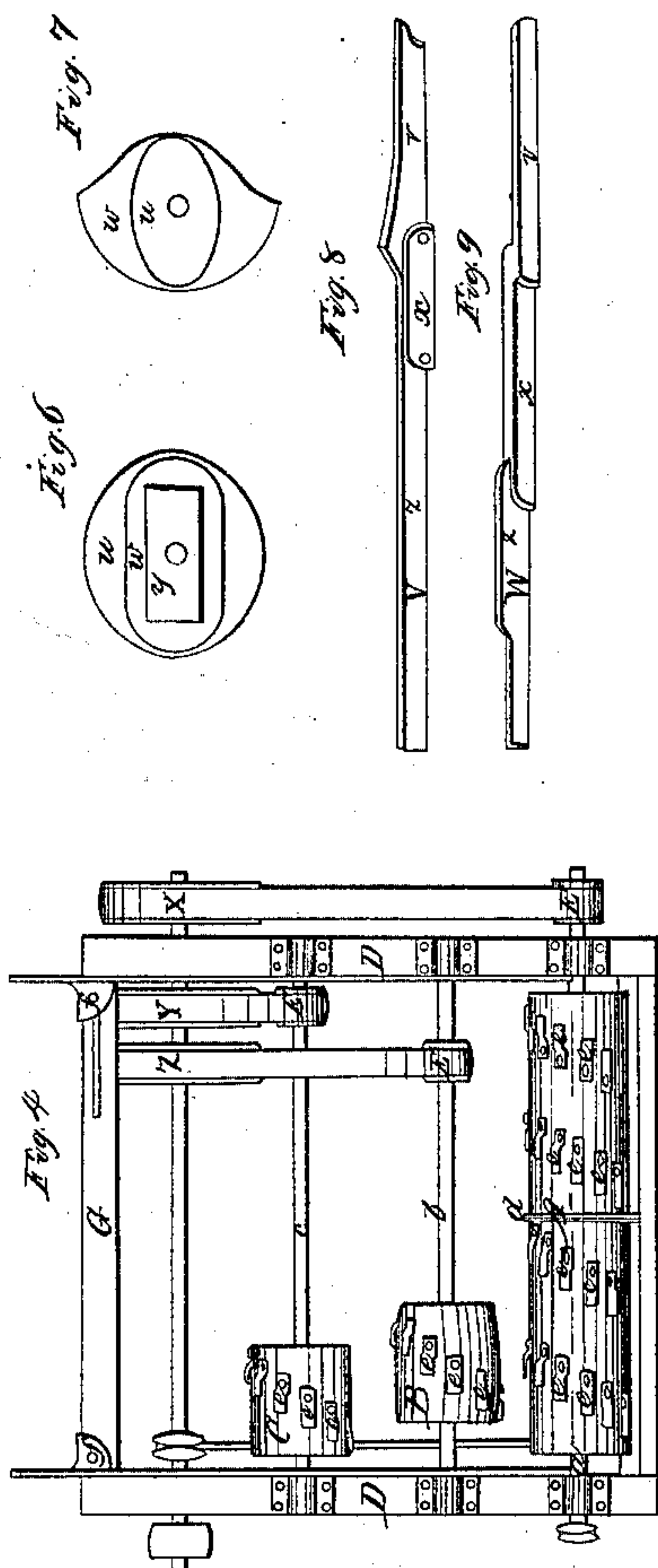
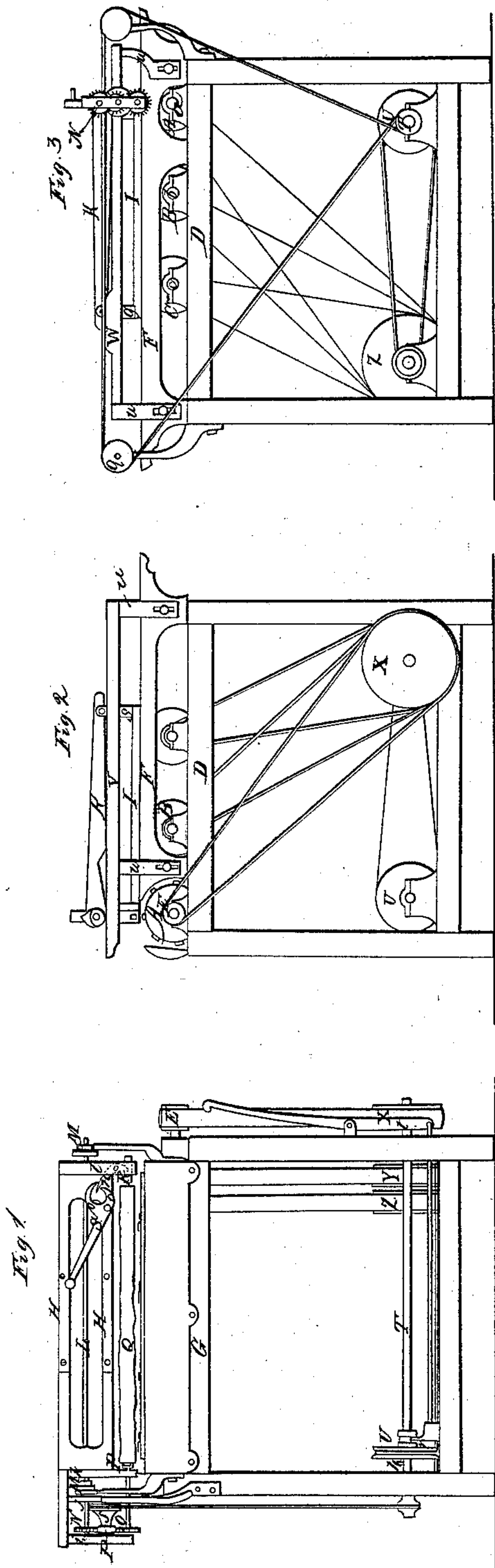


*P. S. Beers*

*Turning Irregular Forms.*

*No 7937*

*Patented Feb. 18, 1851.*





# UNITED STATES PATENT OFFICE.

PHILO S. BEERS, OF HAMDEN, CONNECTICUT.

## MACHINE FOR TURNING IRREGULAR FORMS.

Specification of Letters Patent No. 7,937, dated February 18, 1851.

*To all whom it may concern:*

Be it known that I, PHILO S. BEERS, of Hamden, in the county of New Haven and State of Connecticut, have invented a new and useful Machine for Manufacturing Carriage-Wheel Spokes and other Similar Articles; and I hereby declare that the following is a full and exact description of the construction and operation of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a front elevation; Fig. 2 is a transverse elevation of the right end of the machine; Fig. 3 a transverse elevation of the left end of the same; Fig. 4 is a horizontal section, showing the form and position of the cutter-cylinders and driving belts; Fig. 5 is a vertical view of the sliding carriage; Figs. 6 and 7 represent two compound cams, as seen from the right; and Figs. 8 and 9 are perspective views of the two cam-rails.

The several parts of the machine are designated by the same letters in all the different drawings.

The nature of this invention consists in such a combination and arrangement of various mechanical devices, in one machine, that a piece of rough timber of convenient size, being adjusted therein, and subjected to the action thereof, is quickly reduced to the complete form of a carriage-wheel spoke (or such similar article as may be required) and that without any lateral or longitudinal motion of either the cutters or of the rough material.

Three cylinders A B C, are mounted upon three horizontal shafts *a b c*, which have their bearings upon the two upper side-beams (D D) of a square frame, which consists of four posts connected by nine horizontal beams. The surfaces of the three cylinders are furnished with cutters *e e*, which are so arranged that no two cutters will take to the rough material at the same time. The surfaces of the cylinders are not straight, or, otherwise, the cutters are adjusted at unequal distances from the axles of their respective cylinders, and are made to vary in a manner to favor the production of the peculiar form required. A narrow hoop or flange *d* extends around the long cylinder A, and serves to prevent the rough material from approaching so near the cylinder as to allow the cutters thereof to cut too rankly. The cutter-shafts are furnished

with pulleys (E E E) to receive the bands by which they are put in motion. A pair of ways or guide-rails F F, are adjusted above the frame, and are supported by two of the upper cross-beams G G. Each guide-rail has two horizontal feet *f f*, which are attached to the cross-beams by set-screws; the two cross-beams being furnished with longitudinal slots through which the set-screws pass, the distance between the two guide-rails may be regulated as occasion may require. Upon these guide-rails is mounted a sliding carriage, (see Fig. 5) consisting of a vertical head-frame, (H *i j k l*) two horizontal slides I I, two adjustable cross-bars J J, and undulating rods K K, the rear ends of which are connected to two small studs *g g*, which are attached to the slides. The cross-bars J J, and front bars H H, are each composed of two parts which are connected by means of set-screws which pass through the slots *m*, that the breadth of the sliding frame may be adjusted as circumstances require. To the head-frame are attached four hangers *i j k l*; and a horizontal cam-shaft L has its bearings in these hangers, and extends beyond the head-frame on the right, far enough to receive and support one of the compound cams M M. The other cam is mounted upon the cam-shaft between the hangers *j* and *k*; and upon the left end of this shaft, is mounted the gear-wheel N. Another equal gear-wheel O, is mounted upon another shaft, directly under and parallel to the cam-shaft, and which has its bearings in the hangers *i* and *k*. To the right end of this shaft, is attached a spur chuck (or swallow's tail P, which is furnished with projecting spurs for holding one end of the rough material Q, the other end of which is supported by the centerpoint of a sliding center-bar R. This center-bar is occasionally moved to the right or left, by means of a bent lever *n* and hand lever S. The lower end of the bent lever (which is partly represented by dotted lines) enters a notch in the top of the center-bar, and the upper end thereof passes between the two branches *o o* of the hand lever. The left end of the hand-lever is furnished with a knob or handle, and has sufficient weight to cause the lever *n* to press the center-bar against the rough material.

The gear-wheels N and O are connected by a small center wheel or pinion *p*, upon the axle of which is a pulley *s*, over which



passes a band which also passes over two conducting pulleys *q q*, and a driving pulley which is mounted upon the left end of a horizontal shaft *T*. Upon this shaft, near  
 5 the left bearing thereof, is mounted a band-wheel *U*, from the left side of which projects a pin *h*, which occasionally clutches to a pin which projects from the shaft; otherwise the wheel turns freely upon the shaft.  
 10 In the hub of this wheel, on the right thereof, is a groove which receives the end of the arm *r*, which is attached to, and projects from a sliding block, which slides upon a horizontal rod, parallel to the shaft *T*. To  
 15 this block is attached another rod which extends to the right, and is connected to the bottom of a vertical hand-lever *t*, by means of which the wheel *U* is conveniently clutched or relieved.  
 20 To the outside of the guide-rails are attached four posts *u u*, which are adjustable by means of slots and set-screws near the bottoms thereof. To the heads of each pair of adjustable posts, is attached a cam-  
 25 rail, *V* and *W*, (see Figs. 8 and 9). The cams *M M* rest upon these cam-rails; and the head-frame, with its gear-wheels and rough material, is thereby sustained; the vertical position of the latter being governed  
 30 by the positions of the cams upon the rails. Near the rear posts of the frame is a driving shaft on which is mounted the driving wheels *X Y Z*; and on the left end thereof is a pulley to receive a band by which the  
 35 machine is put in motion. One of the horizontal slides *I* is grooved in the under side thereof, whereby it is guided upon the rail. In front of the cylinder *A* is a curved shield or fender, to protect the operator from the  
 40 detached chips.

Operation: A piece of timber of convenient size being adjusted upon the spurs and center point, and the machine being put in motion, the sliding frame is moved rear-

ward by the hand of the operator till the 45 position of the rough material is over the cylinder *A*, where it remains till the timber has revolved at least once, during which time, the shoulders *u u* of the cams, rest upon the sections *v* of the cam-rails. The 50 sliding frame is then moved back till the timber is subjected to the action of the cutters of the cylinder *B*, during which the shoulders *w* of the cams, rest upon the sections *x* of the cam-rails, whereby a tilting 55 motion of the timber is produced, and the timber is reduced to the peculiar form required in spokes, near the square tenon. The timber is next subjected to the action of the cylinder *C*, while the cam-shoulders 60 *u* and *y* rest upon the sections *z* of the cam-rails, by which the square tenon on the left end of the timber is formed. By employing cylinders, cams and cam-rails of slightly different forms from those herein described, 65 axe-helves and other similar articles may be made.

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

1. The three cutter cylinders *A, B, C*, 70 (with cutters arranged as within described,) in combination with the sliding frame, compound cams and cam-rails, constructed and arranged substantially in the manner, and for the purpose herein described. 75

2. I claim the combination of the compound cams, and cam-rails, with the sliding frame and devices (within described) for holding and revolving the timber material, whereby such vertical motion is produced in 80 the latter, while being subjected to the action of revolving or vibrating cutters, as to reduce the timber to the required form.

PHILO S. BEERS.

Witnesses:

R. H. COOPER,  
 ALFRED GOODYEAR.