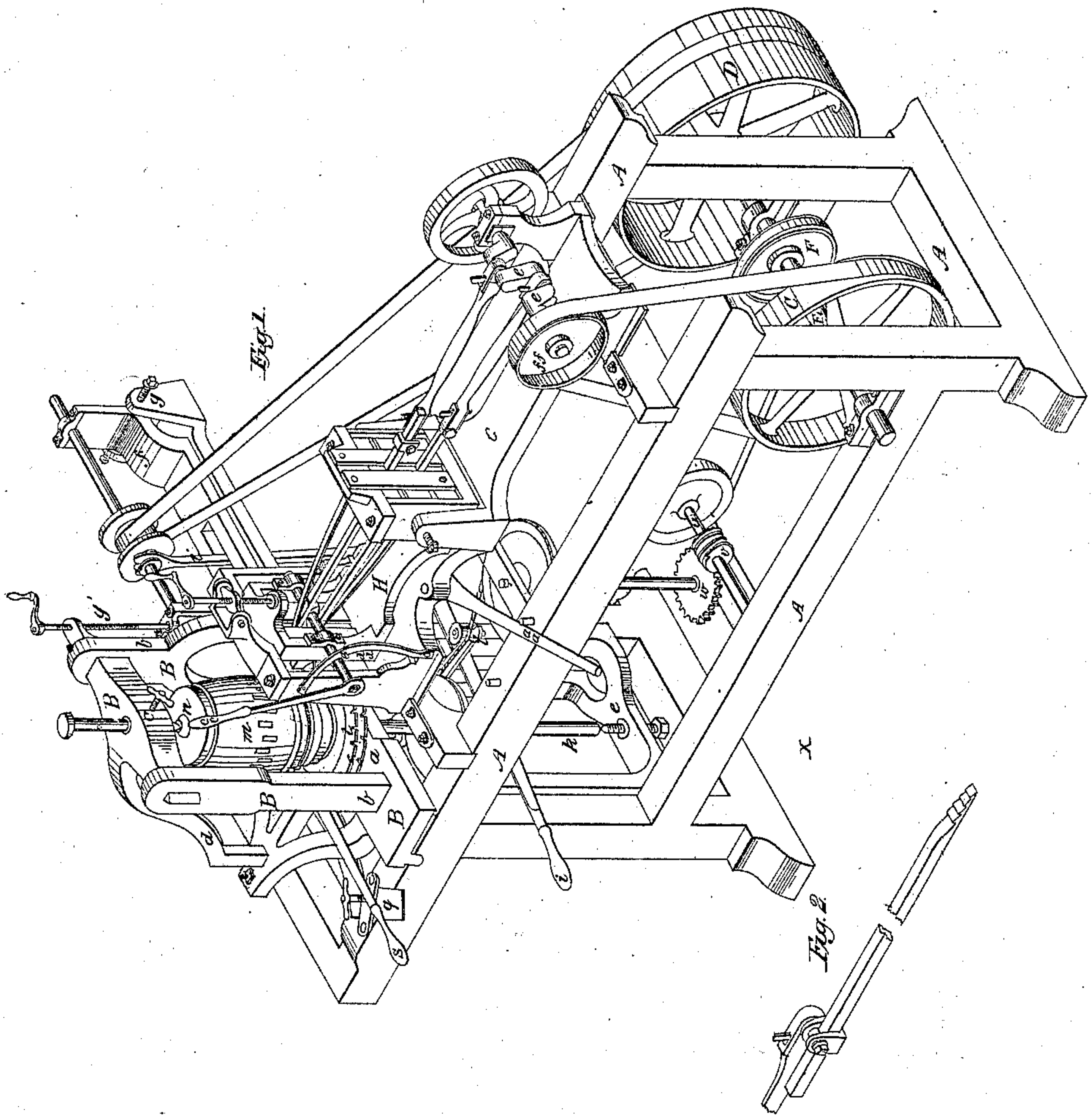


*H. Hayes,
Mortising Machine.*

N^o 15,652.

Patented Sep. 2, 1850.



Witnesses

Francis S. Low
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HENRY HAYES, OF QUINCY, ILLINOIS.

METHOD OF BORING AND MORTISING HUBS.

Specification of Letters Patent No. 15,652, dated September 2, 1856.

To all whom it may concern:

Be it known that I, HENRY HAYES, of Quincy, in the county of Adams and State of Illinois, have invented a new and Improved Machine for Boring and Mortising Wheel-Hubs; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a perspective view of the machine and Fig. 2 is a perspective view of one of the chisels detached.

A, A, A, A is the main frame, which may be made of either wood or iron.

B, B, B, B is a cast iron adjustable frame in which the hub is placed for boring and mortising. This frame is composed of, first, a bed-plate *a*; second, two jambs, *b*, *b* which pass through the bed plate and are movable therein; third, a cross bar *c* at the top, to which is connected a brace *d* which is also movable, and fourth, a bar *e* connecting the lower ends of the jambs, and also supporting the index hereafter described. The two jambs may be raised or lowered through the bed plate and adjusted to hubs of any desired length. An arm of the bed plate extends about twenty inches beyond the side of the main frame A, A, A, A and supports a second adjustable iron frame *f*, which contains the pulley and mandrel to which the auger is attached. This last frame is hung on points or pivots *g*, *g*, at its outer end, and is supported and regulated in height by the screw *g'* at its inner end. The right jamb is forked just below the cross bar *c* to give room for the auger to operate on the hub. The auger is brought into contact with the hub by bearing upon the lever *i*. This lever extends across the main frame, where it forms an elbow, and rises up through the iron frame to the auger mandrel, where it forks and embraces the mandrel between two collars or flanges. This lever works on a pin or pivot at the elbow, where a spring operates to force the lever back, which disengages the auger from the hub, and keeps it back during the process of mortising. The auger is driven by a band from the driving wheel D, on the main shaft E. A shaft or mandrel *k*, stands on a point rising through the bar *e*, and passes up through the bed plate *a*, where it receives the index *l*, and the hub *m*. The index is a metal wheel with two flanges. The lower flange may be permanent and the upper movable.

These flanges may have any desired number of notches agreeable to the number of mortises wished in a hub. The hub stands in a vertical position upon the top of the shaft *k*, and index *l*, the shaft entering the hub an inch or more. At the other or top end of the hub, a metal block *n*, having a flange to it, enters the hub about an inch, and having a center in the top, a pin or bolt *o*, is forced down on it, and by a screw *p*, confined to its place. An iron slide plate *q*, extends across the head of the main frame and is secured to any point by the screw *r*. Near the far end of this plate a small shaft passes through, extending some five inches above and eight below the plate. On the upper end of this shaft the lever *s*, is attached. On this lever a tooth projects which falls into the notches in the index. On the lower end of said shaft an arm is attached which extends along under the machine till it comes in contact with a band hereafter named. On the end of this arm is a friction roller *t*, which operates against said band, and acts as a spring to the lever *s*.

The adjustable iron frame B B B B, has two bearings, one on each side, which rest in notches on the top of the frame A A A A, and by means of a screw, having two nuts, passing through the bed plate *a*, near the brace, the frame may be so adjusted as to give any desired pitch or dish to the mortise. As the auger is connected with this frame, any inclination given to the latter does not affect the relative position of the auger to the hub.

Near the center of the main shaft E, is the main pulley F, for working the machine. Between this pulley and the driving wheel C is another pulley of a less size, connected by a band with one of like size on a small shaft *u*, extending across the frame on the left of the main shaft E. On the shaft *u*, is a spiral block or screw *v*, which works in a spur or toothed wheel *w*. This last wheel is affixed to an upright shaft on which a grooved pulley is secured, which is connected with a similar pulley on the mandrel *k*, by a round band. The friction roller *t*, rests lightly against this band when the tooth or catch of the lever *s*, rests in a notch of the index in order that the band may slip easily while the hub is stationary. By bearing the lever *s* to the left, the tooth is disengaged from the notch in the index, and the friction roller *t*, bears hard upon the band and causes the hub to revolve.

G, is a cast iron carriage resting upon

bearings on the top of the main frame, and by the lever *a a*, may be moved to and from the hub.

H, is an iron frame secured to the top of the carriage by two pins or screws at one end, and may be raised or lowered at the other by a screw *b, b*, or cam and lever. In this iron frame, which may be called a rider, are two chisels lying one above the other. At each end of the rider guides are fixed to keep the chisels in the proper position. Under the lower chisel and over the upper one are springs to force the cutting points together, and between the two a cam is worked by the lever *c, c*. By bearing down this lever the chisels are forced asunder at the points, and by a movable stop on a section of a circle *d, d*, the mortises may be made of uniform size and any desired length.

On bearings at the right end of the carriage G, is a shaft with a double crank *e e*, in the center. On one end of this shaft is a pulley *f f*, which receives the band from the driving wheel and on the other end is a small but heavy balance wheel. From the double crank two pitmen extend to the chisels and are secured or attached to them by a clamp joint hereafter described. The chisels are of a uniform size from near the cutting part to the heel, and as they become shorter by wear the clamp joint may be moved back. The clamp joint is represented in Fig. 2 and is composed of a clip or clamp closely fitted to three sides of the chisel, and closely held to its place by a bolt or pin passing through its projecting ends, the pin being slightly embedded in the heel of the chisel. The head of the pin is large and projects an inch or more from the clip, for the purpose of receiving the pitman.

The object or use of the rider is to enable the operator to dodge the mortises without loss of time, and in such a manner as to have the spokes when driven stand even or on a direct line at the outer ends.

On working this machine the operator will stand at the point X, with his right hand upon the lever *i*, and his left on the lever *s*. By bearing down the right hand lever the auger is brought in contact with the hub. When the first hole is bored, the spring throws the auger back, the left hand bears on the lever *s*, and the hub is permitted to move around. After every alternate hole is bored, the auger is raised by means of a screw or lever as described, and the intermediate holes bored. One hole only is made for each mortise. The hub being bored the operator steps before the lever *a a*, and with his right hand moves forward the carriage G, bringing the chisels in contact with the hub, when every alternate mortise is made. The points of the chisels are then raised by means of the rider as described, and the

balance of mortises made being in a zig-zag position, or dodged, as termed by wheel makers. A hub may be put in and taken out without stopping the machine, which saves much time. It is not necessary that lines or circles should be turned upon the hub to determine the length of the mortise, as the machine makes all the mortises of uniform size and distance from the outer end of the hub, till altered by set screws. The iron slide plate *g*, is not moved except in mortising a hub with fourteen or eighteen holes. As the auger stands at right angles with the chisels, the position of the hub must be changed after boring, or the chisels would not meet the holes. This is effected by moving the slider a proper distance to bring the holes immediately before the chisel, and securing it there by the screw *r*. The chisels are bearded or toothed on the inner side for the purpose of drawing the chips from the hub, which is readily effected as the hub stands on the end and the chisels work horizontally. As one chisel cuts a chip it throws it upon the beards of the returning one, which takes it clean from the hub.

I have completed a machine of the foregoing description. It is simple in construction, not liable to get out of order and will bore and mortise a hub in perfect style in one minute and a half. This it has often done.

The size of the mortise, the distance of the dodge, the distance of the mortise from the small or outer end of the hub, and the degree of dish given the wheel are all regulated by set or temper screws, and when once set, all hubs will be mortised exactly alike till the screws are moved or altered.

Any sized hub from six to fifteen inches in length may be worked in the machine.

In a machine for constant use it would be advisable to gear it in a way that the auger and chisel would not run at the same time. This may be effected by making the main shaft in two parts, each having a driving pulley. During the working of the machine, the band can be moved from one to the other as desired.

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

1. The adjustable frame B, B, B, B, with its attachments substantially as described and for the purposes set forth.

2. The application of the rider H to the carriage G substantially as described and for the purposes set forth.

3. The combination of the index *l*, the lever S and the roller *t* substantially as described and for the purposes set forth.

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Witnesses:

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