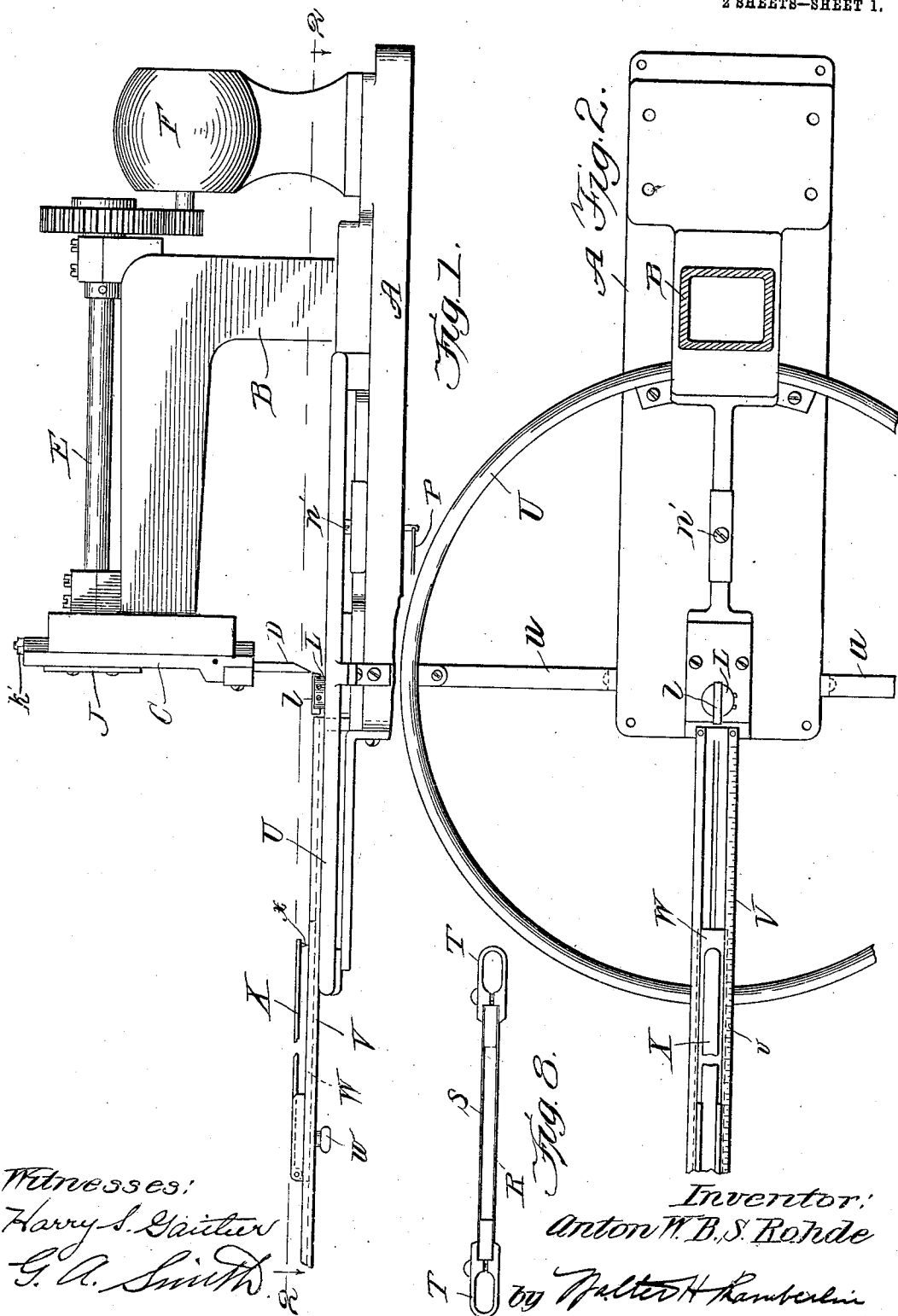


A. W. B. S. ROHDE.
MACHINE FOR CUTTING SHEET METAL INTO IRREGULAR FORMS.
APPLICATION FILED SEPT. 14, 1908.

937,865.

Patented Oct. 26, 1909.
2 SHEETS—SHEET 1.



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937,865.

2 SHEETS—SHEET 2.

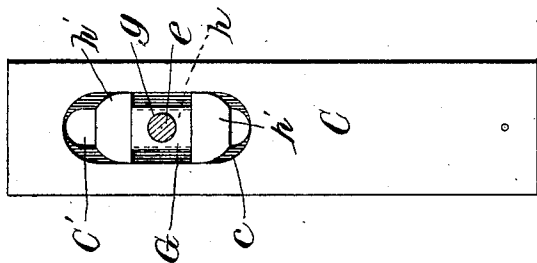


Fig. 5

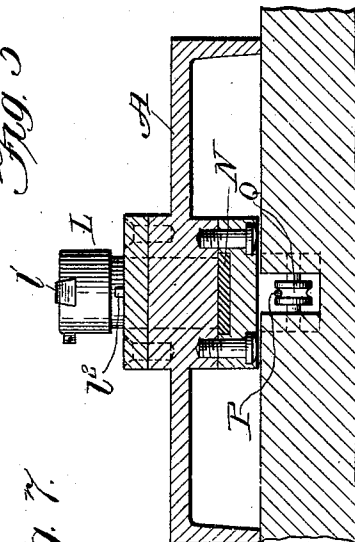


Fig. 6.

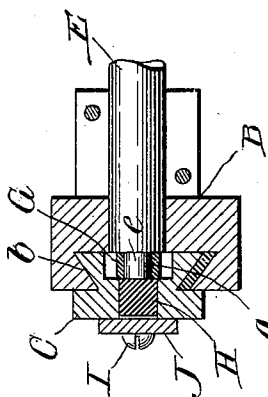
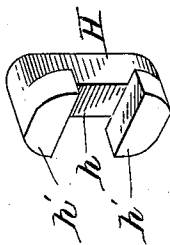


Fig. 4.



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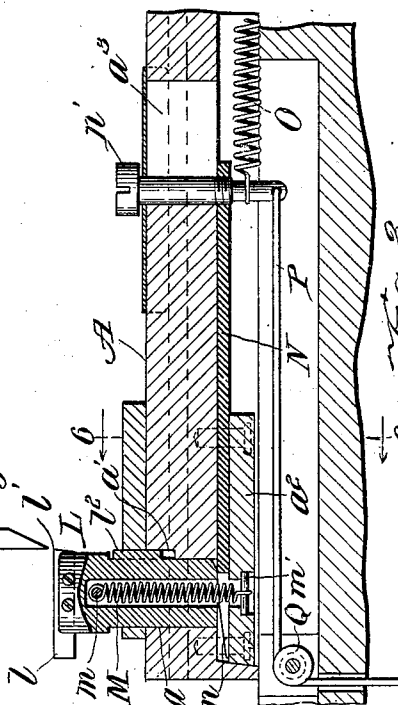
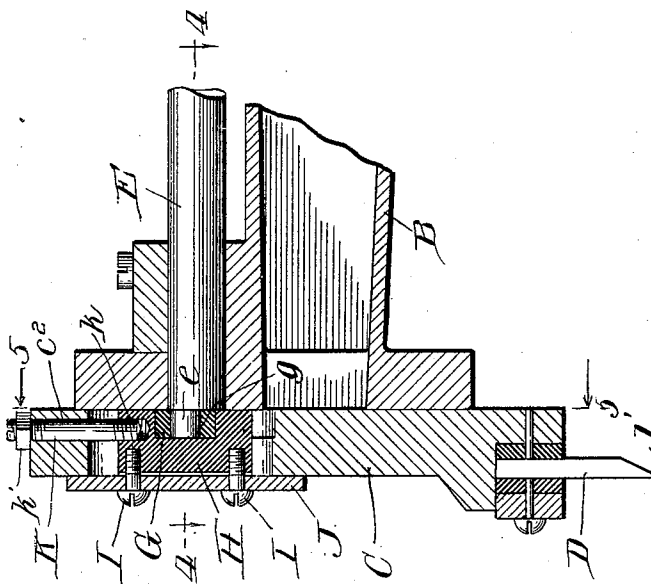


Fig. 3.

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UNITED STATES PATENT OFFICE.

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MACHINE FOR CUTTING SHEET METAL INTO IRREGULAR FORMS.

937,865.

Specification of Letters Patent.

Patented Oct. 26, 1909.

Application filed September 14, 1908. Serial No. 452,893.

To all whom it may concern:

Be it known that I, ANTON W. B. S. ROHDE, a citizen of the United States, residing at Chicago, in the county of Cook, State of Illinois, have invented a certain new and useful Improvement in Machines for Cutting Sheet Metal Into Irregular Forms, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object to provide a simple and efficient machine whereby sheet metal can be cut into irregular shapes or forms of various kinds.

The various features of novelty which characterize my invention will hereinafter be pointed out with particularity in the claims.

For a full understanding of my invention and its object and advantages reference may be had to the following detailed description taken in connection with the accompanying drawings, wherein:

Figure 1 is a side elevation of a preferred embodiment of my invention; Fig. 2 is a section taken on line 2—2 of Fig. 1; Fig. 3 is a vertical section through a portion of the machine on a larger scale than Fig. 1; Fig. 4 is a section on line 4—4 of Fig. 3; Fig. 5 is a section on line 5—5 of Fig. 3; Fig. 6 is a section on line 6—6 of Fig. 3; Fig. 7 is a perspective view of a detail; and Fig. 8 is an end view showing a strip of sheet metal to be operated upon and a templet for determining the lines upon which the cutting is to take place.

Referring to the drawings, A represents a base member of any suitable construction, this member being conveniently made flat so that it may be set upon a table or work bench. Projecting upwardly from the base member is an over-hanging arm B also of any suitable construction. The arm is provided at its outer end with an elongated vertical guide *b* which is preferably, though not necessarily, dovetailed in cross section.

C is an elongated cutter-head slidably mounted within the guide *b*. The cutter-head carries at its lower end a chisel-like tool D, held in place in any suitable manner. The cutter-head is adapted to be oscillated up and down in any suitable manner as, for example, by means of a pin *e* arranged ec-

centrically upon the end of a driving shaft E, this shaft being in turn driven by a suitable motor F. The pin *e* preferably projects into an opening *g* in a laterally slidable anti-friction bearing block G carried by the cutter-head; the arrangement being such that upon the rotation of the shaft the pin revolves about the axis of the shaft moving the cutter-head up and down while the bearing block slides laterally back and forth to compensate for the change in the lateral position of the driving pin.

I prefer to provide means for adjusting the cutter-head bodily with respect to the driving shaft so that the tool may be adjusted up and down. To this end I form in the cutterhead an elongated slot *c* within which is slidably mounted a block H. This block may consist of an elongated shank *h* which is adapted to be received within an auxiliary slot *C'* extended outwardly from slot *c* together with transverse bearing shoulders *h'* *h'* projecting laterally from one side of the body or shank and spaced apart far enough to receive between them the member G. The member H is placed in position from the rear and is held in place by means of a pair of screws I, which pass through a plate J lying against the front face of the cutter-head and enter the shank *h*. It will be seen that when the parts are assembled and the screws I tightened, the member H will be drawn inwardly into the cutter-head until the rear faces of the bearing shoulders *h'* engage with the solid portions of the cutter-head bounding the slot *C'*, the whole being rigidly locked together. The slots *c* and *C'* are longer than the member H so that the position of this member may be shifted longitudinally of the cutter-head. By the arrangement just described the member H is frictionally held in its adjusted positions and the parts may be readily designed so that the friction will be sufficient to maintain the desired adjustment during the operation of the machine. I prefer, however, in some cases to provide means for transmitting the blow upon the cutter-head directly to the driving member without relying upon the frictional engagement between the member H and the cutter-head. To this end I form a vertical opening *c*² in the cutter-head from the top into the slot *c* and pass a bolt K through this opening and into the member H. The bolt may be conveniently threaded into the member H, as at *k*,

and it may be provided at its upper end with a nut h' which is adapted to rest upon the upper end of the cutter-head. It will be seen that when the cutter-head moves downwardly and meets with an obstruction the stress is transmitted through the nut, the bolt, and the members H and G directly to the driving pin e .

At a point beneath the cutter-head there is mounted upon the base plate, a die or platen L upon which the work is supported while it is being acted upon. The die or platen preferably carries a detachable piece l of tool-steel or the like, which presents an edge l' past which and in close proximity to which the tool is adapted to play. The sheet metal which is being cut is laid upon the member l and the cutter is started so as to cause the tool to reciprocate up and down very rapidly. The tool forms with the member l a shearing device which cuts the sheet rapidly and smoothly as the sheet is moved step by step under the tool. In cutting a sharp angle the sheet is fed so as to make the cut along one side of the angle and then the sheet must be turned bodily so as to bring the edge of the tool into registration with the other line of the angle. In thus turning the sheet it is necessary to prevent the tool from making a cut, as it would be very difficult to prevent mutilation of the sheet. At the same time it is not desirable for the sheet to be removed entirely from the machine as this would be a waste of time. Furthermore, it would be undesirable to completely stop the machine since this would also produce disadvantageous delays. In order to make it possible to turn the material which is being operated upon without danger of accidentally injuring it, without removing it from the machine, I make the die adjustable in a vertical direction so that when the operator comes to a sharp turn or corner he need only operate a handle or a treadle to carry the material out of the range of the tool, returning it again in the same manner. The die may conveniently consist of a cylindrical plug slidably mounted in a vertically extending hole a in the base plate. The die may be provided with a feather l^2 which enters a key-way a^2 in the base member and prevents the die from rotating. The die may conveniently be made hollow so as to house the spring M which is secured at its one end to the die, as at m , and at its other end to a fixed portion of the machine at m' . When free to do so the spring draws the die downwardly a sufficient distance to prevent the tool from dropping to the level of the top of the die while in operation; consequently any work lying upon the die will be out of operative relation to the tool while the die remains in its lowermost position. The die may be moved upwardly in any convenient manner as, for ex-

ample, by means of a plate N which is made wedge shape as at n at its front end, the plate being supported and guided upon a fixed portion a^2 of the machine in such position that when the plate is moved into the position shown in Fig. 3, the wedge shaped end thereof rides under the die and lifts it bodily against the tension of the spring. A spring O tends normally to hold the plate N in its retracted position, namely—the position wherein it is clear of the die and the die is free to assume its lowermost position. The plate may, however, be moved into and held in the position shown in Fig. 3 by means of a cord or chain P secured to the plate and passing over a pulley Q, on the support for the machine and then to a treadle of the controlling device.

It will be seen that normally the spring O holds the wedge plate retracted so that the die assumes its lowermost position. After the operator has placed a piece of work upon the die and started the tool he places his foot on the controlling member for the rope P, shifting the wedge plate laterally and forcing the die upwardly. He then slides the work across the top of the die as fast as the tool is able to cut and, when a sharp turn or corner is reached, he releases the treadle or controlling member and the die automatically drops; he can now turn the work upon the die without danger of making an unintentional cut and as soon as the work is again properly positioned he can bring it into operative relation by actuating the treadle or other controlling member.

A convenient method of guiding the tool so as to follow the proper outline on the work is to clamp upon the work R a templet S as indicated in Fig. 8, the templet being held parallel with and at a slight distance above the work so that its edge forms an abutment against which the side of the tool may bear. In operation the templet is held against the side of the tool and the work is gradually moved along while maintaining the engagement between the templet and the tool. The clamps T—T are preferably so arranged that the templet is held at a position above the work greater than the distance which the tool moves in the forward direction above the work; there is, therefore, no danger that the cutting edge of the tool will engage with the templet and injure it.

I prefer to provide a rest or support U which will carry a part of the weight of the work which is being operated upon and thereby relieve the operator. This rest may conveniently take the form of a rod or tube bent into a circular ring and fastened to the base of the machinery by means of stays u .

It is often desirable to be able to cut a sheet upon an arc of a circle or to make a

circular disk without going to the trouble of making a templet. To this end I provide an elongated guide V upon which is mounted a slide W. This slide may be locked in any desired position upon the guide by means of the set screw *w*. Hinged to the outer end of the slide is an arm having at its free end a pin or center *x*. When it is desired to cut a circular disk from sheet metal or to form an arc-shaped cut, the slide is adjusted so as to bring the pin or center *x* at the desired distance from the cutting edge of the tool when the member X is in the position indicated in Figs. 1 and 2. The work is then laid upon the slide and the hinged arm is swung into position until the pin or center engages with the work, perforating it if necessary. The machine may then be set in operation and the work swung about the pin or center as the cutting progresses until the entire operation is complete. Normally, when a templet is being employed, the hinged arm is swung backward so as to be out of the way of the work. If desired, the spring O and the controlling member P may be omitted, thereby permitting the slide or plate N to remain in any position into which it may be moved. In this case the slide may be controlled by a stem *n'* projecting therefrom through a slot *a*³ in the base. When the operator desires to bring the die or plate into working position he moves the member *n'* into the position indicated in Fig. 3 where it remains until it is again manually actuated toward the other end of the slot. Even where the retracting spring for the slide and the controlling chain or cable are employed, the member *n'* can be used to advantage as a limiting stop for the slide.

While I have described in detail only a single form of my invention I do not desire to be limited thereto for in the broader aspect my invention may take various other forms as will be evident from the terms employed in the definitions of my invention constituting the appended claims.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a machine of the character described, a reciprocating tool, a platen arranged beneath the tool, a spring tending to move said platen away from the tool in the direction of movement of the tool, and means for moving the platen toward the tool and rigidly supporting it against return movement.

2. In a machine of the character described, a base, a tool supported above the base, a platen slidably mounted in the base so as to be capable of movement from and toward the tool, a rigid abutment beneath said platen, and a wedge device arranged to

slide between said abutment and the lower end of the platen to raise the platen.

3. In a machine of the character described, a base, a tool, supported above the base, a platen slidably mounted in the base so as to be capable of movement from and toward the tool, a rigid abutment beneath said platen, and a spring for retracting the platen.

4. In a machine of the character described, a frame, a tool, a pin or center, and means for securing said pin or center to the frame at any desired distance from the tool.

5. In a machine of the character described, a frame, a tool, a guide on said frame extending radially from the tool, a member slidably mounted on said guide, and a pin or center carried by said member.

6. In a machine of the character described, a frame, a tool, a guide on the frame extending radially from the tool, a slide mounted on said guide, a yieldable arm on said guide having a free end projecting toward said tool, and a pin or center carried upon the under side of the free end of said arm.

7. In a machine of the character described, a frame, a tool, a guide on the frame extending radially from the tool, a slide mounted on said guide, an arm hinged at its outer end to said slide and adapted to be swung into a position wherein its free end is directed toward said tool, and a pin or center carried by said arm on the side which is adjacent to said guide when the arm is in the aforesaid position.

8. In a machine of the character described, a base, an overhanging arm projecting upward from said base, a vertically movable tool carried upon the free end of said arm, a work-supporting platen carried by said base beneath said tool, and an annular frame supported upon said base and surrounding said platen.

9. In a machine of the character described, a frame, a tool, a guide on said frame, a member slidably mounted on said guide, an arm hinged to said member, and a point or center mounted on said arm.

10. In a machine of the character described, a tool, a platen located beneath the tool and arranged to be movable up and down, a spring tending to move the platen in the downward direction, a support, a wedge device arranged between said support and the lower end of the platen and means for moving said wedge device transversely to the direction of movement of the platen.

In testimony whereof, I sign this specification in the presence of two witnesses.

ANTON W. B. S. ROHDE.

Witnesses:

WM. F. FREUDENREICH,
HARRY S. GAITHER.