

1,006,277.

2 SHEETS—SHEET 1.



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 RULE CUTTING MACHINE.
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2 SHEETS-SHEET 2.

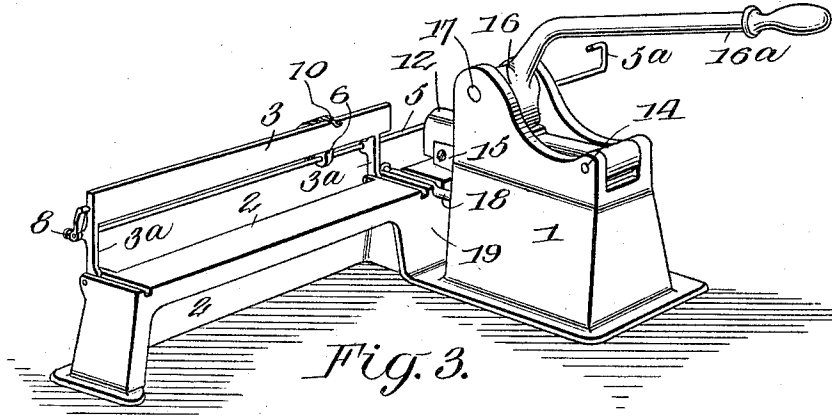


Fig. 4.

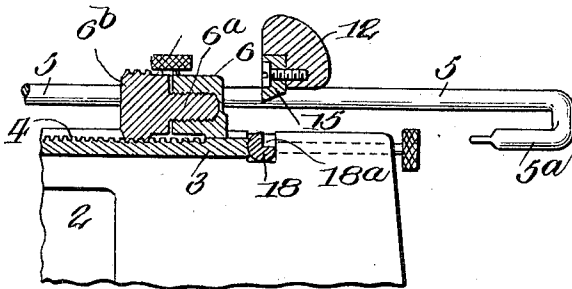


Fig. 5.

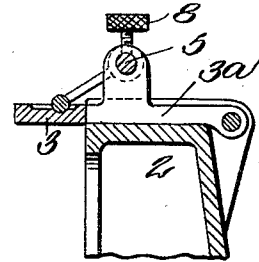


Fig. 8.

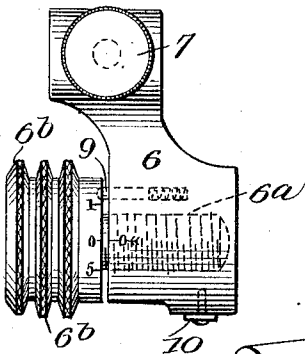
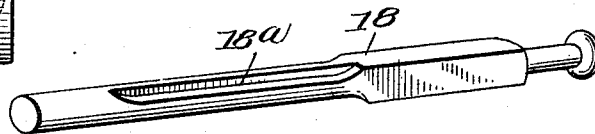
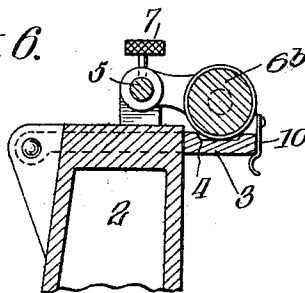


Fig. 6.



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UNITED STATES PATENT OFFICE.

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RULE-CUTTING MACHINE.

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To all whom it may concern:

Be it known that I, JOHN A. RICHARDS, a citizen of the United States, and a resident of Albion, in the county of Calhoun and State of Michigan, have invented an Improved Rule-Cutting Machine, of which the following is a specification.

I have devised and put in successful practical use an improved machine for cutting into various lengths the steel rules or other metal strips such as used by printers, lithographers, box-makers, novelty manufacturers, and the like.

A special and improved feature of the machine is its adaptation for cutting bent rules as well as straight ones. When a bent rule is to be cut, the shelf or gage-bar, which serves as a support for straight rules while being cut, is raised and swung back out of the way, which allows due access to the cutting mechanism so that the bent rule may be manipulated in the required manner. In order to provide for cutting bent or curved rules or strips of very small diameter, the bar provided with a knife-edge with which the cutter proper coacts, is adapted for detachment so as to allow substitution of another bar of different diameter.

The invention also includes a micrometer gage attachment and a slidable rod gage adapted for supporting one or both ends of a rule while being cut.

The invention further includes other features as will be hereinafter set forth.

In the accompanying drawings Figure 1 is a top or plan view of the machine. Fig. 2 is a vertical cross section of the same on line 2—2 of Fig. 1. Fig. 3 is a perspective view, the shelf or gage-bar for supporting straight rules being raised and thrown back out of the way as required when cutting bent rules. Fig. 4 is a longitudinal section on the line 4—4 of Fig. 1. Fig. 5 is a vertical cross section on the line 5—5 of Fig. 1. Fig. 6 is a vertical cross section on the line 6—6 of Fig. 1. Fig. 7 is a perspective view of the interchangeable knife-edge bar. Fig. 8 is a plan view of the gage-block and its screw attachment.

As indicated in Figs. 1 and 3, the cast iron frame or bed of the machine is right-angular in plan, the short head 1 serving for support and pivotal attachment of the rule-cutter, and the cam for operating it, while the longer flat-topped portion 2 serves for attachment and support of a swinging

gage-bar, or shelf, 3, upon which straight rules are laid to be cut.

As shown in Figs. 1 and 3, the gage bar is provided with arms 3^a which are pivoted near the ends and on the rear side of the frame portion 2 and when the gage bar is in the horizontal or working position indicated in Fig. 1, the said arms lie in grooves in the part 2. The upper side or surface of the gage bar 3 is provided with a series of transverse notches 4, as shown in Fig. 1, and the surface is also graduated for the purpose of readily determining the length to which a rule is to be cut.

A gage rod 5 is held slidably in lugs formed on the upper side of the arms 3^a, and to this rod, intermediate of the said arms, is applied a rule gage 6 which is slidable on the rod to and from the cutting mechanism and may be clamped in any adjustment by means of a screw 7. A clamp screw 8 is also applied to one of the lugs of the arms 3^a, as shown in Fig. 5, for the purpose of clamping the gage rod 5 in any required adjustment. The ends of this rod are bent or curved reversely, as indicated at 5^a and 5^b in Fig. 1.

The notches or transverse grooves 4 in the rule shelf or gage bar 3 do not afford so fine an adjustment of the sliding gage 6 as is often desirable, and, therefore, I provide the gage with a micrometer adjustment.

A screw 6^a—see Figs. 1 and 4—having an enlarged head 6^b provided with a series of circumferential ribs, or teeth with milled edges, is arranged horizontally in the gage block 6. The ribs or teeth of the screw head work in the transverse grooves 4 of shelf 3, and their milled edges afford a friction hold, so that the screw may be easily rotated to adjust the block 6 toward or from the cutter. The smooth part of the head 6^b of the screw which is next to the gage block proper, is marked or graduated, thus: 1—2—3—4—5—0. A spring catch 10—see Figs. 1, 3 and 6—is attached to the free edge of gage-block 6, and engages the edge of the shelf 3, so as to lock the gage block detachably and hold it firmly in place when in use. A spring-actuated pin 9 serving as a detent—see Figs. 1 and 8—is applied for holding the nut in any adjustment, it being understood that this device permits manual adjustment of the nut, but locks against accidental rotation.

For convenience of description of the op-

eration of the apparatus, the graduated bar or shelf 3 may be termed the main gage, and the ends 5^a and 5^b of the rod 5 may be termed the front and rear extension gages, respectively. If, now, a printer wishes to cut a short piece, say $\frac{1}{2}$ pica, off a short rule having a length, say, of 21 picas, he would use the main gage and the micrometer or gage block, the latter being set at 0, one turn from its regular position, since one turn would be the equivalent of a half pica, or six points printer's measure. In other words, the main gage or micrometer would be used when only a short piece is to be cut off an already short rule. But, if it were required to cut this same $20\frac{1}{2}$ pica piece off of a length of rule which is 180 picas long, it will be more convenient to use for this purpose the extension gage 5^a; and in setting it for this measurement, the end 5^a would be moved back against the knife edge 18^a and the micrometer or gage block would be set back to the extreme or farthest shelf hinge, it being thus placed at 0. Now, having tightened the screw 7 to clamp the block on the gage rod 5, the micrometer wheel 6^b is turned one revolution, that is to say, the equivalent of $\frac{1}{2}$ pica or six points, which will move the end 5^a of the rod 5, $\frac{1}{2}$ pica forward from the knife; then raise the micrometer or gage block (the screw 7 being still tight) and move it forward 20 picas on the shelf graduations and a measure of $20\frac{1}{2}$ picas will be indicated in front of the knife, this being secured by the use of the micrometer or gage block on the main gage shelf, and no attention need be paid to whatever measure or distance is between the knife and the gage block. Now, having secured the desired measure in front of the knife, the screw 8 is tightened and the screw 7 loosened, and the micrometer or gage block thrown back out of the way, so that the long length of the rule (180 picas) may be extended on the main shelf.

The use of the rule extension gage 5^b will be apparent from the following: Suppose the printer wishes to cut a piece of rule $110\frac{1}{2}$ picas long, which is longer than the main shelf will accommodate between the gage block and the knife; but, by having the rear extension gage 5^b adjusted at 84 on the main gage and having the micrometer or gage block set back near the knife end of the machine, with the screw 7 tight and the screw 8 loose, the micrometer or gage block may be set to the desired point; in this instance the equivalent of one revolution or $\frac{1}{2}$ pica; then move the block with the screw 7 still tight, back 25 picas, which will give the desired length of $110\frac{1}{2}$ picas, or 85 plus $25\frac{1}{2}$. Now, tighten the screw 8 and loosen the screw 7 and throw the block back out of the way, and the rule can be laid on the main gage or shelf 3 and cut $110\frac{1}{2}$ picas. The

foregoing explanation shows that the micrometer or gage block has a triple application in this machine, since it will give a micrometer adjustment on the main gage or shelf, also on the front extension, and on the rear extension, which is a feature of much importance, since it adapts the machine for a variety of measurements or lengths of rules.

The cutting mechanism is constructed and operates as follows. As shown in Fig. 2, a lever 12 is arranged transversely and practically horizontally in the head 1 and is provided with a pendent arm 12^a against which a spring 13 is arranged to press. This right angular part is pivoted at 14 in the head and is provided at its free end with a cutter consisting of a blade 15 whose edge is inclined and beveled in the required manner. A cam 16 is adapted to act on a shouldered portion of the knife lever 12, the same being pivoted at 17 in the head 1 and provided with a handle 16^a by which it may be conveniently and powerfully operated. The knife proper 15 coacts with a knife-edge bar 18—see Figs. 2, 4, and 7—the same being squared at one end and circular at the other and provided intermediately with a groove or rabbet 18^a, against the vertical side of which the knife 15 acts in cutting. The longer flat-topped portion 2 of the frame is provided with transverse grooves, as will be seen by inspection of Figs. 1, 2, and 4, that serve to receive and hold securely the knife-edge bar 18. In other words, the squared portion or end of the bar 18 wedges tightly in the corresponding groove of part 2, so that the grooved portion 18^a of the same extends across the vertical space or opening 19 that exists between the head 1 and the side 2. When it is desired to cut a bent rule, which of necessity cannot be laid flat on the shelf 3, the latter is raised and thrown back out of the way or into the position indicated in Fig. 3, which leaves the space 19 between the head 1 and side frame 2 easily accessible. Thus, the portion of the bent rule which is to be severed may be placed over the knife-edge bar 18 and the body of the rule may hang or lie in the space 19 or extend beyond it. Then the cutting mechanism is operated as before indicated. This provision of a space between the parts 1 and 2 and the bridging of the same by the knife-edge bar 18 is, therefore, a very important feature of the machine, whereby it is adapted for cutting bent or curved as well as straight rules.

A further important feature is the detachability of the knife-edge bar 18 which permits it to be replaced by another when required, as for instance in case a bent rule has a circle of very small diameter, so that the knife-edge bar held in the machine is too large. Thus, a knife-edge bar of less

diameter in its circular portion may be substituted without difficulty.

I thus provide a machine essentially simple in construction and operation which is adapted for cutting rules and metal strips of various kinds for various purposes, and is equally adapted for straight rules and bent or curved ones by the simple expedient of adjusting the straight rule shelf in one position or another.

While the machine is primarily intended for the uses hereinbefore specified, I desire it understood that in larger size it may be very successfully employed for cutting large bars or thick metal strips for various uses.

What I claim is:—

1. The improved rule-cutter, comprising a rectangular frame formed of two portions separated vertically by a considerable space, a knife-edge bar bridging such space, a cutter proper arranged to coact therewith, and a shelf or gage bar hinged to one of the portions of the frame and extending in a direction at right angles to the knife-edge bar and adapted to be swung vertically to bring it into or out of working position, substantially as described.

2. In a rule-cutting machine, the combination with a frame and cutting mechanism proper arranged thereon, of a rule support-

ing shelf having transverse notches in its surface, a gage block, and a support therefor on which it is adapted to slide along said gage-bar and having teeth adapted to engage the grooves of the latter, substantially as described.

3. In a rule cutter, the combination with a rectangular frame, a cutter proper pivoted in one portion of the same, a rule-supporting bar attached to the other portion at right angles to the cutting mechanism, a slidable rod held adjustably and having the ends which project beyond the cutting mechanism curved reversely, whereby it is adapted for supporting the ends of a rule which is to be divided, substantially as described.

4. In a rule cutting machine, a support for the rule while being cut, a knife and means for forcing it downward for effecting the cutting operation, and a knife-edge bar held detachably in the frame, the latter being provided with a groove adapted to receive a portion of the said bar which is wedged therein, so as to be held securely while in use, as shown and described.

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Witnesses:

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