

H. KEAN.
Lathe for Turning Masts and Spars.
No. 203,920. Patented May 21, 1878.

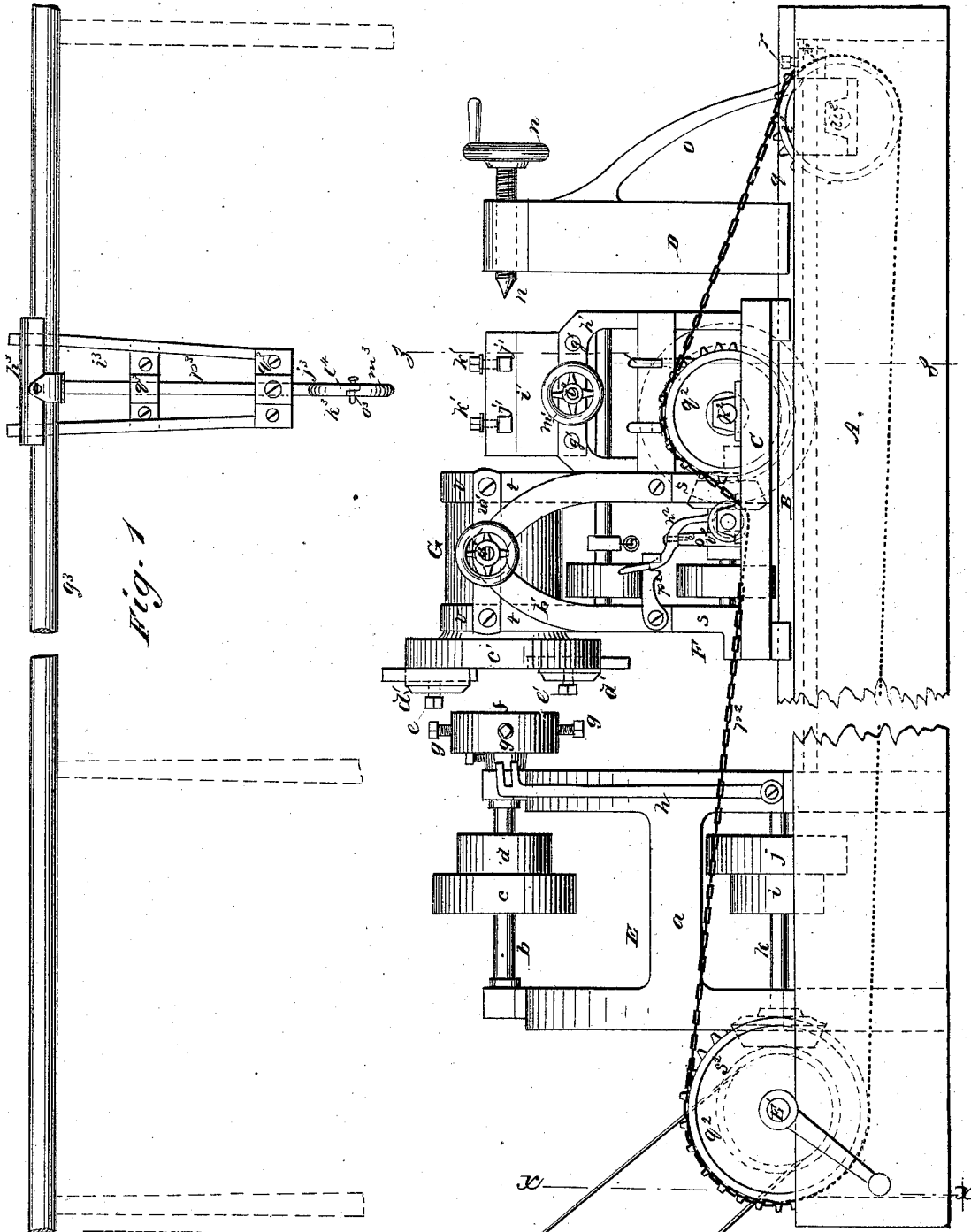


Fig. 1

WITNESSES:

C. Newell
C. Sedgwick

INVENTOR:

H. Kean

BY

Munn & Co.

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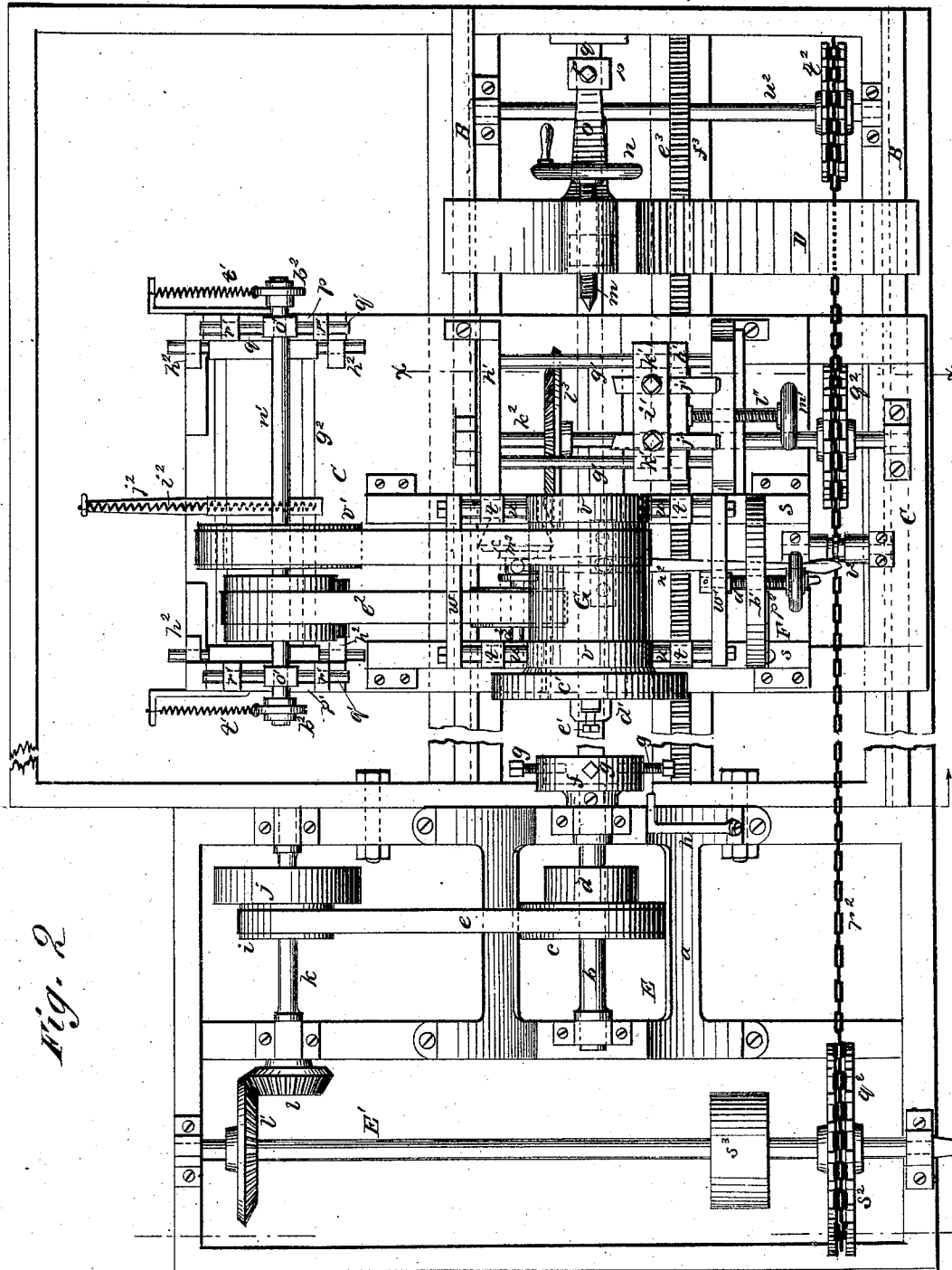


Fig. 2

WITNESSES:
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Fig. 3

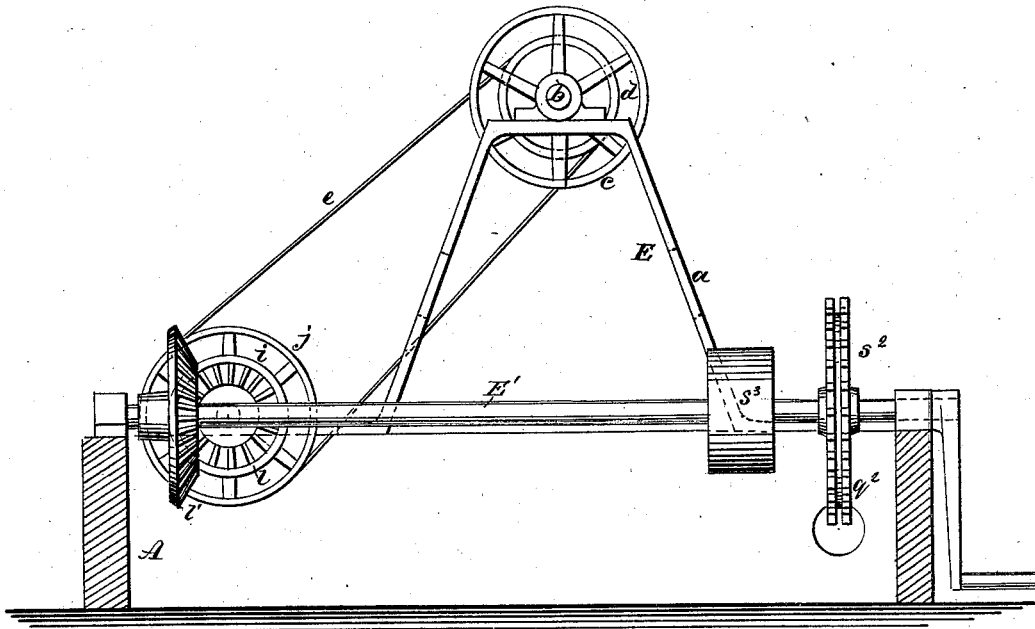
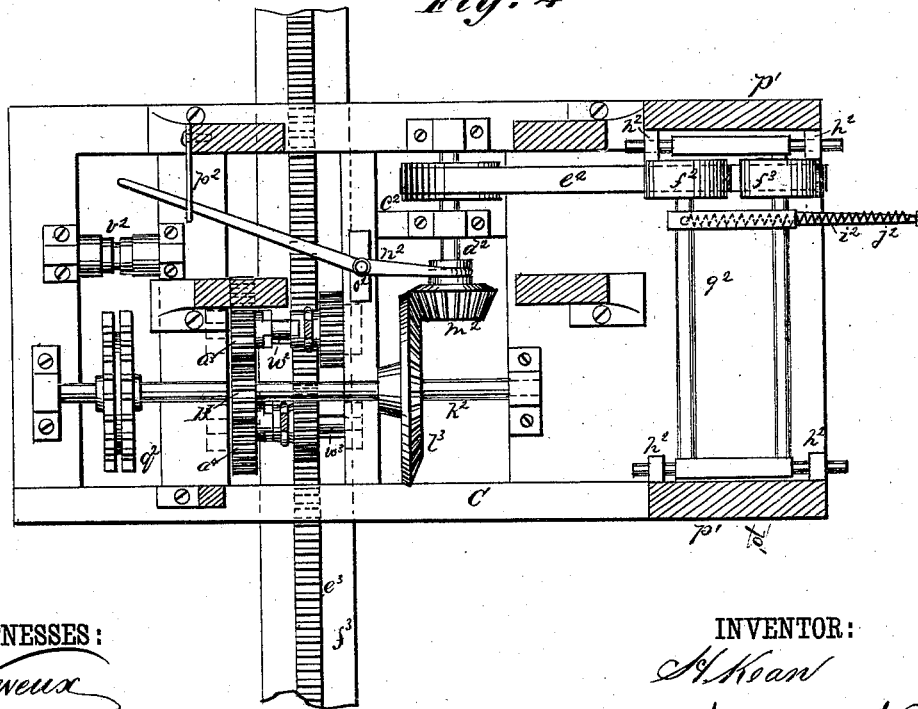


Fig. 4



WITNESSES:

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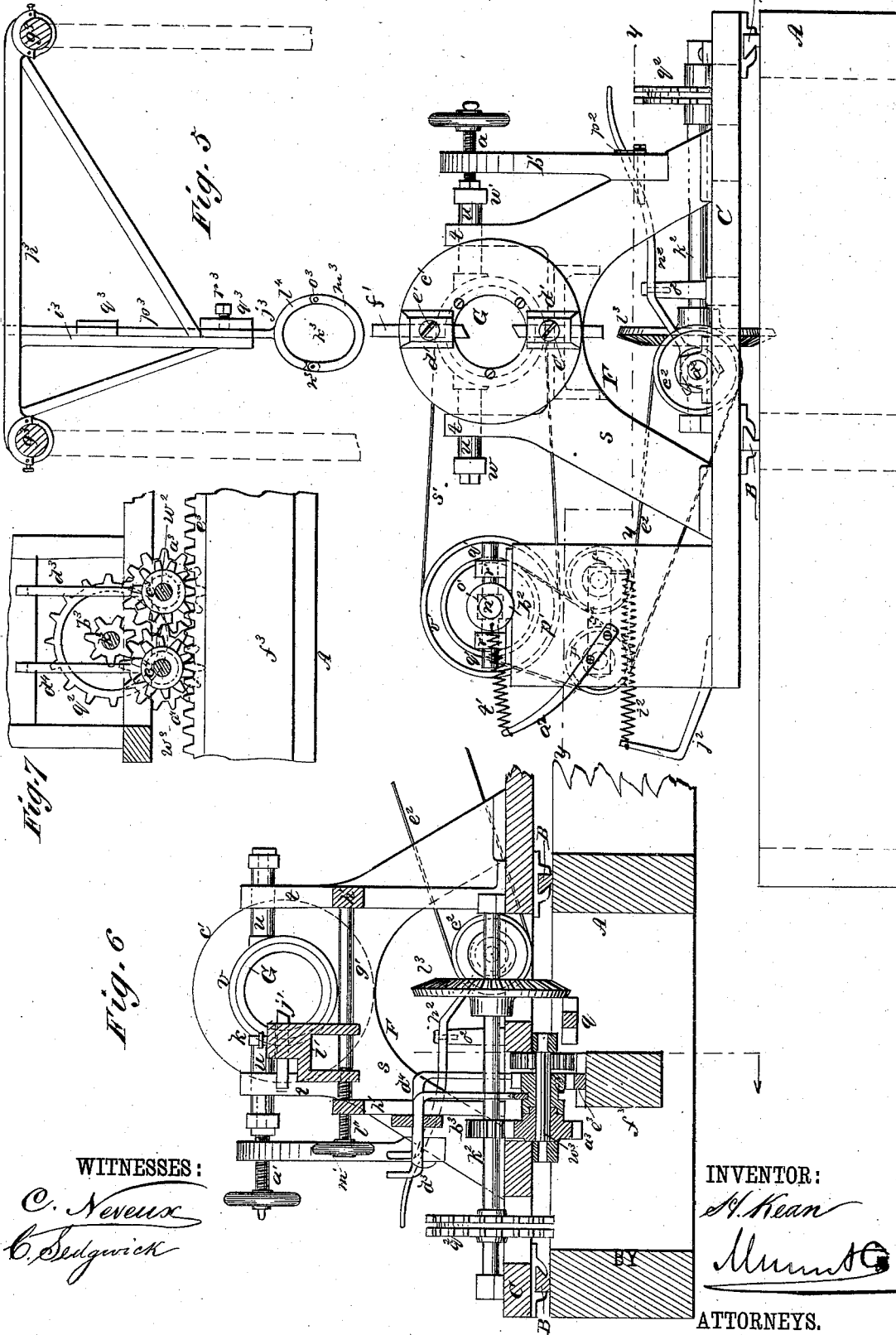


Fig. 7

Fig. 6

WITNESSES:
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UNITED STATES PATENT OFFICE.

HENRY KEAN, OF EAST BOSTON, MASSACHUSETTS.

IMPROVEMENT IN LATHES FOR TURNING MASTS AND SPARS.

Specification forming part of Letters Patent No. 203,920, dated May 21, 1878; application filed January 24, 1878.

To all whom it may concern:

Be it known that I, HENRY KEAN, of East Boston, in the county of Suffolk and State of Massachusetts, have invented a new and Improved Lathe for Turning Masts and Spars, of which the following is a specification:

Figure 1 is a front elevation of my improved lathe. Fig. 2 is a plan view. Fig. 3 is a vertical section taken on line *xx* in Fig. 1. Fig. 4 is a horizontal section taken on line *yy* in Fig. 5, looking downward. Fig. 5 is a side elevation of the hollow mandrel and its driving mechanism. Fig. 6 is a vertical section taken on line *zz* in Fig. 1. Fig. 7 is a detail view of the feeding-gear.

Similar letters of reference indicate corresponding parts.

The invention will first be described in connection with the drawing, and then pointed out in the claims.

Referring to the drawing, A is the bed-frame of the machine, upon which all of the parts of the latter are mounted. Ways B are secured to the bed for receiving the tool-carriage C and the tail-stock D. Upon the frame A, at the end of the ways B, the head-stock E is mounted, which consists of the frame *a*, in which is journaled the mandrel *b*, which is provided with two pulleys, *c d*, for receiving the driving-belt *e*. The mandrel *b* has a conical center, and is provided with a shell chuck, *f*, which is of sufficient size to receive the end of the log, and is provided with adjusting-screws *g*, by which the log is centered. A stop, *h*, is pivoted to the frame *a*, and is slotted to receive one of the screws *g* when it is desired to prevent the mandrel from turning.

The mandrel *b* takes its motion from the pulleys *i j* on the shaft *k*, that is journaled in the frame A, and takes its motion, through bevel-gear *l l'*, from a shaft, E', journaled in the frame A at right angles to the shaft *k* and mandrel *b*.

The tail-stock D is mounted on the ways B, and is provided with an ordinary tail-spindle, *m*, which is turned, when forced into the log, by the hand-wheel *n*. A brace, *o*, is attached to the tail-stock, and has formed on its lower end a sleeve, *p*, for receiving the rod *q*, which

is supported by the frame A parallel with the ways B. The sleeve *p* is provided with a binding-screw, *r*, by which the tail-stock may be secured in any desired position. Upon the carriage C a frame, F, is mounted, which consists of two connected side pieces, *s*, each provided with two standards, *t*, which are apertured to receive the trunnions *u* of the journal-boxes *v*. These trunnions are connected at the rear of the frame F by a bar, *w*, and at the front of the said frame by a bar, *w'*, in which is swiveled an adjusting-screw, *a'*, that turns in a nut formed in the standard *b'*, that is secured to the front of the frame E. A hollow mandrel, G, is supported by the journal-boxes *v*; and is provided with a face-plate, *c'*, which carries two tool-holding sockets, *d'*, which are each provided with a set-screw, *e'*, for clamping the tool *f'*.

Ways *g'* are supported by the frame *h'* at the end of the hollow mandrel opposite the face-plate *c'*, for supporting the tool-holder *i'*, which is apertured to receive the tools *j'*, and is provided with set-screws *k'*, for clamping the said tools.

A screw, *l''*, is swiveled in the tool-holder *i*, and passes through a threaded hole in the front of the frame *h'*, and is provided with a hand-wheel, *m'*, by which it is turned to adjust the tools to the work.

Behind the frame F a shaft, *n'*, is journaled, and adjustable boxes *o'*, supported by standards *p'*, that are attached to the carriage C.

The boxes *o'* are provided with trunnions *q'*, that are placed in guides *r'* secured to the top of the standards *p'*.

The boxes *o'* are capable of sliding in their supports as the hollow mandrel G is moved by the screw *a*; and the belt *s'*, which passes around the hollow mandrel and around the pulley *v'* on the shaft *n'*, is made tight by springs *t'*, that are attached to rearwardly-projecting arms *a''* and to loose collars *b''*, placed on the ends of the shaft *n'*.

The shaft *n'* takes its motion through a belt, *e''*, from a pulley, *e''*, on the shaft *d''*, journaled in the carriage C. The belt *e''* runs under the tightening-pulleys *f'' f''*, which are journaled in a movable frame, *g''*, which is supported by

guides h^2 , attached to the standards p^1 , and drawn back by a spiral spring, i^2 , one end of which is attached to the frame, and the other end to an arm, j^2 , that projects from the carriage C.

The shaft d^2 takes power from a shaft, k^2 , which is journaled in the carriage C, through the bevel-wheel l^3 on the shaft k^2 and the pinion m^2 on the shaft d^2 .

The shaft d^2 is capable of sliding longitudinally in its boxes, and the collar of the pinion m^2 is grooved circumferentially to receive a shifting-lever, n^2 , that is fulcrumed on a stud, o^2 , and projects forward under the frame F, and is capable of being moved so as to throw the pinion m^2 into or out of gear with the bevel-wheel l^3 .

The shaft k^2 is provided with a chain-wheel, q^2 , which takes power through the chain r^2 , which passes around a chain-wheel, s^2 , on the shaft E, and around a chain-wheel, t^2 , on a shaft, w^2 , journaled at the opposite end of the frame A.

A tightening-pulley, v^2 , is journaled in the carriage C, for holding the chain r^2 down on the chain-wheel q^2 .

Two shafts, $w^2 w^3$, are supported by boxes on the under side of the carriage C, and are provided with spur-wheels $a^3 a^4$, which mesh together and cause the shafts to rotate in opposite directions.

A pinion, b^3 , is secured to the shaft k^2 , which meshes into the spur-wheel a^4 and drives both of the shafts $w^2 w^3$.

Upon the shaft w^2 a pinion, c^3 , is placed, and upon the shaft w^3 a pinion, c^4 , is placed. Both of these pinions are provided with clutches that engage lugs formed on the bosses of the spur-wheels on their shafts, and they may be moved longitudinally on their shafts, but are prevented from turning thereon by slots in the pinions and feathers on the shafts.

The boss of each pinion is grooved circumferentially to receive a shifting-bar, the pinion c^3 having the shifting-bar d^3 , and the pinion c^4 having a shifting-bar, d^4 .

A rack, e^3 , is supported below the carriage C by the timber f^3 in position to be engaged by either of the pinions $c^3 c^4$.

Above the lathe two ways, g^3 , are supported parallel with the ways B. To the ways g^3 a bar, h^3 , is fitted and gibbed or clamped. From this bar a pendent bar, i^3 , projects, for supporting the steady-rest j^3 . This steady-rest consists of a ring, k^3 , made in two parts, $l^4 m^3$, which are hinged together at v^3 and overlap each other, and are apertured at o^3 to receive a pin for supporting the lower part m^3 . The upper part l^4 is attached to a bar, p^3 , that is received in guides q^3 on the bar i^3 , and is clamped at any desired height by the set-screw r^3 . This steady-rest is designed for encircling the log and preventing it from vibrating as it is rotated. The log to be turned is supported by the mandrel b and the tail-spindle n , and motion is imparted to the lathe by a belt applied

to the pulley s^3 . When it is desired to rotate the log, motion is imparted to the mandrel b by a belt from one of the pulleys $i j$ on the shaft k .

The log is cut away by the tools $j^1 j^1$ in the tool-holder i , one of the tools roughening the log, and the other smoothing and finishing it. The carriage c , which supports the tool-holder, is carried along by the engagement of one of the pinions $c^3 c^4$ with the rack e^3 , the said pinions receiving motion from the drive-shaft E through the chain r^2 , shaft k^2 , pinion b^3 , and spur-wheels $a^3 a^4$.

When the carriage is to be moved toward the mandrel b , the pinion c^3 is thrown into engagement with the rack e^3 . When it is desired to move the carriage in the opposite direction, the pinion c^3 is disengaged, and the pinion c^4 is thrown into engagement with the rack e^3 .

When turning light logs for small masts and spars, the steady-rest j^3 is employed to prevent the log from trembling. When the log is crooked, so that it is impracticable to turn it in the manner just described, the belt e is removed from the pulley on the mandrel b , and one of the screws g is engaged by the stop h .

Motion is imparted to the hollow mandrel G from the pulley v on the counter-shaft n^1 by the belt s , and the counter-shaft n^1 takes motion from the shaft d^2 by the belt e^2 , and the shaft d^2 is driven by the shaft k^2 .

The carriage C is moved in the same manner as in the other case, and the hollow mandrel G is moved by the screw a so as to conform to the curvature of the log as the cutters carried by the face-plate c^1 give it a true cylindrical form.

By means of my improved machine masts and spars may be rapidly turned, and the expense and labor of shaping them in the usual way avoided.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The hollow mandrel G, provided at one end with face-plate c^1 , carrying tool-holding sockets d^1 , and having both a horizontal and a longitudinal adjustment, in combination with the spindles b and m of the head and tail stocks of a mast and spar turning lathe, substantially as specified.

2. The combination, in a mast-turning lathe, of the carriage C, the tool-holder i , and the movable hollow mandrel G, substantially as herein shown and described.

3. The combination, with the shaft n^1 , of the movable boxes o^1 and a spring for drawing the shaft against the pressure of the driving-belt, substantially as herein shown and described.

4. The combination, with the movable carriage C and the driving mechanism of the hollow mandrel G, of the chain r^2 , tightener v^2 , and chain-wheel s^2 , substantially as herein shown and described.

5. The combination of the rack e^3 , pinions

c^3 c^4 , shifting-bars d^3 d^4 , spur-wheels a^3 a^4 , and drawing-pinion b^3 , substantially as and for the purpose herein shown and described.

6. The hollow mandrel G , journals v , trunnions u , bars w w^1 , standards t , adjusting-screw a^1 , and standard b^1 , all combined and arranged as and for the purpose specified.

7. An overhanging steady-rest for a mast and sparturning lathe, consisting, essentially, of the ring k^3 , made in two parts and pinned

together, bar p^3 , set-screw r^3 , and frame h^3 i^3 , in combination with the ways g^3 g^3 , which are supported above the carriage-ways and arranged parallel therewith, as and for the purpose specified.

HENRY KEAN.

Witnesses:

DAVID BURNS,
JOHN STARK.