H. T. Clay,

Gage Lathe.

No. 69,543. Patented Oct. 8, 1867.

Fig. 1.

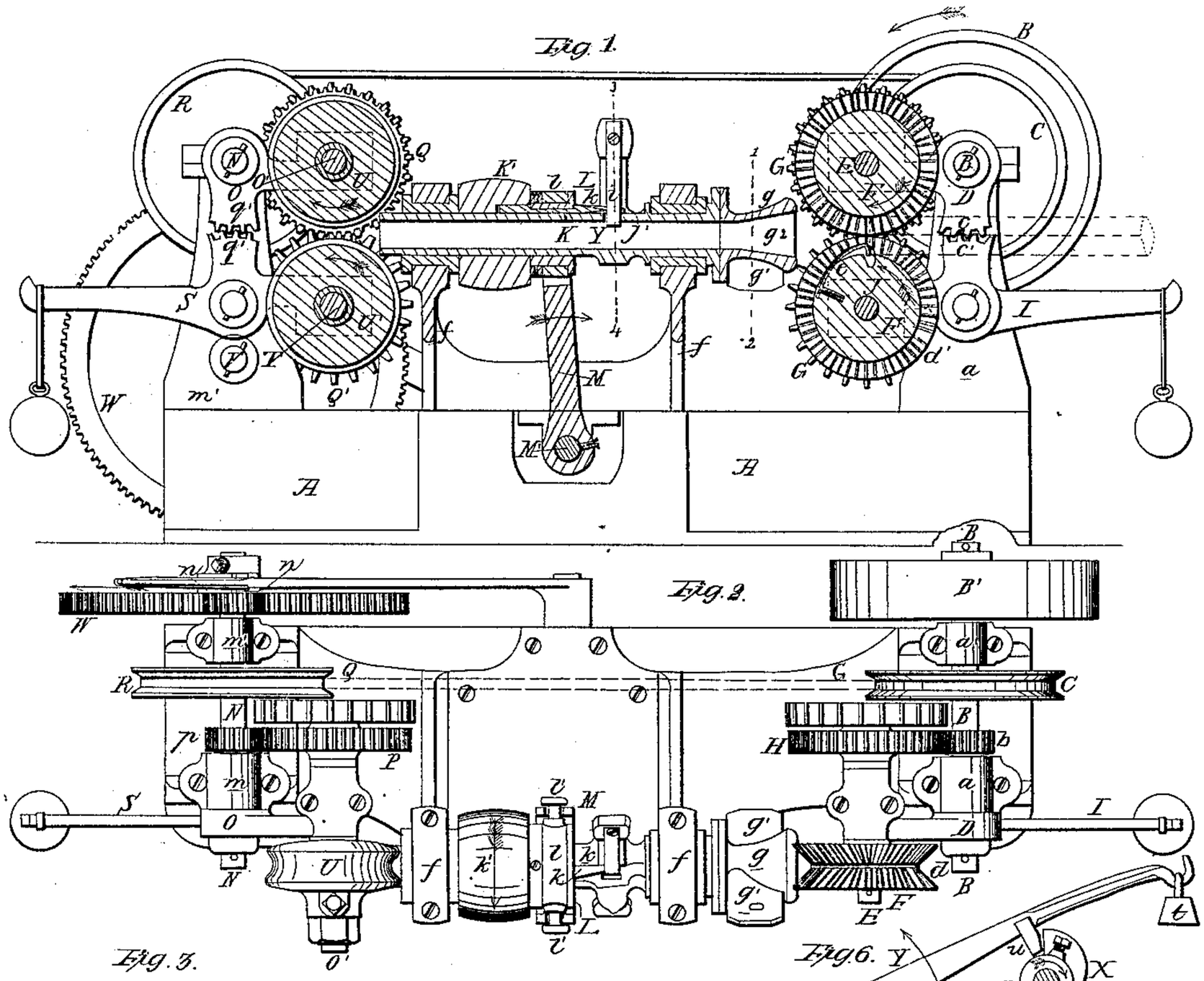

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

Witnesses:

Wm. Albert Stiel.
John Parker

Inventor:

H. T. Clay
By his Attys
H. Howson

United States Patent Office.

HENRY T. CLAY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND G. R. BLAKISTON, OF SAME PLACE.

Letters Patent No. 69,543, *dated October* 8, 1867; *antedated October* 2, 1867.

IMPROVEMENT IN WOOD-LATHES.

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, HENRY T. CLAY, of Philadelphia, Pennsylvania, have invented a Lathe for Turning Broom-Handles and other objects; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

My invention consists of certain mechanism fully described hereafter for turning straight, or tapering, or other shaped handles for brooms and other objects.

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. On reference to the accompanying drawing, which forms a part of this specification—

Figure 1 is a longitudinal sectional view of my improved machinery for turning handles, &c.

Figure 2, a plan view of the same.

Figure 3, a sectional view on the line 1–2, fig. 1.

Figure 4, a section on the line 3–4, fig. 1.

Figure 5, an exterior view of fig. 4; and

Figures 6, 7, and 8, detached views of parts of the machine.

Similar letters refer to similar parts throughout the several views.

A is the base of the machine, on which are two standards, *a* and *a'*, and in the latter turns a shaft, B, provided with a driving-pulley, B', and on the same shaft, between the standards, is a pinion, *b*, and a pulley, C. On the end of the shaft B is hung loosely a bell-crank lever, D, one arm of which terminates in a toothed segment, *c*, and in bearings on the end of the other arm turns a spindle, E, on which is a wheel, F, having a serrated or roughened groove, *d*, the sides of which are at right angles to each other. On the other end of the spindle E is a cog-wheel, G, and motion is imparted to the said spindle by a cog-wheel, H, which gears into the pinion *b* upon the driving-shaft B. A weighted lever, I, is hung to the standard *a*, and this lever has a toothed segment, *c'*, which gears into the segment *c*. In bearings on another arm of this lever, shown in dotted lines, fig. 1, turns a spindle, J. On one end of this spindle is a cog-wheel, G', which is of the same diameter as and gears into the cog-wheel G above, and on the other end of the spindle J is a grooved wheel, F', directly beneath and similar to the grooved wheel F upon the spindle E. In the groove *d'* of the wheel F' is a spring-guide or stop,

A hollow spindle, K, having a driving-pulley, K', turns in suitable bearings in uprights *f f*, secured to the base A, and to the end of this spindle is bolted or otherwise secured a conical tube, *g*, figs. 1 and 2, having on each side a lug, g^1. To one of these lugs is secured a chisel, *h*, which projects through the side of the tube, and into the conical opening g^2 of the same. Upon opposite sides of the spindle K are two projecting lugs, *i*, fig. 4, and near to the outer end of one of these lugs is secured an elastic cutting tool, *i'*, which projects through a hole, *j*, into the opening *j'* of the spindle, the said cutter being sufficiently elastic to admit of a slight movement from and towards the centre of the spindle K. Upon this spindle K is a sleeve, L, having a wedge, *k*, which projects from the sleeve into the space between the tool *i'* and the lug *i*, and encircling the sleeve L is a collar, *l*, provided on opposite sides with headed pins *l'*, which fit freely in the forked ends of an arm, M, projecting from a rock-spindle, M', which turns in bearings in the base A, motion being imparted to this spindle in a manner hereafter described. Two standards, *m* and *m'*, similar to the standards *a a'* at the opposite end of the machine, are secured to the base A, and in these standards turns a spindle, N, on which is a pinion, *n*. To the spindle N is hung loosely a lever, O, precisely similar to the lever D of the shaft B, and this lever is provided with a spindle, O', having two cog-wheels, P and Q, the former gearing into a pinion, *p*, on the spindle N, and motion being given to the spindle by a chain, which connects its pulley R with the pulley C upon the driving-shaft B. A weighted lever, S, is hung to the standard *m*, and like the lever I has a toothed segment, *q'*, gearing into the segment *q* of the lever O. The lever S is also provided with a spindle, T, turned by means of a wheel, Q', gearing into the wheel Q of the spindle O'. Upon the ends of each of the spindles O' and T, and directly opposite to the end of the hollow spindle K, is a wheel, U. Each of the wheels U and U', as seen in fig. 8, is formed by two disks, *r* and *r'*, between which is secured a ring, *s*, of gum-elastic having upon its edge a semicircular groove, *s'*. Turning in the lower part of the standards *m m'* is a spindle,

V, upon which is a large cog-wheel, W, gearing into the pinion *n* of the spindle N, and in the same spindle V, and against the face of the wheel W, is a cam, X, shown in fig. 6. An arm, Y, projects from the rock-shaft M′, close to the face of the wheel W, and over the cam X, and by means of its weight, *t*, a projection, *u*, of the arm bears continually upon the said cam.

Operation.

Power is applied to the driving-pulley B′, and is transmitted through the wheels *b* and H, G, and G′, to the grooved wheels F and F′, which revolve in the direction of their arrows, fig. 1. At the same time, by means of the chain connecting the pulleys C and R, and the gearing before described, the elastic grooved wheels U and U′ are caused to turn simultaneously with and at the same speed as the wheels F and F′. As the pinion *n* gears into the large cog-wheel W, the latter and the cam X will revolve slowly. The hollow spindle K is also caused to revolve rapidly in the direction of its arrow, fig. 2. When the cam X upon the rock-spindle V is in the position shown in fig. 6, the arm Y is depressed, and the other arm, M, of the same spindle M′ has moved back the sleeve L and its wedge *k* from beneath the cutter *i′*, when the latter will be in the position shown in fig. 4, which is its proper one, when the operation begins. The square strips to be turned are inserted between the grooved wheels F and F′, the proper time for insertion being indicated by the arrival of the spring-plate *e* to the position shown in fig. 1, the end of the spring forming a stop for the strip. The wood is carried towards the hollow spindle K by the wheels F and F′, which wheels, by the action of the weight upon the lever I, retain a firm hold upon the wood and prevent it from turning round. The strip enters the conical end g^2 of the spindle K, and is roughly rounded by the cutter *h* in the tube *g*. It is gradually forced through the spindle K until it reaches the cutter *i″*, by which the wood is turned first to the smallest diameter required. In the meanwhile the cam-wheel X revolves with the wheel W in the direction of its arrow, and the arm Y is raised, partially turning the rock-spindle M′ and causing the arm M to move the sleeve L along the spindle K, and the wedge *k* between the cutter *i″* and its lug *i*, consequently the cutter *i′* is gradually forced from the centre of the spindle, and the diameter of the wood increases as it is pushed through the spindle. The wood, as it is turned, passes on through the spindle K, and between the elastic wheels U and U′, by which it is drawn from the machine, as they adapt themselves to the diameter of the shape of the strip or handle. When the cam X has made a complete revolution, the arm Y, by the action of its weight *t*, falls until its projection *u* rests upon the portion of the cam X having the smallest radius. The arm Y in falling draws the wedge *k* from between the tool *i′* and its lug *i*, and the tool springs from its proper position, ready to commence its operations on a second strip of wood. The position of the tool in the spindle K is determined by that of the wedge *k*, and as the latter is operated by the cam-wheel X, it is evident that the shape imparted to the strip depends upon the form of the cam-wheel employed. The cam-wheel shown in the drawing is intended for use in turning broom-handles and other objects of a tapering form, but all that is necessary in order to produce a variety of shapes is to vary the form of the cam-wheel.

On reference to fig. 8 it will be seen that each of the wheels U and U′ consists of two disks, *r* and *r′*, the former having a tubular stem, *t*, projecting through the latter, and the stem having a nut, *w*, by turning which the disk *r′* may be moved nearer to the disk *r*, thereby compressing and increasing the diameter of the India-rubber ring *s*, after the latter has been worn. As the spindle K with its cutters revolves very rapidly, it is important that it should be balanced; hence I secure to a lug on the arm *i*, opposite to that which carries the cutter, a weight, 3, by adjusting which from or towards the centre of the spindle K the opposite arm may be perfectly balanced.

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

1. The spring *e*, or its equivalent, arranged on the grooved wheel F′, as and for the purpose described.

2. The construction of the wheels U U′, each consisting of two disks, *r* and *r′*, with an intervening ring of gum-elastic, when the said disks can be adjusted towards each other for the compression of the ring, as set forth.

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

HENRY T. CLAY.

Witnesses.

CHARLES E. FOSTER.

W. J. R. DELANY.