

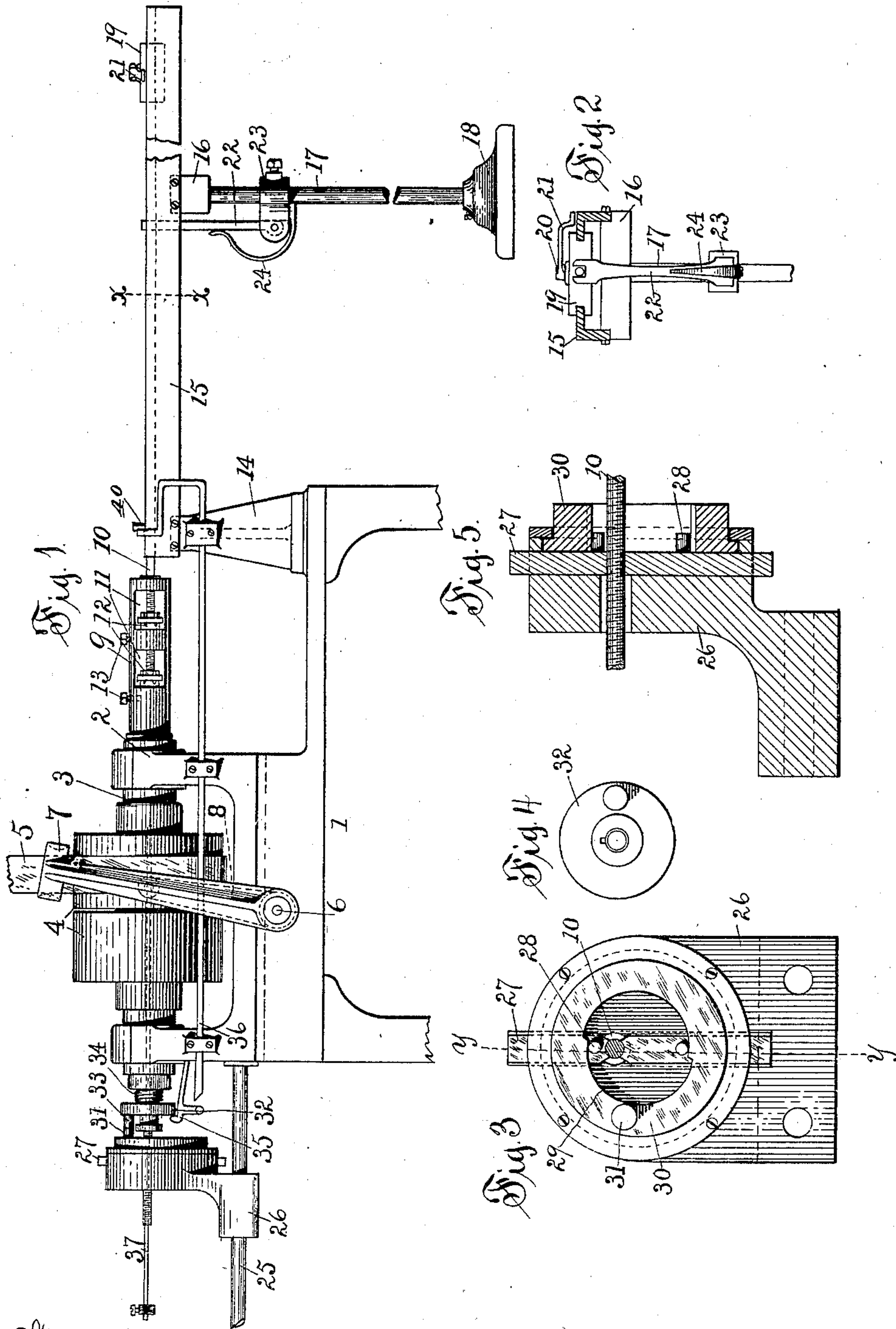
No. 725,292.

PATENTED APR. 14, 1903.

A. M. STILLMAN.
METAL WORKING MACHINE.
APPLICATION FILED JUNE 25, 1901.

NO MODEL.

2 SHEETS—SHEET 1.



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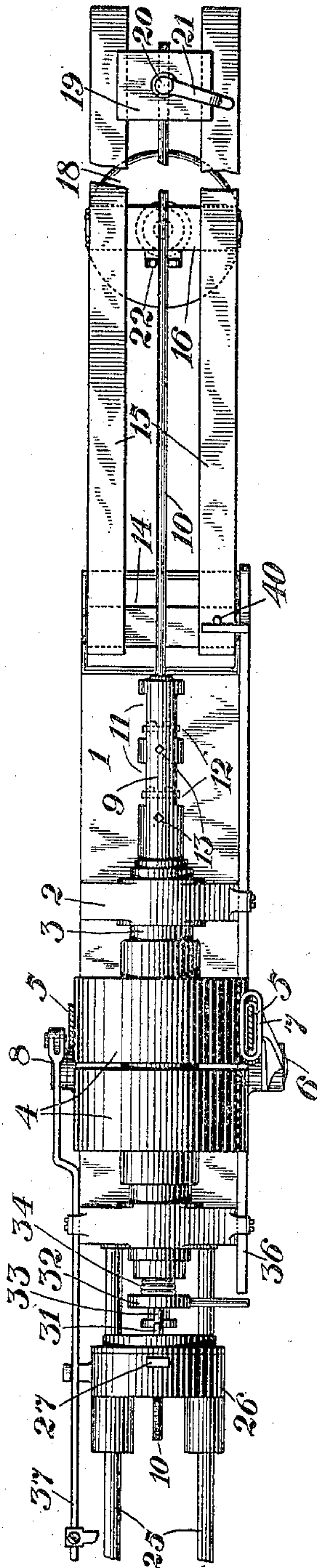
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2 SHEETS—SHEET 2.

Fig. 6.



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AUGUSTUS M. STILLMAN, OF HARTFORD, CONNECTICUT.

METAL-WORKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 725,292, dated April 14, 1903.

Application filed June 25, 1901. Serial No. 65,956. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS M. STILLMAN, a citizen of the United States, and a resident of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Metal-Working Machines, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

My invention relates to that class of metal-working machines employed for performing various operations upon comparatively small pieces of work and which are commonly known as "screw-machines," although not employed solely for the purpose of making screws, such machines being capable of producing a great number of different articles; and the object of my invention is to produce a machine of this class in which a wire may be quickly threaded from end to end or one in which screws having a thread from end to end may be quickly and easily produced; and a further object is to provide a machine of this class in which the operations required for producing such a screw or screw-threaded rod shall be comparatively few. A machine in which these objects may be carried out is illustrated in the accompanying drawings, in which—

Figure 1 is a view in front elevation of a portion of a machine embodying my invention. Fig. 2 is a detail end view in section through the guideways on line *xx* of Fig. 1. Fig. 3 is a detail view, in vertical cross-section, on enlarged scale, through the machine just at the right of the rear clamp as seen in Fig. 1. Fig. 4 is a detail face view, on enlarged scale, of the locking-plate for the rear clamp. Fig. 5 is a detail view in section on line *yy* of Fig. 3. Fig. 6 is a plan view of the machine.

In the accompanying drawings the numeral 1 indicates a portion of the frame of the machine, on which are mounted bearings 2 for a spindle 3, supporting pulleys 4, by means of which the spindle is operated. These pulleys 4, mounted on the spindle, consist of fast and loose pulleys common to this class of machines and which are operated as by means of a belt 5, extending from any suitable driving means, as a counter-shaft or like part. A rock-shaft 6 is supported in the

frame, to which is secured at one end a belt-shifter 7 and at the opposite end a stop-motion arm 8. (Shown in dotted outline in Fig. 1.)

The spindle 3 has secured to its front end a die-holder 9, which is preferably constructed to hold a plural number of dies adapted to operate upon a rod 10 of metal. In the form of device shown herein recesses 11 are formed in the die-holder in which the dies 12 are located and held in an axial opening, as by means of set-screws 13, the construction of the die-holder and the means of holding a die therein as to a single die only being an old and well-known one.

Guideway-supports 14 are mounted on the frame of the machine, preferably on each side, and on these supports one end of the guideways 15 is held. These guideways, as shown in Fig. 2, consist of angle-irons of L shape, and the opposite ends of these guideways are supported on a cross-piece 16, mounted on a post 17, that is adjustably held in a base 18.

A guide 19 is supported on the guideways 15, and this guide has an opening in which the rod 10 is adapted to be located and secured, as by rod-clamp 20. This rod-clamp, as shown in the drawings, preferably consists of a screw extending through the guide to the recess in position to engage the rod, and from this screw a clamp-arm 21 extends. The screw is preferably of comparatively quick pitch, so that a slight turning movement will cause the screw to release its hold upon the rod.

An intermediate support-rod 22 is pivoted to a bracket 23, secured to the post 17, a spring 24 holding this support normally in an upright position. This construction enables the support 22 to yield when the guide 19 comes in contact with it, the latter passing over the support, after which it returns to its normal position under the influence of spring 24, whereupon it supports the overhanging end of the work, so that a very long wire may be conveniently drawn through the threading-dies.

Slideways 25 are secured to and project from the end of the frame, and on these slideways a clamp-slide 26 is supported, so that it may slide freely thereon. Clamp-jaws 27 are mounted radially in the clamp-slide, which

has an opening so formed as to receive a rod and locate it between the clamp-jaws. Each clamp-jaw is provided with suitable means for causing them to be closed or opened, in the form shown a pin 28 on each jaw being located in position to be acted upon by the cam-surface 29 on the actuator 30. This actuator is mounted on the clamp-slide, so that it may be easily rotated, the cam-surfaces 29 being so formed that this rotation will cause the clamp-jaws 27 to be closed upon a rod of stock. A pin 31 is secured to the face of the actuator and serves as a part of the means for rotating the actuator.

A locking-disk 32 is secured to the spindle 3, and this locking-disk bears a pin 33, adapted to engage the pin 31 to rotate the actuator. The pins 31 and 33 are eccentrically mounted with respect to each other, so that when the pin 31 is in the uppermost position, as shown in Fig. 1, it will be engaged by the pin 33; but when the pin 31 has been rotated to the position shown in Fig. 3 the pin 33 will pass by and be disengaged from the pin 31.

The locking-disk 32 is splined to the spindle 3, and a spring 34 tends to hold the disk at the outer limit of its play.

A latch 35 is secured to the frame of the machine in position to engage the plate 32 to hold it at its innermost position, and a trip 36 is located in position to engage the latch to release it from the disk 32. In the form shown this trip consists of a sliding bar mounted on the supports 2, the opposite end of the trip being so formed as to be located in the path of movement of the guide 19 and be operated thereby. In the form of device shown this trip 36 has a beveled end adapted to engage a projection from the latch 35, so that as the trip is moved endwise the latch is forced downward.

A stop-rod 37, suitably supported, is connected with the stop-motion arm 8 and has on its opposite end, adjustably secured thereto, a block lying in the path of movement of the clamp-slide 26. This construction enables the machine to be stopped at any predetermined position that may be reached by the clamp-slide.

The operation of the device is as follows: The spindle 3 being rotated, as by the belt 5, the die-holder is caused to rotate. The rod of stock 10 is secured near one end in the follower or guide 19 and the opposite end of the rod engaged with the advance die in the die-holder 9. The rod-support 22 sustains the rod between the ends and prevents any distortion of the rod. The operation of the die causes the rod to be moved lengthwise, carrying with it the guide 19, which as it comes in contact with the support 22 causes the latter to be swung on its pivot against the force of the spring 24, which after the guide has passed from engagement with the support causes it to be returned to its normal position. The guide 19 continues to move until it en-

counters the end of the trip 36, sliding it into engagement with the projection from the latch 35, which is thereby disengaged from the locking-disk 32. During the operation just described and after the guide 19 has encountered the trip 36 the clamp-arm 21 has hit a stop 40, secured in the path of movement of the arm, which is rotated, so as to release the hold of the rod-clamp on the rod. The disengagement of the latch 35 from the locking-disk 32, above described, allows the latter to be thrust toward the clamp-slide 26, the pin 33 coming in contact with the pin 31 and rotating the actuator 30, thus causing the clamp-jaws to approach each other and grasp the rod of stock. This grasp of the clamp-jaws on the rod is effected at the time of disengagement of the rod-clamp 20 or about this time. Just before the end of the rod passes the last die in the die-holder the clamp-slide 26 encounters the block on the stop-rod 37, moving the stop-motion arm 8, rocking the shaft 6, and swinging the belt-shifter to stop the machine, which operation is effected at the same time as or just before the final disengagement of the rod from the threading-dies. Thus it will be seen that the several automatically-operating devices or mechanisms are called into action by or through the movement of the work itself as it is fed along by means of the dies and that some of the automatic movements are effected directly or indirectly by the follower 19, which is secured to the work in advance of the dies and which also preferably serves as a guide for the work.

For some kinds of work I preferably employ two dies, as illustrated. Variations may be resorted to within the scope of my invention, and portions of my improvement may be used without others.

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

1. In a rod-threading machine, in combination, a threading-die; means for operating said die; a slide mounted in advance of the die; a work-clamp provided upon said slide; means rendered effective by the movement of said slide for releasing the work from said clamp; a slide mounted in the rear of the die; a work-engaging clamp upon said rear slide; and means for causing the last-mentioned clamp to engage the work.

2. In a rod-threading machine, in combination, a threading-die; means for operating said die; a slide mounted in advance of the die; a work-clamp provided upon said slide; means rendered effective by the movement of said slide for releasing the work from said clamp; a slide mounted in the rear of the die; a work-engaging clamp upon said rear slide; and means having an operative connection with said rear slide, for causing the last-mentioned clamp to engage the work.

3. In a metal-working machine, in combination, a threading-die, means for operating said die, a slide located in rear of the die and having devices for engaging the work, and

means connectible to the work in advance of the die and movable by the work, for causing said devices to engage the work during the movement of such work.

4. In a metal-working machine, in combination, a threading-die, means for operating said die, a slide arranged to engage the work in rear of the die, and a stop-motion device arranged to be operated by said slide.

5. In a metal-working machine, in combination, a die, means for operating the die, a slide mounted in advance of the die, means on said slide for grasping a piece of work, a slide mounted in rear of the die, means on said slide for grasping a piece of work, and connections between the two slides for operating the grasping means on one from the movement of the other.

6. In a metal-working machine, in combination, a die; means for operating the die; a slide connectible to the work in advance of the die; and a support for the work located between the die and the slide and in the path of said slide, and mounted so that it may be moved out of the way by said slide.

7. In a metal-working machine, in combination, a die; means for operating the die; a slide adapted to support a piece of work in advance of the die; and a swinging support for the work between the die and the slide; said slide being movable past said swinging support, so as to carry the work close up to said die.

8. In a metal-working machine, the combination with a die, of shiftable means adapted to support the work at one side of said die, and a swinging work-support located in position to be thrown out of operation by the supporting means on the movement thereof.

9. In a metal-working machine, the combination with a die, of shiftable means adapted to support the work at one side of said die, a movable work-support located in position to be thrown out of operation by the shiftable means on the movement thereof, and means effective to automatically return said support into position after the passage of said shiftable means to support the work at the opposite side thereof.

10. In a metal-working machine, the combination of a threading and feeding die; means located in position to grasp the work; and means operable by the work during the feeding movement thereof, for effecting the engagement of the work by said grasping means.

11. In a metal-working machine, the combination of a threading and feeding die; means located in position to grasp the work at one part thereof; means operable by the work for effecting the engagement of the work by said grasping means; means for grasping the work at another part thereof; and means also operable by the work during its feeding movement for effecting the release of the work by said last work-grasping means.

12. In a metal-working machine, the combination of a threading and feeding die; a die-

holder; means for supporting the work at one side of said holder; means for supporting the work on the other side of said holder; and means operable by the work for causing one of said supporting means to engage the work and the other of said supporting means to release the work.

13. In a metal-working machine, the combination of a die; means located in advance of the die for clamping the work; means located in the rear of the die for clamping said work; and a connection between the two clamping means for operating one of said means during the movement of the other.

14. In a metal-working machine, the combination of a die; means for grasping the work in advance of said die; means for grasping the work in rear of said die; and adjustable means between the advance and rear grasping means for operating the latter at a predetermined point in the movement of the work, for causing said rear grasping means to grasp the work.

15. In a metal-working machine, the combination of a threading and feeding die; means for grasping the work in advance of said die; means for grasping the work in rear of said die; means for effecting a relative rotation between said die and said work-grasping means; one of said die and work-grasping elements being capable of movement in a direction parallel to the axis of the threading-die; means rendered effective by the movement of said moving part for causing said advance grasping means to release the work; and means also rendered effective by the movement of said moving part for causing said rear grasping means to grasp the work.

16. In a metal-working machine, the combination with a die, of means for clamping the work at one side of said die and automatically operative at a predetermined period to grasp the work, a device effective to control the operation of said clamping means, and means automatically shiftable into position by the work to engage and operate said device and thereby effect the engagement of the work by said clamping means.

17. In a metal-working machine, the combination with a die, of means for clamping and supporting the work at the rear of said die, work clamping and supporting means in advance of the said die; and means for enabling the advance clamping and supporting means to cause the rear clamping and supporting means to clamp the work, and means for causing the advance clamping and supporting means to release the work.

18. A rod-threading machine, comprising a die-holder, a die carried thereby, work-holding means in rear of said die, said work-holding means including a grasping device, means for holding the work in advance of the die, means for automatically releasing the work from said advance holder at a predetermined point, and automatically-operating means for causing said work-grasping device

to grasp the work substantially at the time when it is released by said means for holding the work in front of the die.

19. In a metal-working machine, the combination with a die, of means shiftable by the work for supporting the work in advance of said die, and including releasable work-clamping means; means for clamping the work in the rear of the die; means operable
10 through the movement of the work for con-

trolling the clamping operation of said last clamping means; and means operable by the rear work-holder for stopping the machine; the rear clamping means being constructed to be moved with the work in order that it
15 may be operative to stop the machine.

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