

April 30, 1935.

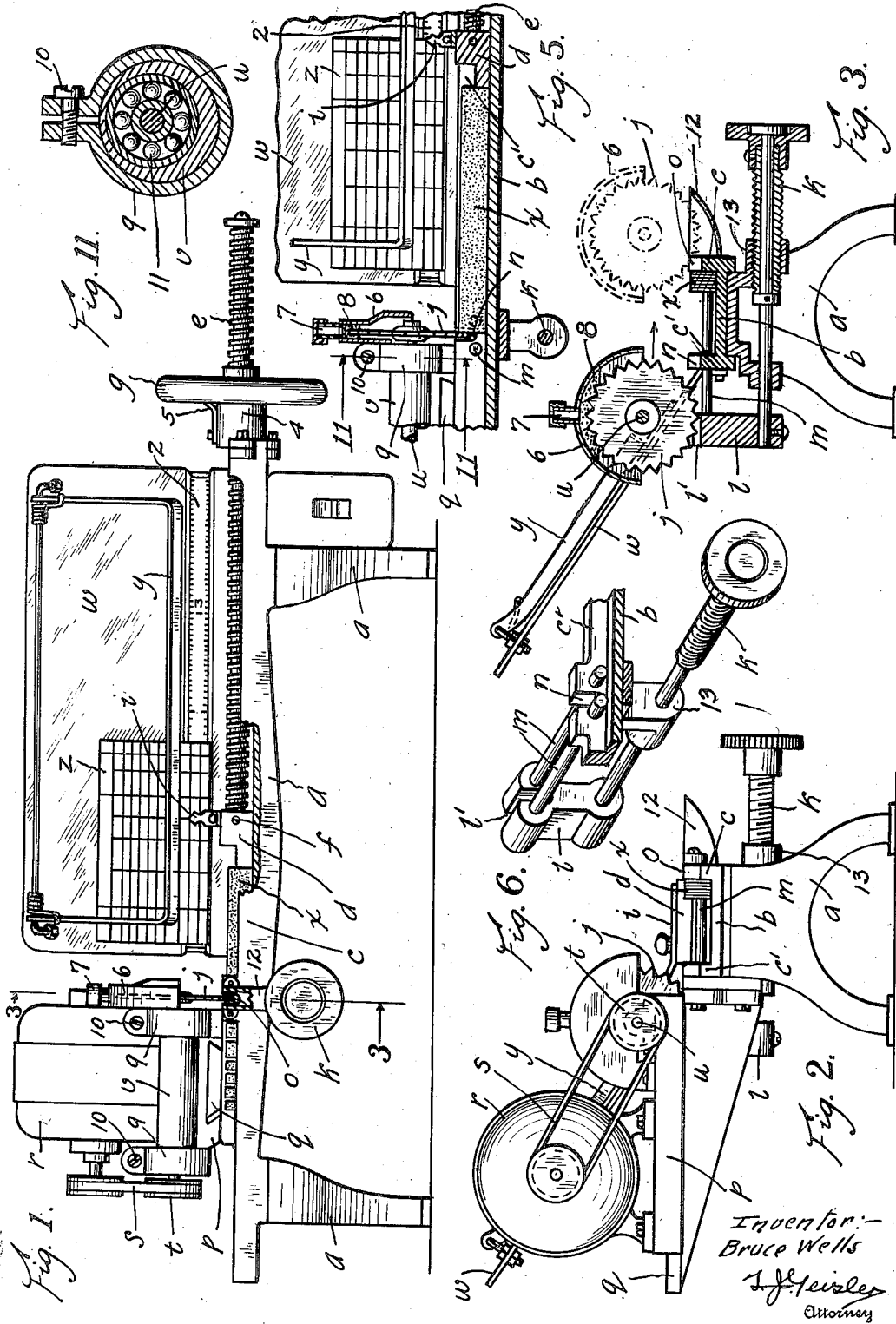
B. WELLS

1,999,381

CROSS RULE SLITTING MACHINE

Filed July 3, 1933

2 Sheets-Sheet 1



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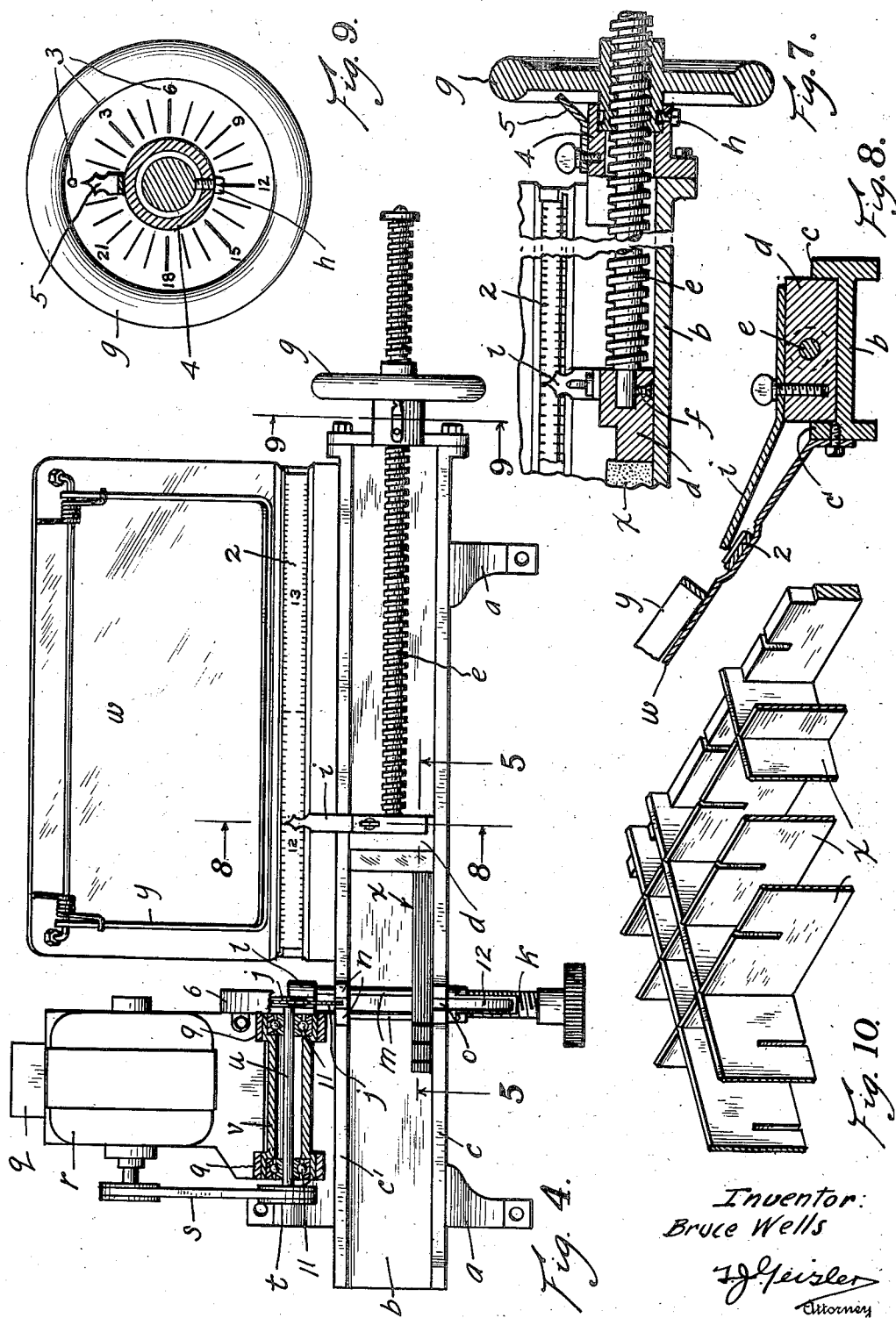
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UNITED STATES PATENT OFFICE

1,999,381

CROSS RULE SLITTING MACHINE

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2 Claims. (Cl. 90—15)

My invention relates to machines for cutting slits in metal bars to be made up in so-called "cross-rule printing forms" as used for printing ruled lines on account-book sheets, and the like.

These printing forms, as well known, consist of a number of metal bars, or so-called "rules", the edges of which form printing faces; these rules being assembled by slitting the same at the points where they are to be interlocked crosswise of each other, and then inserting the slitted portions of the rules one within the other.

In making these cross-rule forms it has been the practice first to measure and mark the rules according to the "layout" to be made, and then to slit the rules by suitable means; but such measuring and marking is time consuming, and frequently introduces errors, or inaccuracies, requiring the work to be done over again.

The object of my invention is to provide a machine which is operable relatively to a gauge, or a copy, so that the slits of the rules will be accurately located.

A further feature of my invention is, the saw is operated between lubricant apply swabs, provided in a hood inclosing the top of the saw, so as to keep the saw in best condition for cutting accurate slits.

The details of construction and operation of my machine are hereinafter fully described with reference to the accompanying drawings.

In the drawings:

Fig. 1 shows a front elevation of my machine partly in section;

Fig. 2 shows a left end elevation of my machine with reference to Fig. 1;

Fig. 3 shows a transverse section taken on the line pointed to by the arrow 3 in Fig. 1;

Fig. 4 shows a plan view of my machine agreeing with Fig. 1;

Fig. 5 shows a fragmentary, longitudinal, vertical section on the line 5—5 of Fig. 4, to illustrate the function of the gauge-block in positioning the rules relatively to the cutting plane of the saw;

Fig. 6 shows a perspective sectional detail of the particular means for clamping the rules in place for slitting;

Fig. 7 shows a larger scale sectional detail of the means for advancing and retracting the gauge-block, also showing the supplementary gauge element of my machine;

Fig. 8 shows a fragmentary section taken on the line pointed to by the arrow 8 of Fig. 4;

Fig. 9 shows an elevation of the graduated face of the gauge-wheel, showing the operation of the

supplementary gauging element of my machine; Fig. 10 is an illustration of the work done by my machine; and

Fig. 11 shows a transverse section taken on the line 11—11 of Figs. 1 and 5 illustrating the adjustability of the axis of rotation of the saw to compensate for wear.

My machine consists of a table *a* on which is mounted a slideway *b* against the front side *c* of which the rules, indicated by *x*, are placed as shown in Figs. 2, 3 and 4. A gauge-block *d* is slidable in the slideway *b* by means of a screw *e*, to the front end of which a gauge-block is secured by a set screw *f*. On the screw *e* is rotatably mounted a gauge-wheel *g*; the boss of the latter being provided with a circumferential groove in which bears a set screw *h*, thereby holding the gauge-wheel *g* rotatably in place, and hence its rotation moves the screw longitudinally.

The gauge-block *d* carries a pointer *i*. By manipulating the gauge-wheel *g* the gauge-block *d* is first retracted to permit the placing of the set of rules *x* in front of the cutting plane of the saw *j*. This operation is illustrated by Fig. 5.

The set of rules having been properly positioned, they are clamped in place. For such purpose I provide the table *a* with a set-screw *k*, carrying an arm *l*, provided with spaced clamping rods *m*, bearing in the spaced bearing-lugs *n* provided on the rear wall *c'* of the slideway *b*. The arm *l* has a slot *l'* in which slot and the space between the bearing lugs *n*, the saw *j* operates. The ends of the clamping rods are moved towards and from the front wall *c* of the slideway *b*, and in that way serve to clamp the rules *x* in place.

The front wall *c* of the slideway *b* is also slotted as at *o* to provide a passageway for the saw *j*.

The saw carriage *p* is slidably mounted on a bracket *q*. The carriage carries a motor *r*, from which runs a belt *s* to a pulley *t* carried by the saw-arbor *u* rotating in a bearing *v*. Thus after the rules have been clamped in place, the saw *j* may be manually drawn forward across the rules, slitting them, and the saw is then returned to its initial position. The clamping screw *k* is then turned to release the clamping rods *m*, and the gauge-wheel *g* is operated to advance the screw *e* and therewith the gauge-block *d* to position the rules for making the next slit. The clamping screw *k* is then again operated to clamp the rules again in place, and the saw operation for making the next slit in the rules is repeated.

Since the saw *j* will become worn in time, and it is necessary to slit the rules a definite sufficient depth, I provide means for lowering the saw as

worn. These means consist in supporting the bearing *v* of the saw-arbor eccentrically, as illustrated in Fig. 11. The bearing *v* is rotatably supported by split yokes 9 provided with set screws 10. The arbor *u* of the saw is rotatably supported in the bearing *v* by roller bearings 11. The bearing *v* may thus be partially rotated as required to adjust the axis of rotation of the saw relatively to the required depth of cut, and then the saw is clamped in place in the slit yokes 9.

The gauging of the rules so as to locate relatively the successive slits therein may be done by copy, or with reference to a gauge-rule. When making the slits with reference to a copy, the copy would be clamped in place on a copy holder *w*, by a clamping bar *y*, as shown in Figs. 1 and 5, and the pointer *i* of the gauge-block *d* would then be placed in registration with the right end of the model sheet *z*, to duplicate which the cross-rule printing form is to be made.

The pointer *i* would then be advanced by manipulation of the gauge-wheel *g* so as to place the same in registration with the successive vertical lines of the model sheet *z*, and thus cause the saw to slit the rules correspondingly.

The operation so far described would produce the slits of the horizontal rules of the model sheet. For slitting the vertical rules, the sheet would, of course, be turned so as to be able to arrange the pointer *i* in registration with the points of intersection of the vertical lines of the sheet.

Where the slitting of the rules is to be done without a copy, the pointer would be operated over a gauge-rule 2 which may be removably secured to the base of the copy holder *w*. The gauge rule 2 may be provided with graduations on both its top and bottom edges, thus providing a series of gauges, graduated with reference to "points" or other arbitrary, convenient measurements.

Where accurate work is required, the operator must make sure that the pointer *i* of the gauge-block *d* is placed in accurate registration with the lines of the model sheet *z*, or with the graduation marks on the scale 2. In order to check up such registration, and make sure that it is correct, the gauge-wheel *g* is provided with radial graduations 3, as 0, 3, 6, etc.; and the bearing 4 of the gauge-wheel *g* is provided with a pointer 5. These graduations of the gauge-wheel *g* may also be arranged with reference to points. Thus by checking the position of the pointer 5, with reference to the graduations on the gauge-wheel *g*,

with the pointer *i* of the gauge-block *d* accuracy in the location of the slits to be made in the rules is assured.

In order to assure that the saw *j* will make neat slits in the rules, and thus facilitate their accurate and firm assembly as shown by Fig. 10, I deem it desirable that the sides of the saw run between swabs holding lubricant. For this purpose the saw is provided with a hood 6—incidentally also serving as a guard to prevent inadvertent contact with the saw. The hood has a cup 7 thru which oil may be introduced, and the sides of the hood hold swabs 8 kept moistened with the oil. In that way the saw is kept in good condition, and the slits made by it are neat and clean. A guard 12 protects the operator against inadvertent contact with the saw while drawn forward.

The details of construction above given are to be understood as merely giving one complete embodiment of my invention, but variable by the builder of the machine within the scope of my invention.

I claim:

1. In a cross rule slitting machine comprising, a table provided with a slideway adapted to hold rules longitudinally movable, means for clamping the rules in place in said slideway, such means comprising a transverse screw journaled in the table, said screw carrying a vertical arm, spaced clamping rods carried by said arm, sliding in bearings provided on said slideway, said arm and said bearings being slotted to permit the passage of the saw, a driven slitting saw movable across said slideway, said arm and said slideway being adapted to receive the saw.

2. A cross rule slitting machine comprising a table provided with a slideway adapted to hold rules longitudinally movable; means for clamping the rules in place in said slideway, such means comprising a transverse screw journaled in the table, a vertical arm carried by said screw and spaced clamping rods carried by said arm sliding in bearings provided in said slideway, said arm and said bearings being slotted to permit the passage of a driven slitting saw; said saw movable across said slideway, said slideway being adapted to receive the saw; means for advancing the rules in said slideway relatively to the cutting plane of said saw, means for gauging the advance of the rules.

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