# G. N. WESTCOTT.

## LATHES FOR TURNING IRREGULAR FORMS.

No. 171,201. Patented Dec. 14, 1875

Fig-1

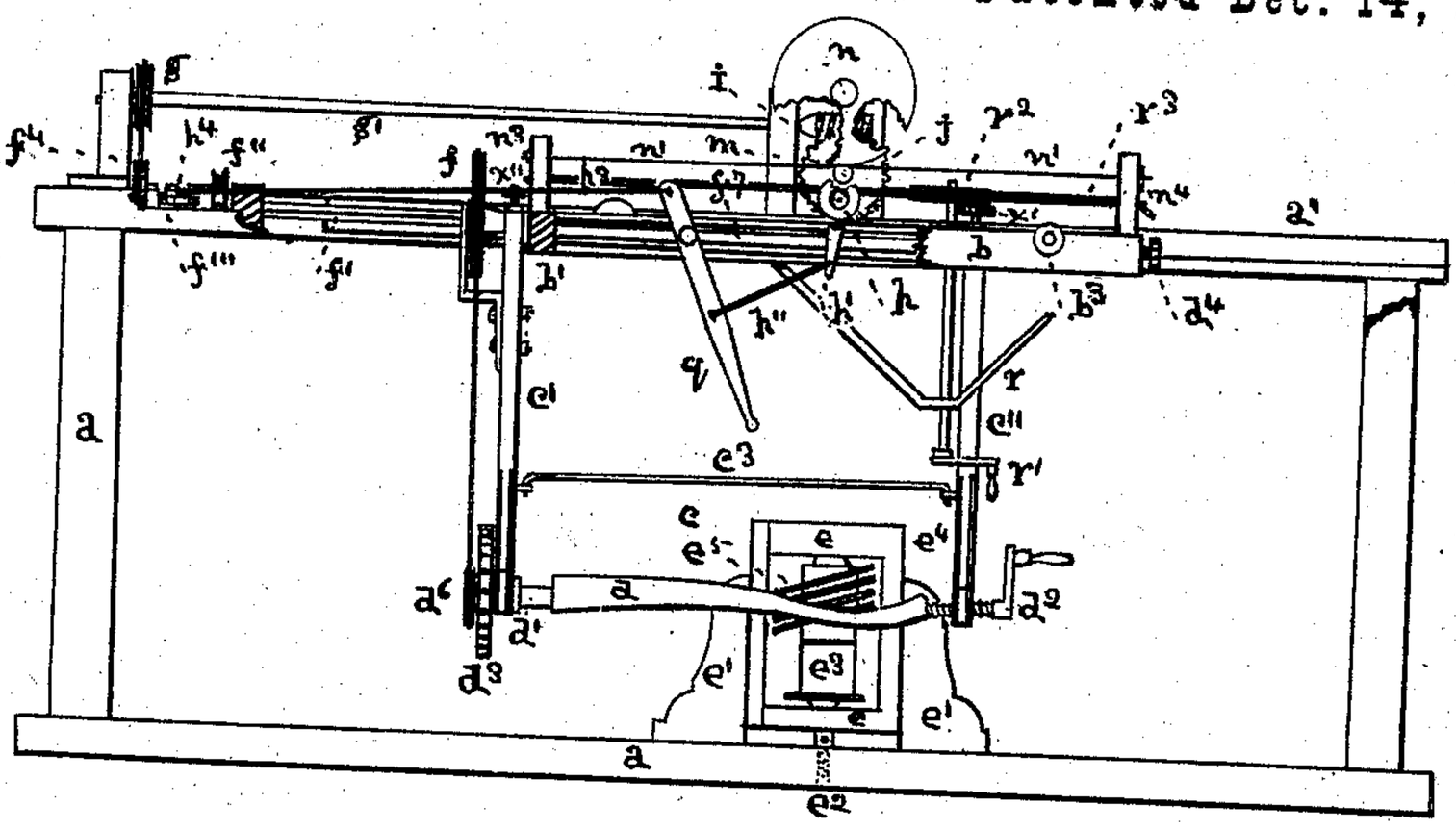


Fig-2

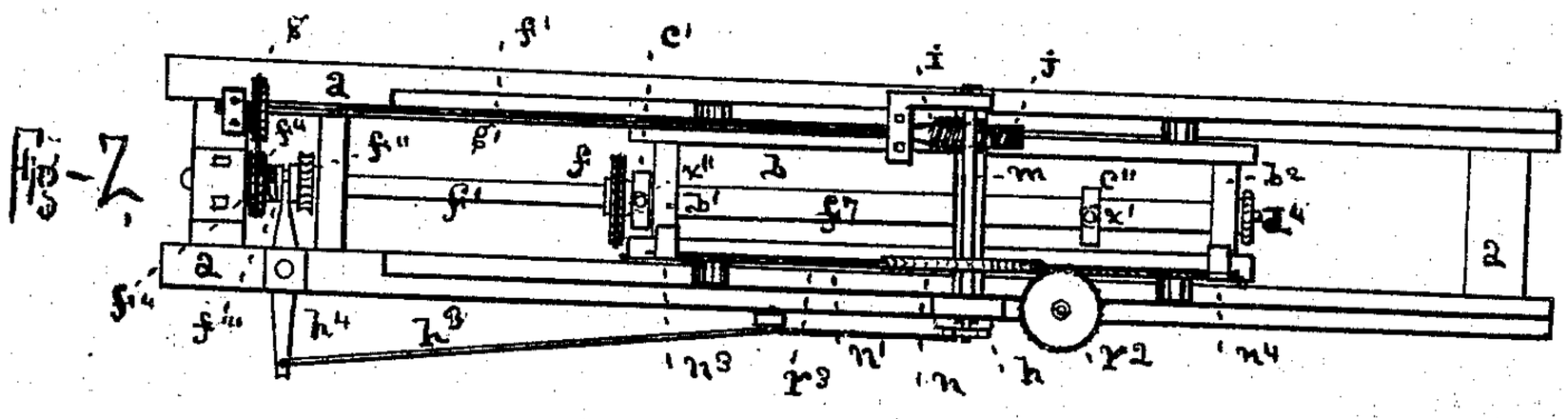


Fig-6.

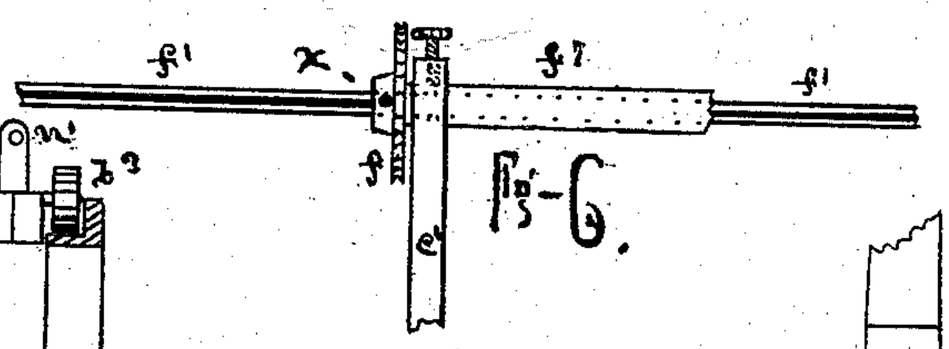


Fig-3

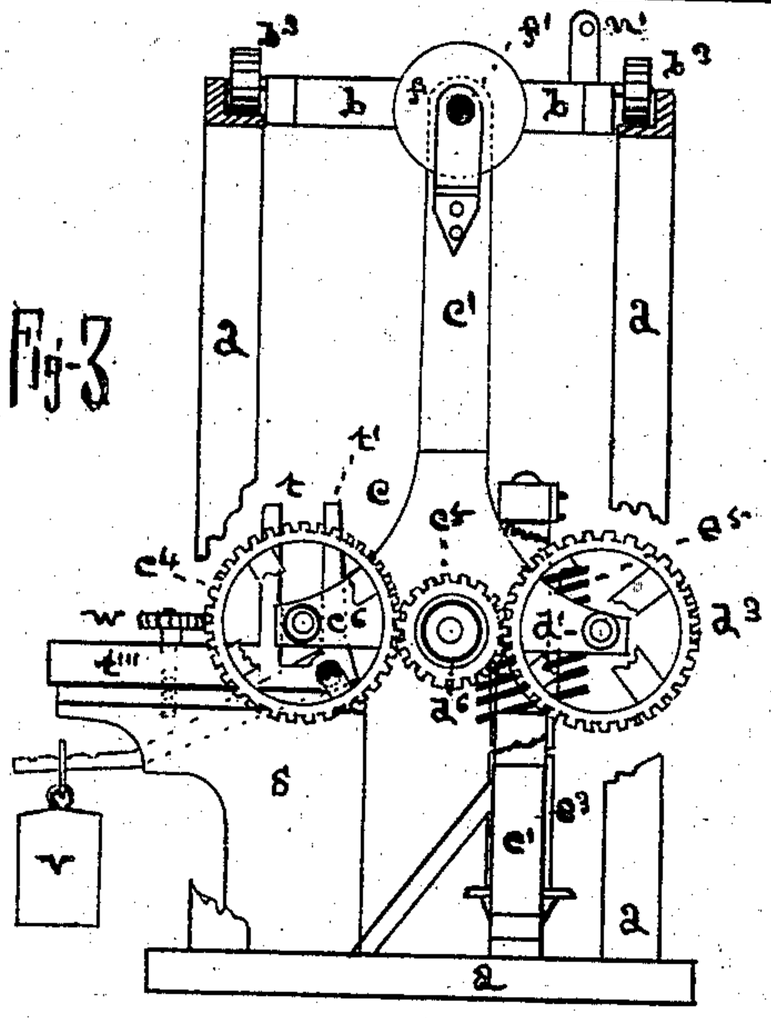


Fig-5.

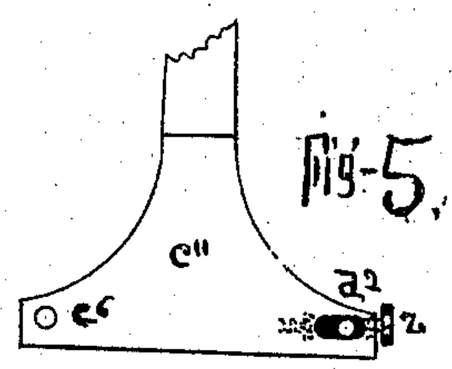
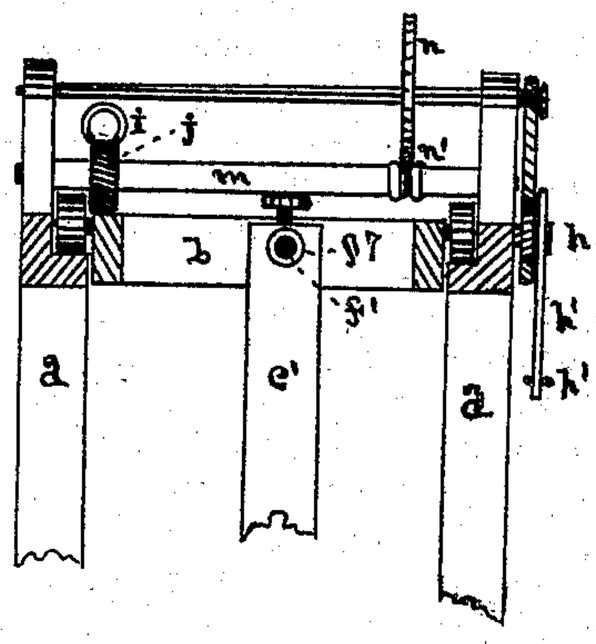


Fig-4



G. J. Parker.
O. P. Hyde.

Witnesses.

Geo. N. Westcott.
Inventor.

# UNITED STATES PATENT OFFICE.

GEORGE N. WESTCOTT, OF CORTLANDVILLE, NEW YORK.

## IMPROVEMENT IN LATHES FOR TURNING IRREGULAR FORMS.

Specification forming part of Letters Patent No. **171,201**, dated December 14, 1875; application filed November 2, 1875.

*To all whom it may concern:*

Be it known that I, GEORGE N. WESTCOTT, of Cortlandville, Cortland county, New York, have invented an Improvement in Lathes for Turning Irregular Forms, which I have described in the following specification, reference being had to the accompanying drawings.

The object of my invention is to render more accurate and efficient lathes for irregular turning; and this I accomplish by various means, the nature of which will be apparent as I describe them.

Figure 1 is a side elevation of my lathe, with portions of the frame and car cut away to show parts behind them. Fig. 2 is a view looking down on the top of my machine. Fig. 3 is a view of the middle portions of my machine, transversely through it, portions also being cut in section. Fig. 4 is a view of the feed device. Fig. 5 shows the slot for varying the taper of the cut of the blank, and Fig. 6 is a view of the slide-rod and tube for the car separated by themselves.

In Fig. 1, *a a a* is the supporting-frame, made by four posts, sills, and top timbers or beams, *a'*, which top beams are cut with grooves for the car-wheels, and *b* is the car, that, by the wheels $b^3$ in the grooves or chamfer cut in the top beams, runs the length of the wood blank to be cut; and *d* is the irregular blank to be cut or shaped in the lathe $d^1$, and held in it by the tail-screw $d^2$; and *e* is an adjustable cutter-frame, held in the jaws $e^1$, and adjusted perpendicularly by the set-screw $e^2$ beneath the frame. The cutters are saws, (of which four are seen in Fig. 1, and nine in Fig. 3,) which saws are on the mandrel $e^3$, driven by a belt rapidly from a pulley in any convenient position. A second source of power connects, by a belt from any convenient pulley, to the wheel $f'''$, which is loose on the slide-rod or revolving shaft $f'$. At $f'''$ is a clutch, by which this wheel is thrown into gear with the wheel $f^4$. By a belt the wheel $f^4$ is connected to the wheel *g*, shaft $g^1$, and screw *i*, which screw turns the wheel *j* and shaft *m*. On the shaft *m* lies loosely a rod, $n^1$, except when the wheel *n* is drawn on the rod by the eccentric at *h*, by the lever *h'* and rod *h''*, and hand-lever *q*, when the shaft *m* (see Fig. 4) moves the rod, and thus the car *b*, for the ends of the rod, are fast to the car by the studs $n^3$ and $n^4$. Thus the car is moved by machinery, and the blank *d* to the bank of saw-cutters $e^5$. But it is necessary to provide for the hand-feed, and the letters *r* designate that device; and *r* is a brace suspended from the front rail of the frame *a'*; and $r^1$ is a hand-crank, that turns the shaft and wheel $r^2$ on its top, and thus makes draft either way on the cord $r^3$, or chain, about the wheel, the ends of which cord or chain are fast to the studs $n^3$ and $n^4$. By this hand-crank the car and blank are moved rapidly (and the rod $n^1$ being detached from the lever *q*) independently of the mechanical feed. It is useful, also, in planing the flat parts of the blank, as guided by the pattern, and in certain cases to vary the blank from the pattern. A rack and pinion may be substituted for the cord and wheel. The hand-lever *q*, by the rod $h^3$ moves the lever $h^4$, Fig. 2, and thus the clutch $f'''$, as has been said, when the wheel $f^4$ revolves, and with it the slide-rod and shaft $f'$, to which it is fast. A groove is cut in this rod or shaft, as seen in Fig. 6, and has a pin or sliding key, *x*, Fig. 6, through the hub of the wheel *f* into the rod-groove, so that, be the car in any position, the shaft $f'$ turns the wheel *f* as soon as power is applied to the wheel $f^4$. This wheel *f* has a belt to the wheel $d^6$, between the lathe-wheel $d^3$ and its opposite fellow $c^4$ of the pattern-lathe, and, by being fast to the intermediate cog $c^5$, turns the wheels $d^3$ and $c^4$ and their lathes just alike. Thus the three motions are provided for—first, the driving of the saw-cutters $e^5$; second, the feeding of the blank, and its planing also; and, third, the turning of the lathes.

The saws are preferably true to each other on their general faces. They cut lengthwise, mainly, of the grain of the wood, and hence cut or plane, as desired. Such is their action that knots in the timber are cut perfectly smoothly, as no other cutters will do. I set them preferably obliquely. One or all the saws may be used in cutting, as is best or the work requires. Ordinary cutters cut across the grain of the wood, and require often to be sharpened; these need but little sharpening.

It will be noticed that from the car *b* two hangers, *c'* and *c''*, come down and hold the lathes on their ends. Rods $c^3$, of various

lengths, are put in to suit various patterns and blanks. The hanger $c'$ has a set-screw, $x''$; but this is not used for the changes of various patterns and blanks in the lathes. But the hanger $c''$ is changed on the tube-rod $f^7$, as seen better in Fig. 6, by the set-screw $x'$, so that the hangers are thus adjusted to the work to be done, while the car is unchanged. The revolving shaft $f'$ (see Figs. 2 and 6) goes through the wheel $f$ and the car-end $b^1$, and into the tube $f^7$, into which tube, Fig. 2, the rod extends to near the farther end of the tube when the car is retracted. The car and the hangers are for the purpose of a free motion to the cutter-saws. The tube $f^7$ is not fast to the ends of the car, but has a small oscillation on the end $b^1$ and on the set-screw $b^4$, Figs. 1 and 2. This is for the purpose of motion of the blank to and from the bank of saw-cutters, as controlled by the pattern. In Fig. 3 the rest $s$ for the pattern is seen to have two arms, which control the cut of the blank. One, $t$, holds and guides the cutting in one direction, and another, $t'$, controls the cutting in the other direction, yet closely hugs the pattern by the action of the weight $v$, and thus the pattern of any reasonable shape can revolve.

It is also apparent that the centers of the lathes $d^1$ and $c^6$ cannot vary in the lower ends of the hangers; yet it is necessary often to cut the whole blank $d$ either larger or smaller than the pattern. This is accomplished by the sliding base $t'''$, that holds the arms on the rest $s$. If this is slid from the saw-cutters the blank comes nearer the cutting-saws, and thus is cut to the size of, or smaller than, the pattern, and to any desirable degree. If moved toward the saw-cutters the blank is cut as large as, or larger than, the pattern. In practice I make my patterns larger than the article to be cut, because they are stiffer; their larger guiding-surfaces also cause a truer cut. This sliding and the set by the screw $w$, Fig. 3, adjust the size in the blank, be the size of the pattern what it may. This adjustment is not all; for example, in thills and poles for wagons the patterns may be correct in size and shape, but not in taper. Hence, I change this by making the blank-lathe tail-screw variable. In Fig. 5 it will be seen the tail-screw and its central point $d^2$ are in a slot in the metallic plate on the end of the hanger $c''$, and by the set-screw $z$ this tail-screw can be moved either toward, or more remote from, the cutting-saws, and thus the cutting of the blank will be with a taper either more or less than the pattern. The cutting-saws may be used as a solid bank of saws, or with collars separating them, as an open bank of saws; also oblique or at right angles to the mandrel.

While there are great advantages to have the hangers beneath the car, it is apparent that they may be as standards above the car, and yet oscillate on the central rod or tube $f^7$, or be at various angles to the car, and yet not lose their essential qualities. The other advantages, parts, and uses of my lathe and invention are apparent to those skilled in the art to which it appertains.

I claim—

1. The oscillating supports or hangers $c'$ and $c''$, for the cutting-lathe $d^1$ and the pattern-lathe $c^6$, in combination with a car, $b$, running on ways, substantially as set forth.

2. The feed apparatus or device, composed of the screw $i$, wheel $j$, and shaft $m$, in combination with the rod $n$ and car $b$, as set forth.

3. The hand-feed, composed of the devices $r$, $r^1$, $r^2$, and $r^3$, in combination with the car $b$ and hangers $c'$ $c''$, substantially as set forth.

4. The hand-lever $q$ and rods $h^3$ $h^4$, in combination with the clutch $f''$ and eccentric $h$, for throwing simultaneously the feed and the lathe motions in and out of gear, as described.

5. The slide-rod and revolving shaft $f'$, in combination with the tube $f^7$ and car $b$, as described.

6. The tube $f^7$, in combination with the car $b$ and hangers $c'$ $c''$, as set forth.

7. The combination of saw-cutters, the hangers or supporting-arms $c'$ $c''$, the oscillating tube $f^7$, and the adjustable tail-screw and center $d^2$, for cutting a taper in the blank either greater or less than that of the pattern, as set forth.

8. The sliding rest $t'''$, adjustable on the rest $s$, in combination with the weighted guide $t'$, for the purposes and uses set forth.

9. The car $b$, running on the rails or ways $a'$, and moved by the screw and pinion $j$, in combination with the hangers $c'$ $c''$, the lathe or pattern holder $c^6$, and the blank-lathe $d^1$, suspended from and beneath the car, in combination with the saw-cutters $e^5$ and pattern-guides $t$ $t$, operating as one machine, substantially as set forth.

10. The oblique or drunken saws or cutters $e^5$ on the mandrel $e^3$, in combination with the adjustable frame $e$ and set-screw $e^2$, whereby the saw or saws or cutters are adjusted to the blank $d$ in the lathe $d^1$, as set forth.

GEO. N. WESTCOTT.

Witnesses:

S. J. PARKER,

O. P. HYDE.