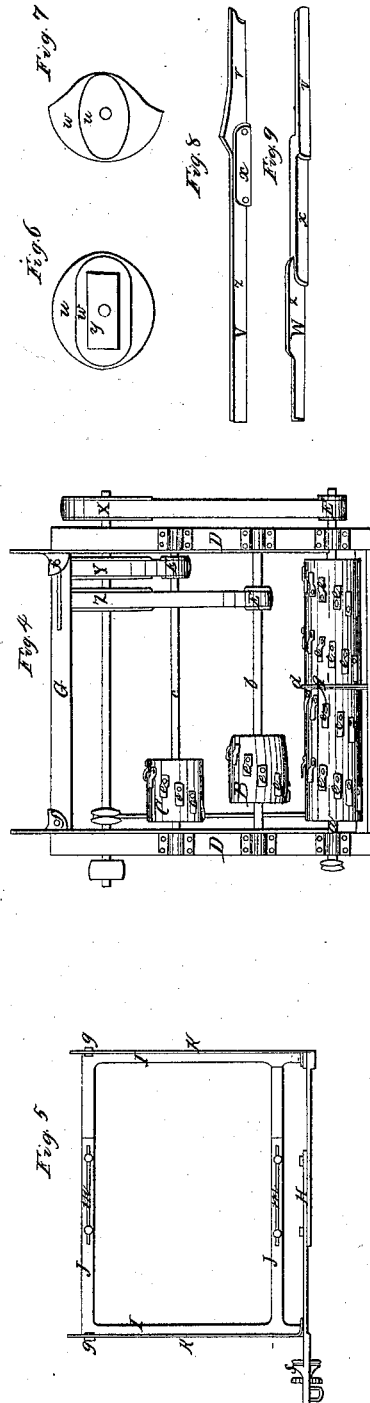
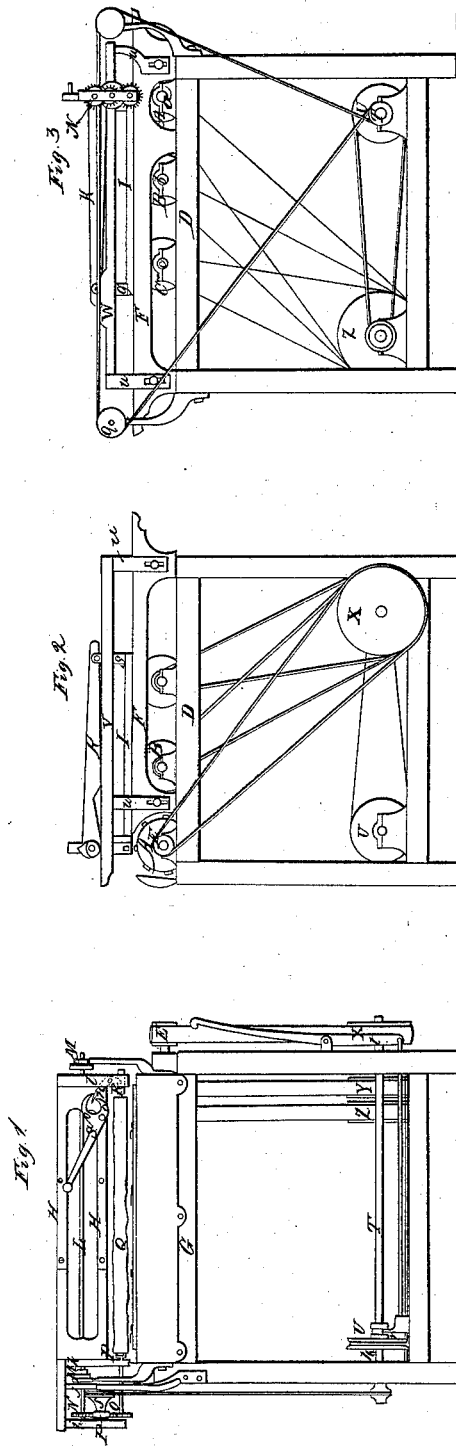


P. S. Beers

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 pro-
jects a pin *h*, which occasionally clutches to
a pin which projects from the shaft; other-
wise the wheel turns freely upon the shaft.
10 In the hub of this wheel, on the right there-
of, 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 *z*, by means
of which the wheel *U* is conveniently
clutched or relieved.
20 To the outside of the guide-rails are at-
tached 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 hori-
zontal 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 conveni-
ent 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 cut-
ters of the cylinder *B*, during which the
shoulders *w* of the cams, rest upon the sec-
tions *x* of the cam-rails, whereby a tilting 55
motion of the timber is produced, and the
timber is reduced to the peculiar form re-
quired 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, com-
pound 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 com-
pound 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 re-
duce the timber to the required form.

PHILO S. BEERS.

Witnesses:

R. H. COOPER,
ALFRED GOODYEAR.