(No Model.) 3 Sheets—Sheet 1.

DE WITT C. SMITH & S. E. SMITH.

LATHE FOR TURNING POLYGONAL FORMS.

No. 321,762. Patented July 7, 1885.

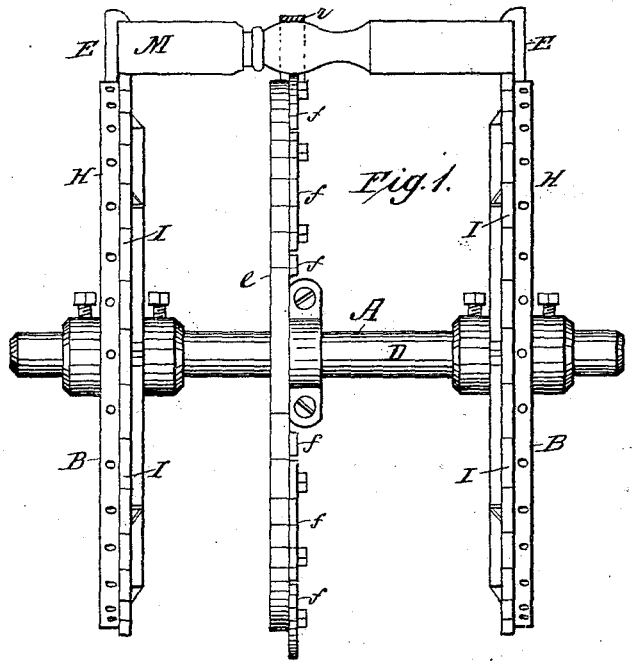


Fig. 1.

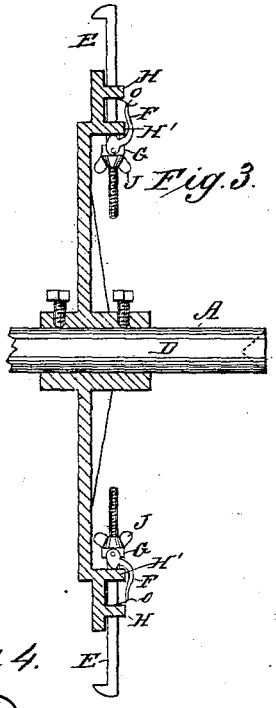
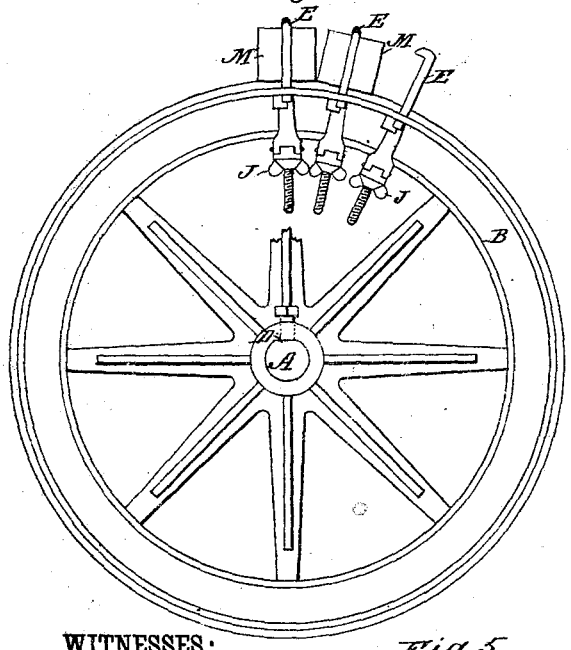


Fig. 3.

Fig. 4.

Fig. 2.



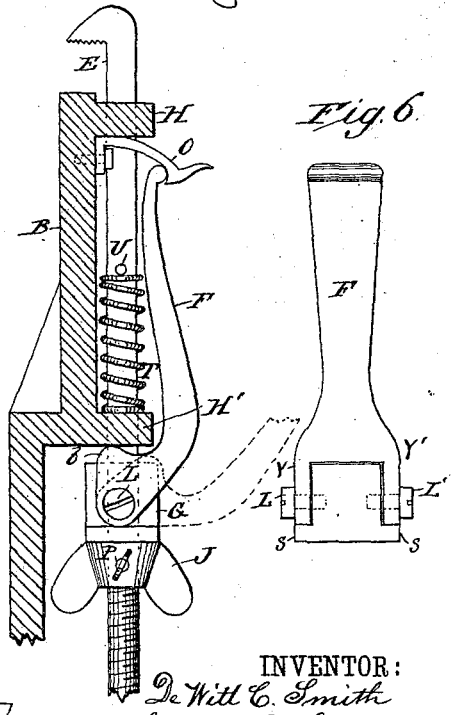


Fig. 6.

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Fig. 5.

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(No Model.) 3 Sheets—Sheet 2.

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Fig. 7.

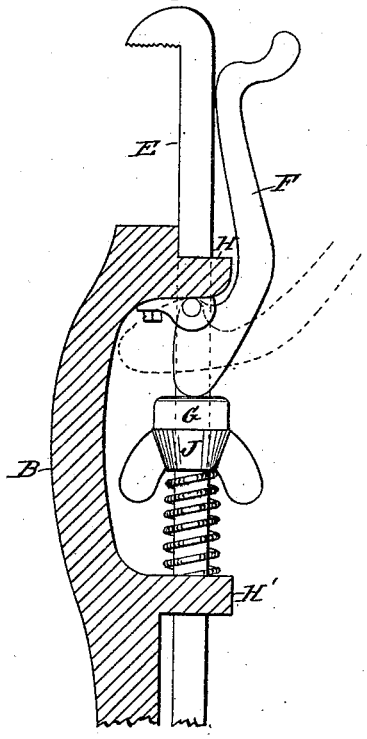

Fig. 8.

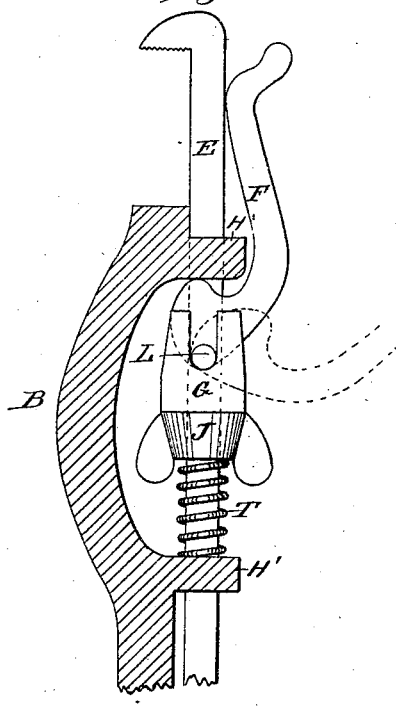

Fig. 9.

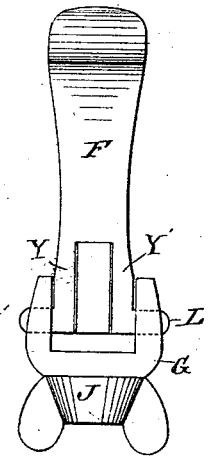

Fig. 10.

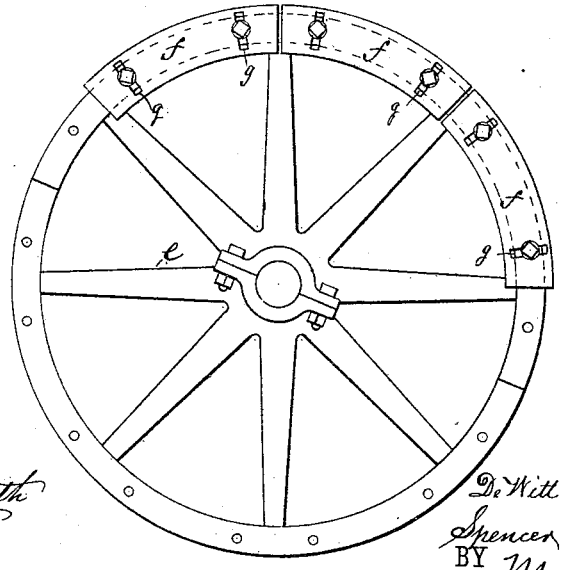

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Fig. 12.

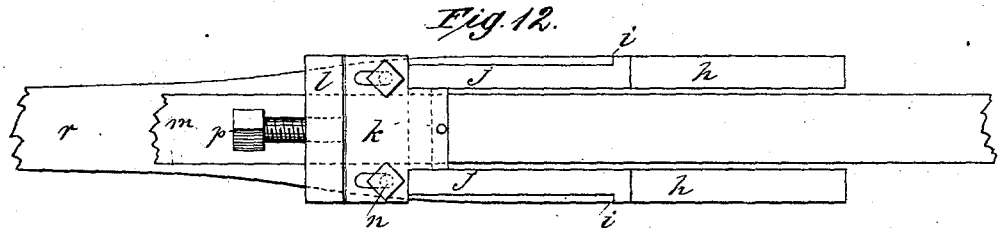


Fig. 11.

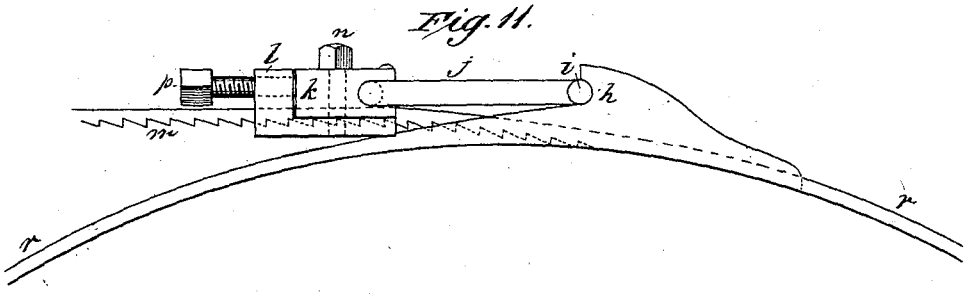


Fig. 13.

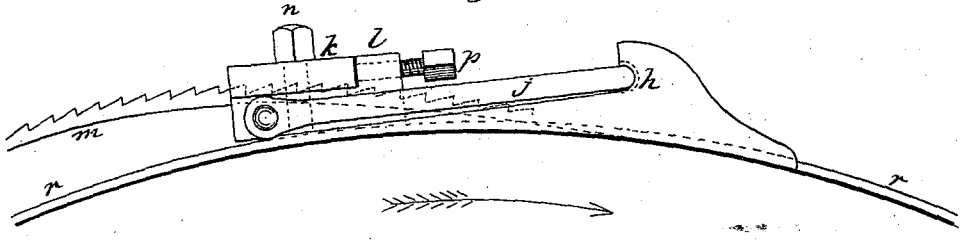
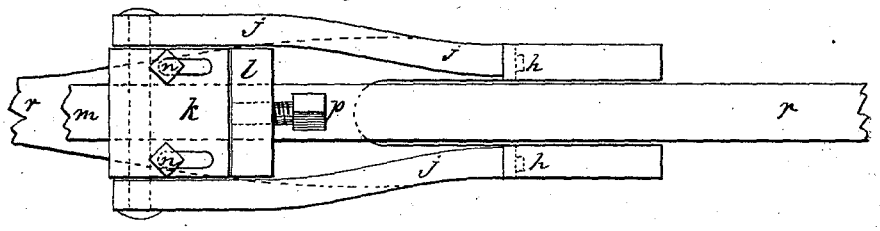


Fig. 14.



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UNITED STATES PATENT OFFICE.

DE WITT C. SMITH AND SPENCER E. SMITH, OF ST. PAUL, MINNESOTA.

LATHE FOR TURNING POLYGONAL FORMS.

SPECIFICATION forming part of Letters Patent No. 321,762, dated July 7, 1885.

Application filed December 17, 1884. (No model.)

To all whom it may concern:

Be it known that we, DE WITT C. SMITH and SPENCER E. SMITH, citizens of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Turning-Lathes, of which the following is a description.

This invention relates to that class of turning-lathes used for making many-sided objects—such as stair-newels, piano-legs, &c.; and the object of the invention is to quickly adjust the machine to receive timbers of different lengths or thickness, to quickly clamp such timbers upon the machine, and to quickly remove them after the work on them is done.

To this end our invention consists in the construction and combination of parts forming a portion of a turning-lathe hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a portion of a turning-lathe, showing our invention. Fig. 2 is an end view of the same. Fig. 3 is a longitudinal section of the same. Fig. 4 is an enlarged detail partly in section. Fig. 5 shows a segment of a wheel with means for holding timbers having more than four sides. Fig. 6 is a face view of the lever F. Figs. 7, 8, and 9 show modifications of the parts shown in Fig. 4. Fig. 10 is a side elevation of a middle wheel. Figs. 11 and 12 show a modification of the hoop-clamp. Fig. 13 is a side elevation of a middle band-clasp, and Fig. 14 is a plan view of the same.

A represents a shaft having a flattened side, D. B B are two wheels, each having an outer rim, H, and an inner rim, H'. The periphery of each wheel is a polygon of any given number of sides, I—say thirty-two—each side being as wide as the largest timber M to be shaped on it; or it may be round, if very large. The rims H and H' project from the outer faces of the two wheels, and have radial holes through which the shanks of the clamp-hooks E may slide freely. Each hook is placed opposite the center of a flat side, I, to hold a square timber, M, thereon, and the under side of the hook is roughened or toothed to hold the timber more firmly. The inner end of hook E is screw-threaded, and a thumb-nut, J is fitted thereon.

P is a set-screw adapted to bind the nut J to the shank of hook E at any point.

G is a block fitted loosely upon the shank of hook E, to rest against the nut J, and to serve as a bearing for the forked lever F, which is pivoted thereto by means of two screws, L L'. The block G is further provided with shoulders S. The inner ends of the fork Y Y' are circular arcs from the pivot-screws L L' as centers, to bear on the shoulders S.

b is a cam-shaped knob on the lever F, acting against the inner side of the rim H when the lever is fastened outward, as shown, to press against the nut J and draw the hook E toward the center of the wheel.

O is a snap-hook to retain the lever F.

T is a spiral spring acting between the rim H' as an abutment and the pin U in hook E, to continually press the latter outward, so that when the lever F is thrown loose, as shown in dotted lines, Fig. 4, the spring will force the hook outward, permitting the removal of the timber which has been held thereby, and the insertion beneath the hook of another timber; or permitting the first timber to be freed and turned onto its different sides.

In setting the nut J for any size of timber the timber is first put in place, then the lever F is secured by hook O, then the nut is turned until the hook is drawn tightly on the timber, and, finally, the set-screw P is fixed. Now, by operating the lever F the hook will be moved enough to free or to secure all timbers M of the size prepared for.

The two rims H and H' being some distance apart serve as guides to maintain the hook in line against the usual tendency to tip over back when forced upon the timber, and they hold the hook rigidly against the great tangential strain on the timber when being cut.

The operation of cutting or shaping the timbers consists in rapidly revolving a wheel filled on its circumference with timbers against fixed or revolving blades. Therefore there is great tendency to tear the timbers loose from the wheel when in operation.

In the modification shown in Fig. 7 the screw-nut J has been placed directly against the spring T, and the lever F is pivoted to the rim H to act with its outer end against the block G to bring the hook E into service, and to be relieved when thrown down, as shown in dot-

ted lines. In this case the block G might be a mere washer. In the modification shown in Figs. 8 and 9 the screw-nut J is also placed directly against the spring T; but the lever F is pivoted in the block G, to act with its cam end against the rim H. In this case the shoulders S on block G are dispensed with, the inner end of the lever being either cylindrical or cam-shaped to act on a suitable bearing in the block, the pins L on which the lever is pivoted being fitted to rise in slots in the sides of block G. The end of the lever is bifurcated at Y to straddle the screw. There might be various other equivalents of this hook-clamping mechanism shown, but enough modifications are shown to illustrate the principle of the invention.

We are aware that a simple screw inserted into the periphery of a single rim and having a washer loose on the screw to rest on the timbers is old; but this screw and washer have not the elements of stability and adjustability which our double-stayed screws have, and we do not claim such screws and loose washers as our invention.

N N represent forked seats shaped to receive timbers of more than four sides, for the reason that the larger the number of sides the narrower will each side be until, in timbers having six or more sides, each side would furnish too narrow a base for the timber to be held firmly thereon against tangential or rolling strain. The seats N are adapted to receive a corner and two sides of each timber or a side and two corners, (see Fig. 5,) thereby giving it a firm base. Each seat is provided with two or more dowels, *e*, to engage holes in the periphery of the wheel.

Our hooks E might be operated, though more slowly, by means of the screw-nut J and spring T without the aid of the lever F. In some cases, when turning small timbers, they spring and chatter under the action of the cutting-tools, thereby being damaged, and sometimes endangering the tools and workmen. To obviate this we provide one or more wheels, *e*, parted through the center to be clamped upon the shaft A, to serve as midway supports to the work. To adjust these wheels to variations in the contour of the timber, we have provided each wheel *e* with segments *f*, having radial slots *g*, engaged by set-screws to hold them to the wheel. The timber being first made fast at its ends, the segments *f* are pressed outward against it and fastened. This forms a firm central seat for the timbers. To hold this central portion securely upon the wheel *e*, we provide an adjustable band, *r*, to surround the timbers, and to be bound firmly thereon, being set to one side when the ring which it occupies is to be turned. One end of the hoop is bifurcated to receive the other end, and is provided with two hooks, *h*, to be engaged by the trunnioned ends *i* of a stirrup, *j*, which stirrup is hung in a block, *l*.

k is a slide having a series of notches engaging similar notches on the end *m* of the band *r*. The slide *k* is provided with slots, through which screw-bolts *n* pass to secure it to the block, and the latter is provided with an adjusting-screw, *p*, to act between the block and slide to strain the hoop. The operation is as follows: The band being placed around the timbers and the trunnions *i* being engaged with the hooks *h*, the end *m* of the band is pressed down to place. As the band draws on the stirrup in a line below the trunnions *i*, the stirrup and the end *m* of the hoop will be held on the timbers. Now, by turning the screw *p* the hoop may be strained as tightly as necessary.

The hoop could be used without the screw *p*, though the adjustment could not be made so accurately.

The end *m* of the hoop, if projecting far through the block, can be held down by a loop or hook or other suitable means.

What we claim as new is—

1. The combination, with the shaft A and the wheels B fixed thereon, and the middle wheels, *e*, fitted to the shaft A, of an adjustable hoop securable around the wheels *e* over timbers thereon, substantially as and for the purpose described.

2. The combination, with a turning-lathe, of the band *r*, having notches at one end, *m*, and bifurcated and provided with hooks *h* at the other end, the stirrup *j*, having trunnions *i*, to engage the hooks *h*, and pivoted in a block, *l*, the slide *k*, having notches in it adapted to engage the notches in the hoop, and secured to the block *l*, substantially as shown and described.

3. The combination, with a turning-lathe, of the band *r*, having notches at one end and bifurcated and provided with hooks *h* at the other end, the stirrup *j*, having trunnions *i*, to engage the hooks *h*, the block *l*, pivoted to the hooks *h*, the slide *k*, having notches in it and adjustably secured to the block *l*, and the screw *p*, acting between the block and slide, substantially as shown and described.

4. The combination, with the shaft A, the wheels B, and the radially-perforated rims H and H′, of the hooks E, having shanks fitted to slide in the perforated rims, and screw-threaded, the screw-nuts J, and the springs T, as and for the purpose specified.

5. The combination, with the shaft A, the wheels B, and the radially-perforated rims H and H′, the hooks E, having shanks fitted to slide in the perforated rims, and screw-threaded, the screw-nut J, and the springs T, of the blocks G, having shoulders S, the lever F, having arms Y Y′ pivoted to block G and adapted to engage the shoulders S, and the rim H′, and the retaining-hook O, as and for the purpose specified.

6. The combination of the shaft A, the wheels B secured thereon and provided with a series of faces, I, and dowel-holes, the forked seats N, provided with dowels *e*, fitted to register

with the said dowel-holes, and means, substantially as described, for holding timbers thereon, as and for the purpose specified.

7. The combination of the wheels B, each having two projecting rims, H and H′, provided with radial holes registering with each other, the hooks E, each having a shank fitted to slide radially through two of the said rims, the spring T, acting between each hook and a fixture of the said wheel to force the hook outward, the nut J, screw-threaded on the hook-shank, the block G on the hook-shank, and the lever L, pivoted to the said block G and provided with a cam, *b*, to act against one of the wheel-rims, substantially as shown and described.

8. The combination, with the shaft A and the wheels B fixed thereon, of the parted clamp-wheel *e*, fitted to the shaft A, and the radially-adjustable segments *f* on the wheel *e*, substantially as shown and described.

9. The combination, with the shaft A, the wheels B secured thereon, and the clamp-wheel *e*, removably fitted to the shaft, and provided with radially-adjustable segments *f*, of an adjustable hoop securable around the wheel *e* over work thereon, substantially as and for the purpose specified.

DE WITT C. SMITH.
SPENCER E. SMITH.

Witnesses:
CHAS. H. WILLIAMS,
F. C. BURGESS.