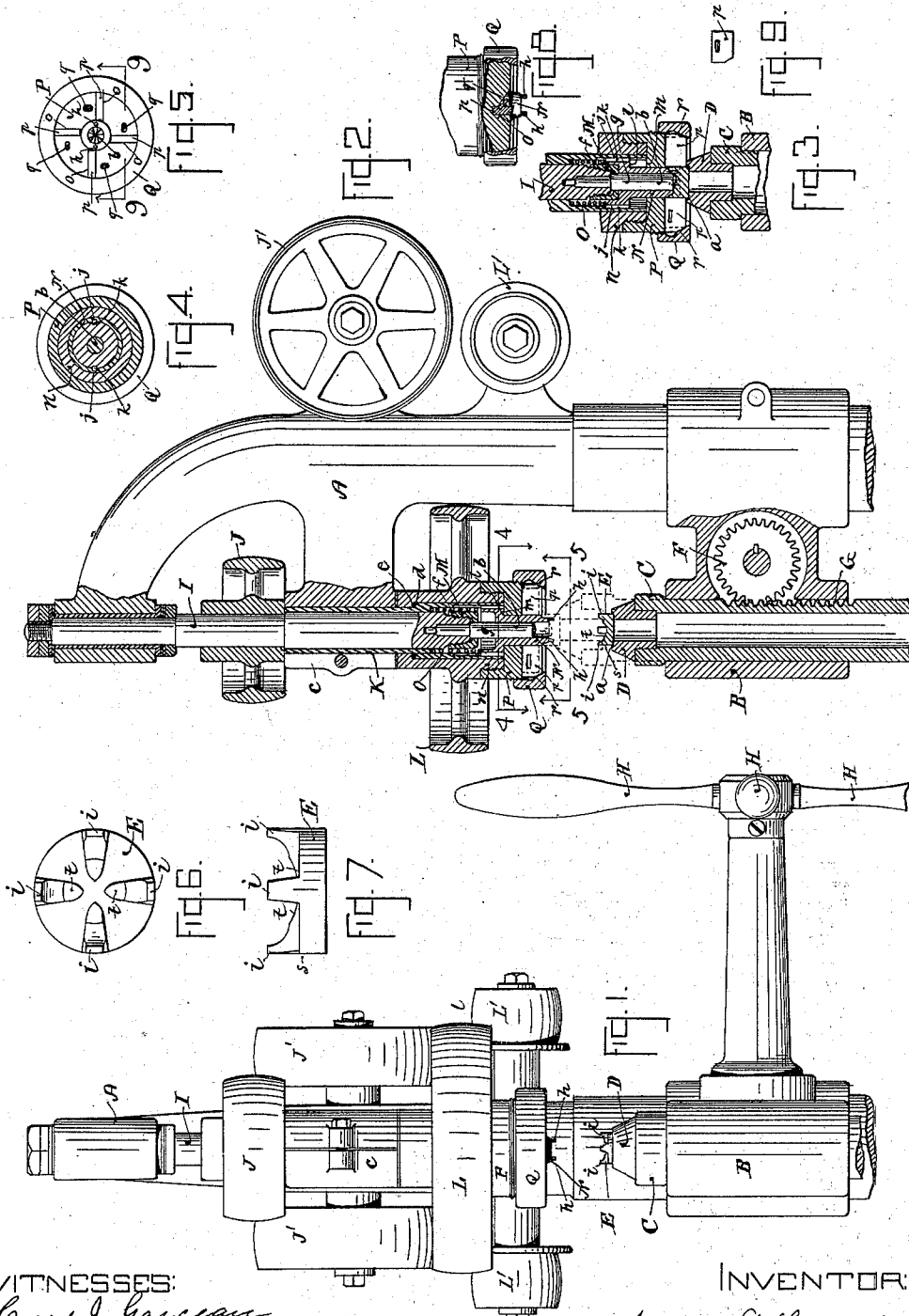


(No Model.)

A. J. LANGELIER.
MILLING MACHINE.

No. 567,952.

Patented Sept. 15, 1896.



WITNESSES:

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BY

UNITED STATES PATENT OFFICE.

ANTOINE J. LANGELIER, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO
DAVID HUNT, OF BOSTON, MASSACHUSETTS.

MILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 567,952, dated September 15, 1896.

Application filed November 18, 1895. Serial No. 569,373. (No model.)

To all whom it may concern:

Be it known that I, ANTOINE J. LANGELIER, a citizen of the United States, residing at Providence, in the State of Rhode Island, have invented a new and useful Improvement in Milling-Machines, of which the following is a specification.

My invention relates to a milling-machine adapted for special work; and it consists in improved devices for holding the article operated upon while its surface is being milled, as hereinafter fully set forth.

In the accompanying drawings, Figure 1 represents a front elevation of the parts of the machine. Fig. 2 represents a side elevation and axial section of the same. Fig. 3 represents a detail axial section showing the cutting-tools in operation. Fig. 4 represents a transverse section taken in the line 4 4 of Fig. 2. Fig. 5 represents an under view of the cutter-head. Fig. 6 represents an enlarged view, and Fig. 7 an edge view, of the illustrative piece to be milled. Fig. 8 represents a detail section taken in the line 8 8 of Fig. 5. Fig. 9 represents a side view of one of the cutters.

In the drawings, A represents the upright frame of the machine, B the adjustable head, which carries the feeding-spindle, and C the feeding-spindle, which is provided at its upper end with the holder D, which is adapted to form a rest for the piece E, which is to be operated upon by the cutters, the upper end of the said holder being provided with a slight recess *a*, which is adapted to receive and loosely embrace the cylindrical exterior of the piece E, the required up-and-down movement of the feeding-spindle C being imparted thereto by means of the gear F and rack G and the hand-arms H H.

Upon the revolving spindle I, which carries the milling-tool *b*, is secured the pulley J, and upon the hollow bearing-sleeve K, which is clamped in the split bearing-arm *c* of the frame A, is placed the loose pulley L, the said pulley being retained in position upon the bearing-sleeve by means of the shoulder *d* upon the sleeve and the corresponding shoulder *e* in the bore of the pulley.

The split lower end of the spindle I is provided with a tapering screw-thread *f*, upon which is placed the tightening-nut M, by means of which the milling-tool *b* may be firmly held in its retaining-socket in the spindle, and upon the cylindrical shank *g* of the tool *b* is placed the sliding holding-sleeve N, which is provided at its lower end with suitable spurs or projections *h h* for engaging with the upwardly-extending projections *i i* of the piece E, which is to be milled.

The bearing-sleeve K is provided internally with the longitudinal grooves *j j*, which are adapted to receive the projecting splines *k k*, secured in the opposite sides of the holding-sleeve N, so as to prevent the said sleeve from turning, and in the annular chamber above the holding-sleeve N is placed the spiral spring O, which serves to carry the said sleeve downward, the downward movement of the sleeve being limited by the engagement of the shoulder *l* with the shoulder *m* of the cutter-holder P.

The cutter-holder P is screwed onto the hub *n* of the loose pulley L, and is provided at its face with grooves *o o*, adapted to receive the cutters *p p*, the said cutters being retained in position by means of the inclined set-screws *q q* and adjusted inwardly by means of the nut Q, provided with the annular beveled surface *r*, which engages with the correspondingly-beveled outer ends of the cutters.

The pulley J is to be driven by means of a belt which passes over the idler-pulleys J' J', and the loose pulley L is to be driven in the same direction by means of a belt passing over the idler-pulleys L' L'.

In operating the machine one of the rough pieces E (shown in Figs. 6 and 7) is to be placed in the recess *a*, which loosely embraces the exterior of the said piece, and then the said piece E is to be raised with the feeding-spindle C to the position shown by the dotted lines in Fig. 2, in which position the upwardly-extending projections *i i* of the piece E will pass into engagement with the projections *h h* at the lower end of the holding-sleeve N, thus preventing the rotation of the piece E when subjected to the action of the cutters. Then

upon the continued upward movement of the feeding-spindle C the rotating cutters *p p* will operate to trim off the exterior cylindrical surface *s* of the piece E, and at the completion of the said upward movement the milling-tool *b* will operate to trim off the surfaces *t t* of the said piece E as desired.

The form of the engaging end of the yielding device for holding the article to be milled is to be made to conform to the special characteristics of the said article, and it is evident that either one or more cutters may be employed in this connection.

By my improvement a holding-chuck for the article is dispensed with, whereby the articles can be rapidly inserted into and taken from the machine, thus adapting the same for

an automatic feed; and the invention is useful in the manufacture of various special articles.

I claim as my invention—

In a milling-machine, the combination of the feeding-spindle, loosely retaining the piece to be milled, with a revolving cutting-tool, a stationary sleeve for supporting the cutting-tool, a yielding device held within the sleeve for preventing the rotation of the piece to be operated upon, and the cutting-tool held within the yielding device, substantially as described.

ANTOINE J. LANGELIER.

Witnesses:

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