(No Model.) 2 Sheets—Sheet 1.

J. D. MATTISON.

MACHINE FOR TURNING SLENDER WORK.

No. 589,905. Patented Sept. 14, 1897.

Fig. 1.

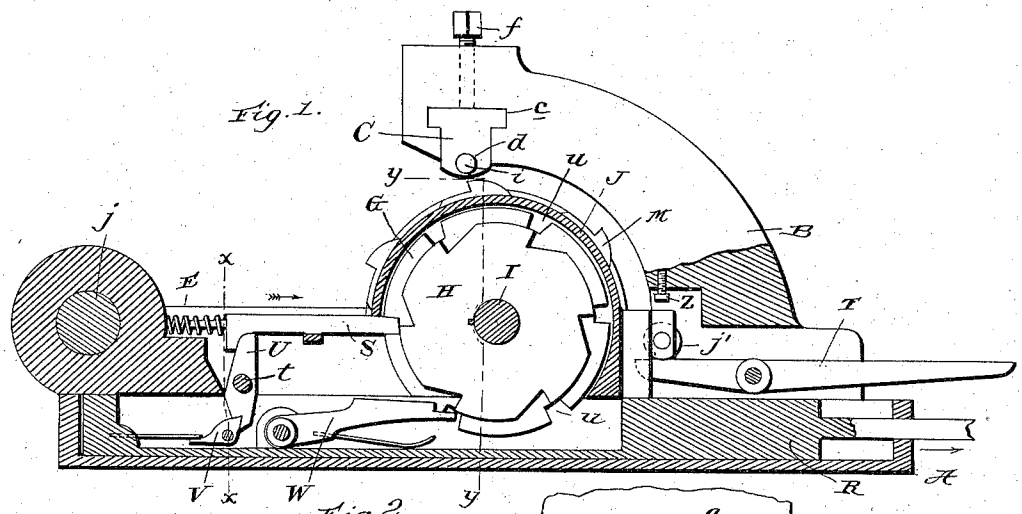


Fig. 2.

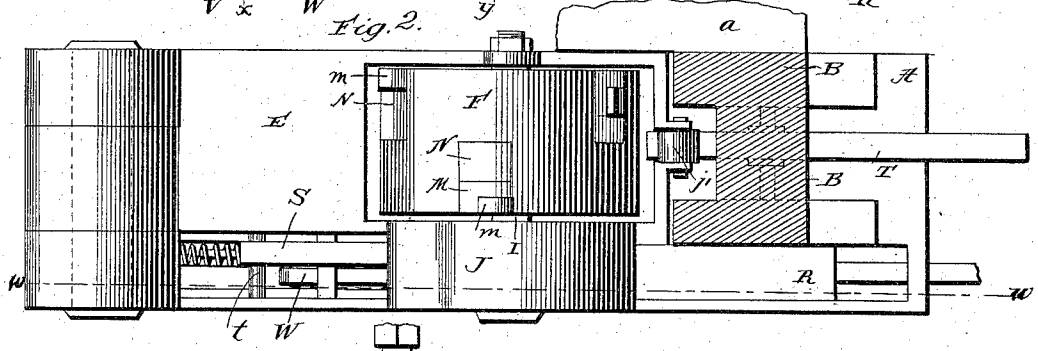
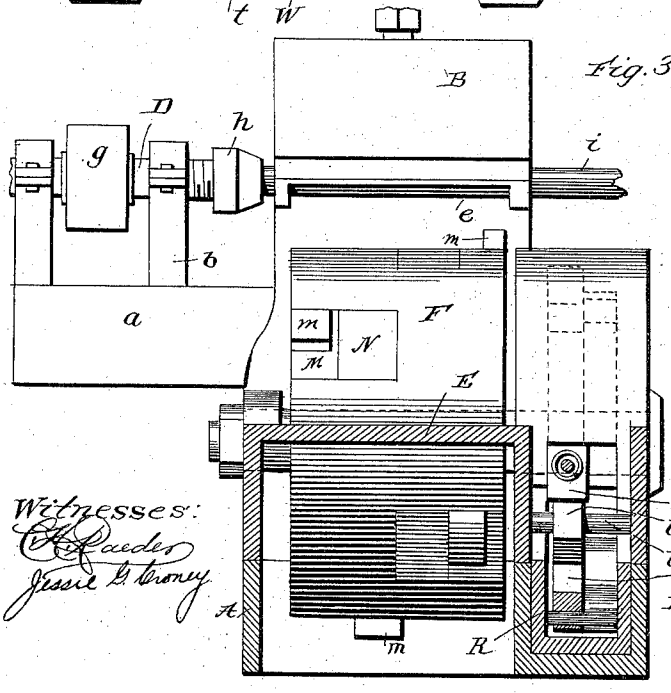


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2

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Fig. 4.

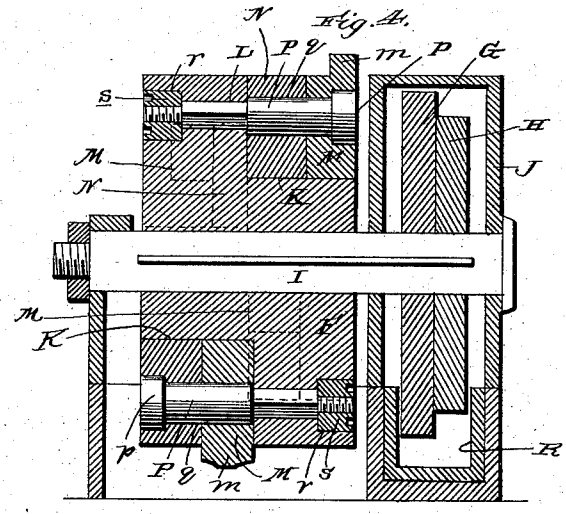


Fig. 5.

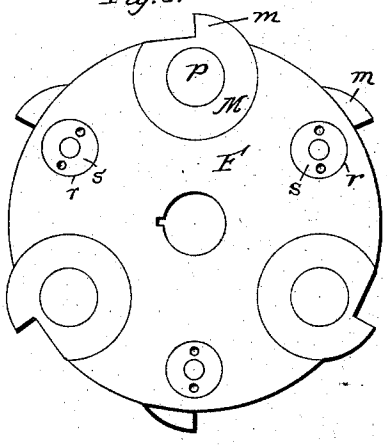


Fig. 6.

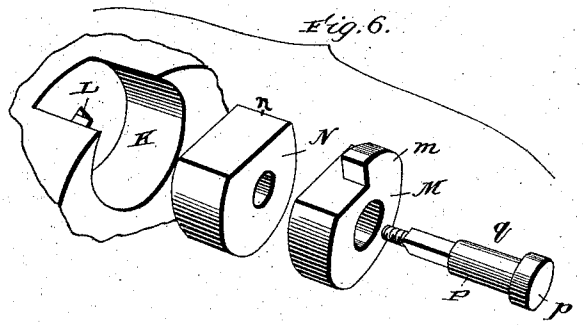


Fig. 7.

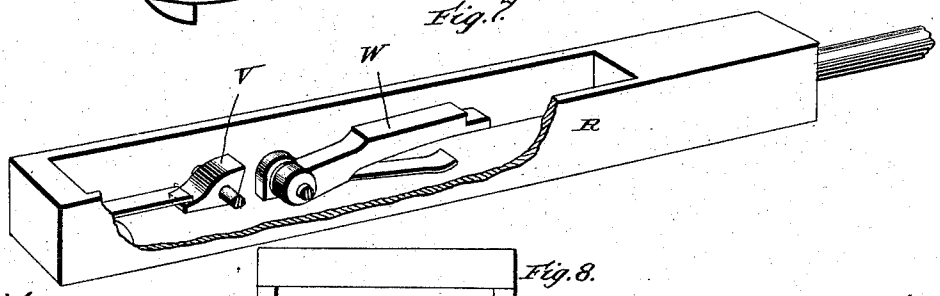
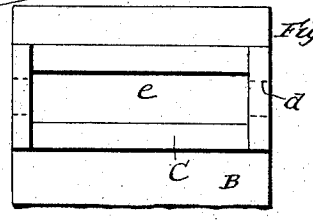


Fig. 8.



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UNITED STATES PATENT OFFICE

JAMES D. MATTISON, OF NEW YORK, N. Y.

MACHINE FOR TURNING SLENDER WORK.

SPECIFICATION forming part of Letters Patent No. 589,905, dated September 14, 1897.

Application filed May 20, 1897. Serial No. 637,426. (No model.)

To all whom it may concern:

Be it known that I, JAMES D. MATTISON, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Machines for Turning Slender Work; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in metal-turning machines; and it has for its object to provide a machine designed more especially for turning slender work and one which is adapted to so hold such work as to prevent breakage of or damage to the same when the machine is in operation.

Another object of the invention is to provide a metal-turning machine embodying such a construction that a plurality of cutters arranged in different vertical planes may be successively brought into contact with the work while the same is being rapidly rotated, so as to turn the work any length desired and, if desired, change the configuration of the same at suitable intervals in its length.

Other objects and advantages of the invention will be fully understood from the following description and claims when taken in conjunction with the annexed drawings, in which—

Figure 1 is a vertical longitudinal section taken in the plane indicated by the line *w w* of Fig. 2. Fig. 2 is a plan view with the overhanging arm in section and the chuck, chuck-shaft, and the standards, in which said shaft is journaled, omitted. Fig. 3 is a section taken in the plane indicated by the line *x x* of Fig. 1, looking in the direction of the arrow, with the lower portion of the standards broken away. Fig. 4 is an enlarged section taken in the plane indicated by the line *y y* of Fig. 1. Fig. 5 is a side elevation of the rotary cutter-head. Fig. 6 comprises perspective views of a portion of the cutter-head, a cutter, and the devices employed in securing the cutter in the head. Fig. 7 is a broken perspective view illustrating the slide-bar and its appurtenances, and Fig. 8 is an inverted plan view of the work-holding die.

In the said drawings similar letters designate corresponding parts in all of the several views, referring to which—

A indicates the bed of the machine, which preferably has a lateral extension *a*, from which rise two standards *b*, (see Figs. 2 and 3,) and B indicates an overhanging work-supporting arm, which also rises from the bed A and has a seat *c* to receive a die C, as better shown in Fig. 1. This die C is of hardened steel and has a transverse opening *d* of corresponding diameter to the work which it is designed to receive and also has one or more openings *e* in its under side, (see Fig. 8,) which are in communication with the opening *d* and are designed to enable the cutters to engage the work, as will be presently described. The die C is secured in the arm B by a set-screw *f*, and it is designed to be removed to give place to a die adapted to hold larger or smaller work, as desired.

D indicates a shaft which is journaled in the standards *b* and is provided with a pulley *g* to receive a belt from a suitable motor and a suitable chuck *h* to hold the piece of work indicated by *i*. In virtue of this it will be seen that when a piece of work is held in the chuck and the shaft D is rapidly rotated the piece of work *i* will be rapidly rotated in the die C and will be turned by the cutters presently described as the said cutters are brought into engagement with it. It will also be appreciated that all that portion of the work which is engaged by the cutters is supported by the hard-metal die and is therefore not liable to be broken or in any way damaged by the action of the cutters no matter how slender it may be.

E indicates a vertically-movable open frame which is pivotally connected with the bed A at one end, as indicated by *j*, and is preferably provided at its opposite end with an antifriction-roller *j'*, and F, G, and H indicate a cutter-head, a latch-wheel, and a ratchet-wheel, respectively. These three parts are fixed upon a common transverse shaft I, journaled in the side bars of the open frame E, so as to turn in unison, and the latch-wheel G and the ratchet-wheel H are preferably arranged beneath a head J, carried by the frame E, as shown.

The cutter-head F is provided in each of its sides with three (more or less) recesses K,

and these recesses, which extend to the periphery of the head, terminate at their inner ends in transverse bores L, which extend through to the opposite side of the head and have their outer ends arranged between the recesses in such side, as better shown in Fig. 5. Said recesses K receive the cutters M, which have projecting lips *m*, and they also receive the washers N, of various thicknesses, which are arranged in some instances at the outer side of the cutters and in some instances at inner side thereof and have a segment removed, as indicated by *n*, so that they will not project beyond the periphery of the head. The cutters M are so disposed on the head that they will traverse parallel vertical planes and not leave a bur on the work on which they are operating, and they are secured in the head, together with the washers N, by the transverse bolts P, as better shown in Fig. 4. These bolts P have heads *p*, which are countersunk in the cutters or washers, whichever are at the outer side of the head, and shanks *q*, which are circular in cross-section where they extend through the cutters and washers and angular in cross-section where they extend through the angular bores L and which have threaded ends, as shown. These threaded ends rest in circular recesses *r* at the end of the bores L, and on them are mounted nuts *s*, which rest in said recesses flush with the sides of the head and have sockets in their outer sides for the engagement of a suitable turning implement. In virtue of this construction it will be seen that any one of the cutters M may be readily removed when worn or broken and a new cutter as readily placed and secured in the head. It will also be seen that the cutters may be so disposed as to leave a bur on the work or not, as desired, and that, if desired, some of the cutters may be different in configuration from the others, (see cutter at lower portion of head in Fig. 4,) so as to turn a portion of the piece of work being operated upon into a different shape from the remainder thereof.

It is preferable to subject slender work to the action of one cutter at a time or the action of the several cutters in succession, and to this end I provide, in conjunction with the latch-wheel G and ratchet-wheel H, the slide-bar R and its appurtenances, the latch-bolt S, and the lever T. The latch-bolt S is spring-pressed and is designed to enter one of the peripheral notches *u* of latch-wheel G, so as to hold one of the cutters M below the die C and in position to enable its lip *m* to enter the opening *e* in said die and engage the work when the frame E is raised. Said latch S is engaged by a lever U, mounted on a stationary fulcrum *t*, and said lever U in turn is designed to be engaged by a spring-pressed trip V, carried by the slide-bar R, whereby it will be seen that when said bar is moved in the direction indicated by arrow in Fig. 1 the trip V will, through the medium of the lever U, withdraw the latch-bolt from engagement with the latch-wheel and will then pass the lever, so as to release the latch-bolt. The slide-bar R is also provided with a spring-pressed pawl W, which is so arranged as to come into engagement with the ratchet-wheel H after the bolt S is disengaged from latch-wheel G and before said bolt is released by the trip V passing the lever U and turn said ratchet-wheel, together with the latch-wheel and cutter-head, a sufficient distance to bring the succeeding cutter on the head below the die C and the succeeding notch in the latch-wheel to a position coincident with the latch-bolt, so as to enable said bolt when the trip V passes lever U to take into the notch and thereby hold the cutter-head against casual rotary movement. With the parts in the positions just stated the lever T, which engages the antifriction-roller of the frame E, is rocked by hand or other suitable means, so as to raise the frame E and the cutter-head and thereby carry the lip of the cutter below die C through the opening *e* in said die and into engagement with the work. The depth of the cut may be regulated by a stop-screw *f*, setting down from the arm B, impinging upon the top of frame in which the cutter-head is set or by the operator through the medium of the lever T, and when such cut is completed pressure on the outer end of the lever T is removed, permitting the parts to return to the position shown in Fig. 1. The slide-bar R may be and preferably is returned to the position shown in Fig. 1 while the frame E is raised, and after the cut just described is completed and the frame E is lowered said bar is moved in the direction indicated by arrow to turn the cutter-head and bring the succeeding cutter below the die C, after which the operation before described is repeated. The movements of the slide-bar R may be effected by hand or by other suitable means, and through the medium of the same all of the cutters on the head F may, if desired, be brought in succession into contact with the work.

My improved machine is designed more especially for turning slender work, but it is obvious that it may be employed to advantage in turning stout work when desired. I would also have it understood that when desirable the disposition of the cutters on the cutter-head may be such as to permit of the die C being provided with two or more openings *e* instead of one, the plurality of openings being preferable, as a better support for the work is thereby provided, and also that this machine may be made vertical or horizontal or at any angle which may be thought preferable for adaptation to any purpose.

Having thus described my invention, what I claim is—

1. In a metal-turning machine, the combination of a bed or main frame, a frame pivotally connected with said bed or frame at one end so as to permit of its being swung, a

cutter-head arranged in and movable with said frame, one or more cutters carried by said head, a work-support and a hard-metal die arranged in said support and having a transverse opening for the reception of work and also having one or more openings in its side contiguous to the cutter-head to enable the cutter to engage the work, substantially as specified.

2. In a metal-turning machine, the combination of a bed or main frame, a frame pivotally connected with said bed or frame at one end so as to permit of its being swung, a rotary cutter-head arranged in and movable with said frame, and having a plurality of cutters on its periphery, a work-support, a hard-metal die arranged in said support and having a transverse opening for the reception of work and also having one or more openings in its side contiguous to cutter-head to enable the cutters to engage the work, a latch-wheel fixed with respect to the cutter-head, a ratchet-wheel also fixed with respect to said cutter-head, a spring-pressed bolt engaging the latch-wheel, a slide-bar, mechanism intermediate of said bar and the bolt for disengaging the same from the latch-wheel, and a spring-pressed pawl carried by the slidable bar and adapted to engage and rotate the ratchet-wheel and consequently the cutter-head when the bolt is disengaged from the latch-wheel, substantially as specified.

3. In a metal-turning machine, the combination of a bed, a movable frame connected therewith, a rotary cutter-head arranged in said frame and having a plurality of cutters, a latch for holding said head against casual rotation, a slide-bar, mechanism intermediate of the slide-bar and the latch for disengaging said latch from the cutter-head, and mechanism intermediate of said slide-bar and the cutter-head for partially rotating said head when it is released, substantially as specified.

4. In a metal-turning machine, the combination of a bed, a movable frame connected therewith, a rotary cutter-head arranged in said frame and having a plurality of cutters, a latch for holding said head against casual rotation, a ratchet-wheel fixed with respect to the cutter-head, a slide-bar, mechanism intermediate of the slide-bar and the latch for disengaging said latch from the cutter-head, and a spring-pressed pawl carried by the slide-bar and adapted to engage the ratchet-wheel, substantially as specified.

5. In a metal-turning machine, the combination of a bed, a frame pivotally connected with said bed, a rotary cutter-head arranged in said frame and having a plurality of cutters on its periphery, a latch-wheel fixed with respect to the cutter-head, a ratchet-wheel also fixed with respect to said cutter-head, a spring-pressed bolt engaging the latch-wheel, a lever engaging said bolt, a slide-bar, a spring-pressed trip carried by said slide-bar and adapted to engage the said lever and a spring-pressed pawl also carried by the slide-bar and adapted to engage the ratchet-wheel, substantially as specified.

6. The combination of a cutter-head having a recess in one of its sides extending to its periphery and a transverse bore of angular form in cross-section extending from the inner end of the recess and terminating at its opposite end in a circular recess formed in the opposite side of the cutter-head, the apertured cutter arranged in the recess of the head and having the lip projecting beyond the periphery of said head, the apertured washer also arranged in said recess, the transverse bolt extending through the cutter, the washer and the transverse bore of the cutter-head and having the threaded end and the circular nut arranged on said threaded end and within the recess in the side of the head opposite to that in which the cutter and washer are arranged substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES D. MATTISON.

Witnesses:
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