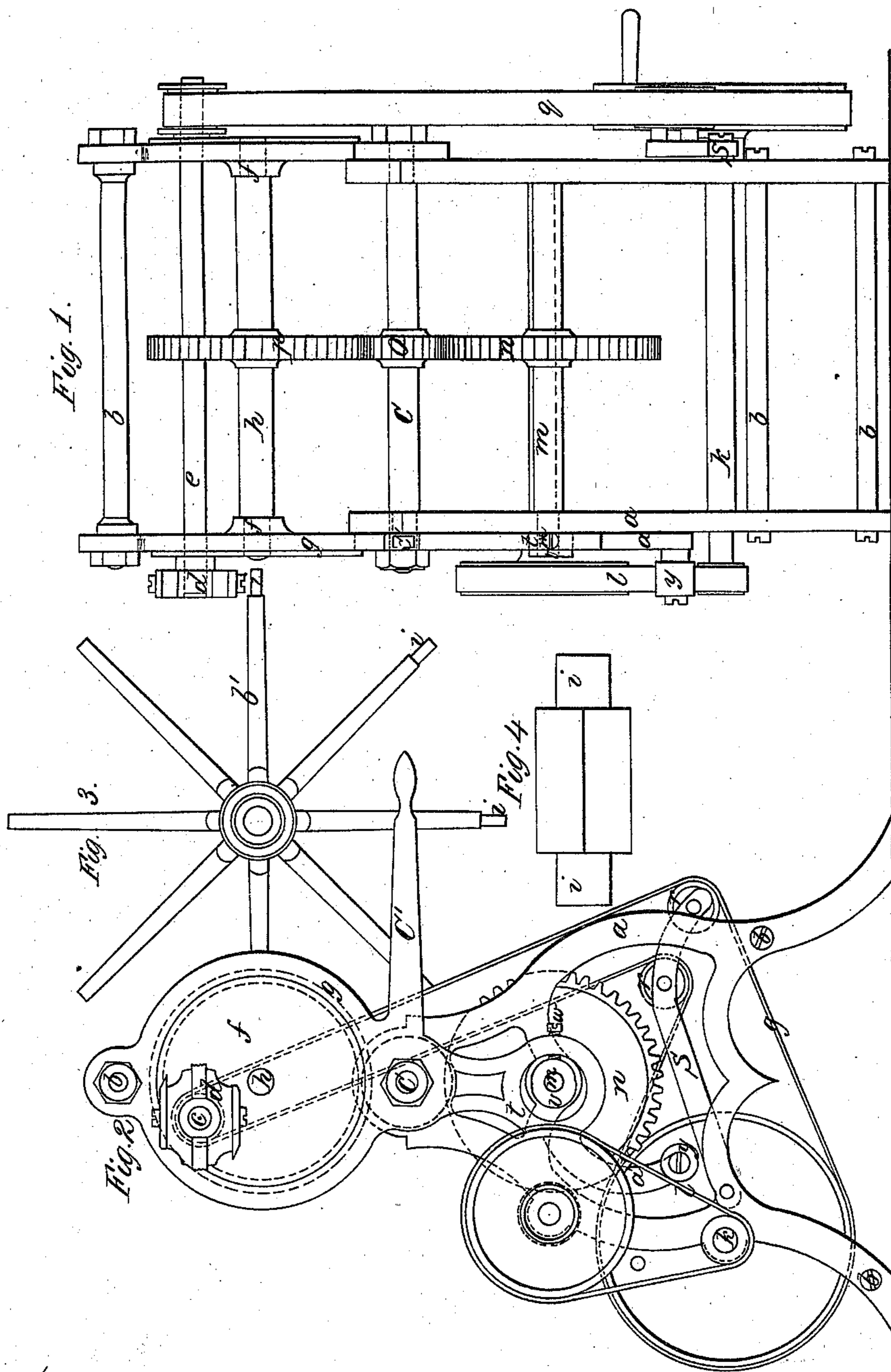


C. W. Cotton.
Tenoning Mach.

N^o 90,041.

Patented May 11, 1869.



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C. W. COTTON, OF PORTSMOUTH, OHIO.

Letters Patent No. 90,041, dated May 11, 1869.

IMPROVEMENT IN MACHINE FOR FORMING OVAL TENONS.

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

To all to whom these Letters Patent may come:

Be it known that I, C. W. COTTON, of Portsmouth, in the county of Scioto, and State of Ohio, have invented a new and useful Machine for Forming Round or Oval Tenons in Wood-Work; and I do hereby declare the following to be a full and exact description of the same, reference being had to the drawings accompanying and forming part of this specification, in which—

Figure 1 represents a side elevation of my machine, and

Figure 2, an end view of the same.

Figure 3 shows a spoke-wheel, and the manner of applying my machine for forming tenons thereon; and

Figure 4, a piece of framing, with cylindrical tenons, as formed by my machine.

Similar letters of reference on the different figures indicate corresponding parts.

The nature of this invention consists in the arrangement of devices for forming oval tenons, for purposes that will hereinafter be explained.

In cutting round tenons on spokes, chair-stretchers, and wood framing of all kinds, when round tenons are employed, the pieces have hitherto been forced into chucks, the wood being removed by cutters, until the shank or tenon was reduced to fit the bore of the chuck, and thus form a rest for the wood. By this means cylindrical tenons could only be made, while their diameter had to correspond to the bore of the head or chuck, different heads or chucks being required for the different sizes. The cutters being internal, that is, the body of the cutter, with its fastenings, moving in a much larger circle than the cutting-edges, prevented the cutters from being driven at a speed that is necessary for rapid and perfect work.

Tenons for general wood-work, and more particularly those of the spokes of carriage and wagon-wheels, can be fitted much closer, and driven more firmly, if formed slightly oval, their shortest diameter being set transverse to the fibre of the wood, by which means the danger of splitting is avoided.

To enable others skilled in the art to make and use my invention, I will proceed to describe the mode of constructing and manner of operating the same, with the aid of the drawings.

a is a frame, or main support for the machine, arranged in the usual manner, with bearings for the several shafts and parts, having cross-supports *b b b* and rod *c*.

d is the cutter-head, and *e* the spindle on which it is fastened.

f f are disks, arranged to rotate in the frame *g*, connected by the rod *h*, to which they are firmly keyed.

The bearings for the spindle *e* are formed in or attached to the disks *f f*, and can be made to adjust to or from the centre *h*, fig. 2, to regulate the size of the tenon *i*, or the heads *d* can be made of varying sizes,

to effect the same purpose, when such changes are few.

The disks *f f*, being loosely fitted in the ring-frame *g*, are rotated by means of the shaft *k*, belt *l*, shaft *m*, and gears *n o p*, as will be understood from the drawings, the gears being so proportioned and arranged that the revolutions of the disks *f f* correspond to those of the shaft *m*, for reasons that will be hereinafter explained.

The gear *o* runs loose on shaft *c*, and is merely an intermediate.

The cutter-head *d* is driven by the belt *q*, the idle-pulleys *r r* keeping the tension constant, by means of the private arm *s*, as will be readily understood.

The frame *g* is pivoted on centre at *c*, fig. 2, and has an extension, *t*, passing down and surrounding the cam *v*.

This cam is fastened to the shaft *m*, and rotates in concert with the disks *f f*, and the motion of the cutter-head *d* around the tenon *i*.

This cam *v* is made slightly elliptic, when the machine is made to form oval tenons, and the screw *w* pressing against it, gives the frame *g* a vibrating motion, to correspond with the rotation of the disks *f f*, and communicates the same shape to the tenon *i*; that is, if the cam *v* has a difference of one-eighth inch between its long and short diameters, the tenons formed by the cutter-head *d* will have relatively the same diameters as the cam *v*.

Cams of varying diameters, and more or less elliptic, can be used, to suit the different forms of tenons, or a single one may be employed, if arranged to adjust for the purpose of making the tenon more or less oval. The one here represented is fixed. For cylindrical tenons, the eccentric cam is removed, and a true cylindrical ring put on, or other means of regulating the movement of the frame *g* employed, and this feature of the machine dispensed with.

y is a small pulley, to tighten the belt *l*, and is supported on a bracket, *a'*, connected with frame *g* and *t*, and serves to start and stop the gearing *n o p*, as will be hereinafter explained.

Fig. 3 shows a wagon-wheel in position to have tenons formed on the spokes.

The manner of operating is as follows:

The piece to be tenoned is brought into the position of the spoke *b'*, fig. 3, and held there by suitable devices, unnecessary to be shown here, and forming no part of the machine proper.

The frame *g* is thrown back until the side of the ring *t*, opposite screw *w*, comes against the cam *v*. This swings the head *d* out of the way, and allows the stuff to be brought into position.

The operator then presses down the lever *o'*, which draws the head *d* into contact with the tenon, and brings the screw *w* against the cam *v*, and at the same time tightens the belt *l*, by means of pulley *y*. This causes the head *d* to travel around the tenon *i*

in a true circle, or in an elliptic form, as the cam *v* may guide.

When the head *d* has made one or more revolutions, as may be needed, the operator releases the lever *c'*, the frame *g* swings back, the belt *l* stops, and another piece is applied.

I am aware that machines having a revolving cutter-head, revolving on its own axis, and that axis revolving around a centre, for the purpose of making round tenons, has been in use for many years; and I disclaim the use of the arrangement of devices for such purpose, and confine my invention to the combination of devices for making oval or elliptical tenons.

Having thus described the nature of my invention,

the mode of constructing, and manner of operating my machine,

What I claim as new, and desire to secure by Letters Patent, is—

The combination of the elliptic cam *v*, on shaft *m*, screw *w* in arm *t*, and vibrating frame *g*, with the cutter-head *d*, cutter-head disks *f*, and the mechanism for giving motion to the cutter-head, cutter-head disks, and shaft *m*, substantially in the manner and for the purpose described.

C. W. COTTON.

Witnesses:

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