear edges of the arms.

The felloe Y, to be bored, rests upon the top of the cross-piece G, its rear convex edge bearing against the arms *v*, and it is held in this position while being bored by a handled set-screw, *x*, which passes through a threaded opening in the plate *g*.

After boring a hole in the felloe, the pressure of the set-screw *x* is released, and the felloe, still bearing against the arms *v*, is turned to a proper position for boring a second hole, which operation is repeated until all the felloes of a wheel of one diameter have been bored; and all that is necessary, in order to bore the felloes for a wheel of another diameter, is a proper adjustment of the arms *v v*.

It will be evident that the parts of the machine can be quickly and readily arranged to perform any of the above operations, and that, by its use, much tedious manipulation and measuring will be avoided, and the work rapidly and correctly performed.

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

1. A disk, J, adjustable, as described, on a standard, I, and carrying a tool, k, to which both a longitudinal and a rotary motion may be imparted for the purpose set forth.

2. The cross-head G, with its arms  $v v'$ , and screw-rods H and x, sliding on the vertical standards F F', so that when in an elevated position it will serve to retain a hub, and, when depressed, will hold a felloe, all as and for the purpose specified.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

HARRISON HAAG.

Witnesses:

JOHN WHITE,

C. B. PRICE.