

# VARIETY OF METAL STAMPINGS FOR REMINGTON RAND PORTABLE TYPEWRITERS

Produced to Close Tolerances on U. S. "Multi-Slide"  
Machines With Appropriate Tooling

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**T**HE REMINGTON RAND PORTABLE TYPEWRITER, as manufactured at its plant in Elmira, N. Y., is a precision machine and involves the production of 491 different parts, many of which are metal stampings. These stampings must be held to close tolerances for proper assembly and functionability. Some are of complicated form and secondary operations would have been necessary if the parts had been produced on conventional presses.

Because of the quantities required and the dimensional tolerances which had to be maintained, Remington Rand decided upon the installation of "Multi-Slide" machines as manufactured by the U. S. Tool Co., Inc., Ampere (East Orange), N. J., for the production of certain of the stampings. Fig. 1 shows a number of parts produced by Remington Rand on "Multi-Slide" equipment, and a typical machine setup at the company is illustrated in Fig. 2.

The "Multi-Slides" are designed and built primarily for the production of formed stampings to close tolerances using coil stock. A feature of this type of machine is its ability to produce many different types of complicated

stampings complete in one operation. These machines are built in a convenient range of sizes, and for the parts being produced by Remington Rand, the No. 33 model, with capacity for material up to  $2\frac{1}{2}$  in. in width and feed length adjustable up to  $12\frac{1}{2}$  in., was selected.

## Principle of the Machine

**B**ASICALLY, a standard "Multi-Slide" machine is equipped with a feed unit, stock straightener, stock check, one horizontally operated press head which can be used for piercing, trimming, embossing, swagging, blanking, etc., four horizontal forming slides, 90 deg. apart and converging at one common point, and a vertical stripper mechanism. Looking down on the machine, the general arrangement is as shown in Fig. 3.

The versatility of the machine, however, is such that two or three press heads can be used simultaneously on the No. 33 model. This naturally means that when a good deal of cutting, trimming, etc., is required, the operation in the dies can be properly spaced to result in lowered tool maintenance and greater overall die life. Each press head is cam-actuated, and when multiple



Fig. 1—Typical parts produced on "Multi-Slide" press

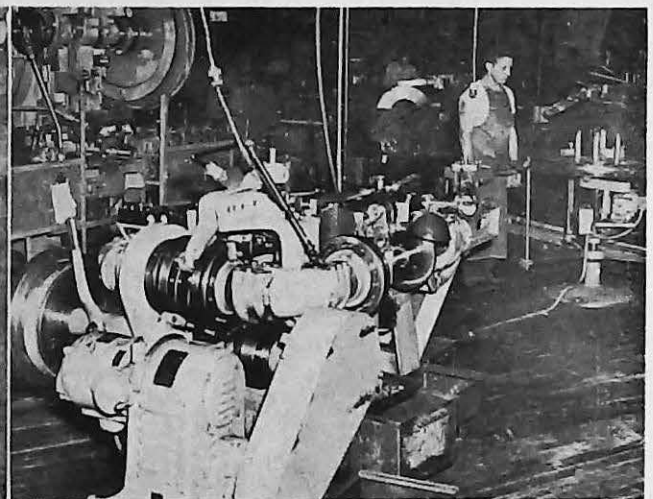


Fig. 2—"Multi-Slide" press in operation in the plant

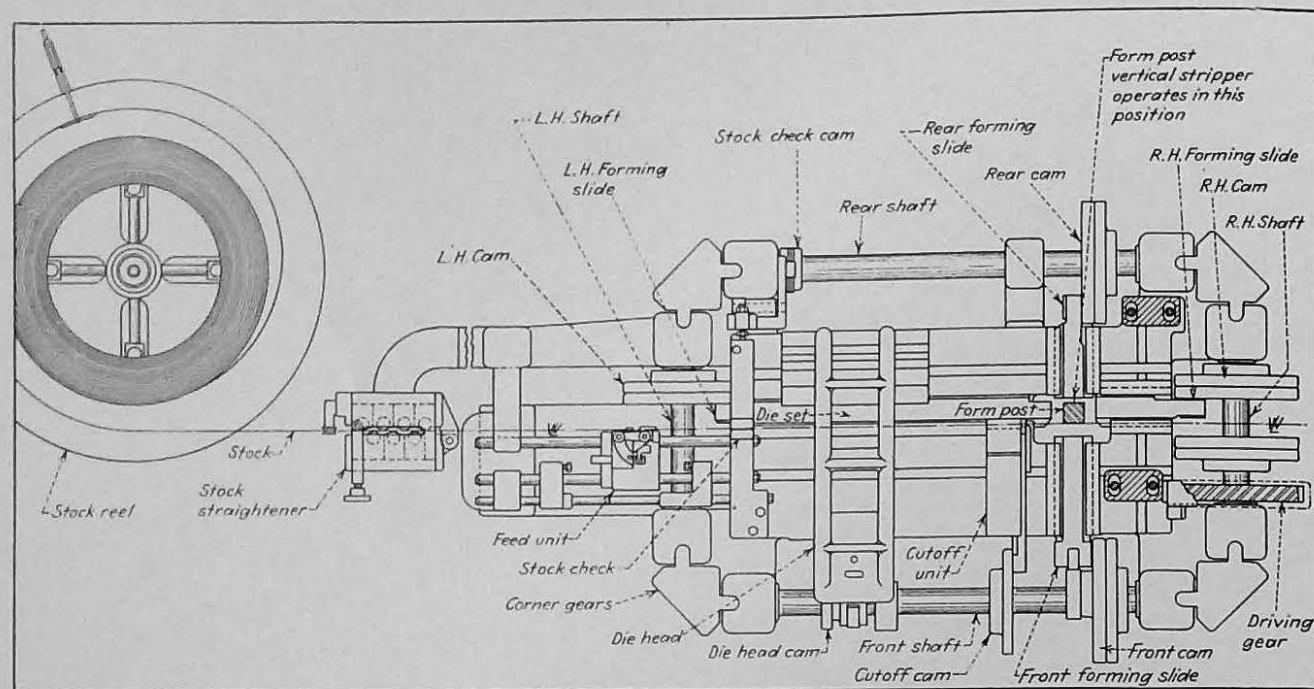
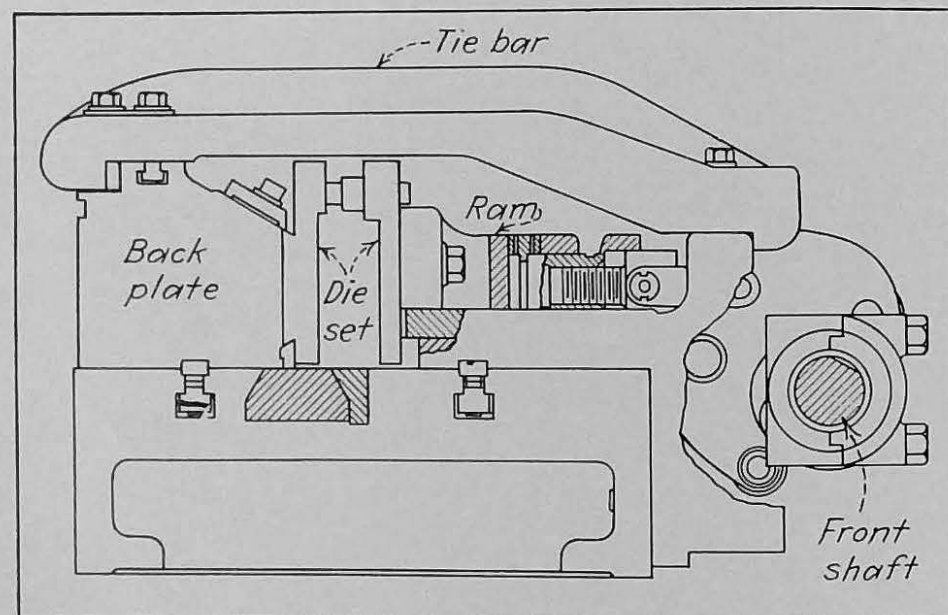


Fig. 3—Top view of machine with arrangement of feeding and die mechanism

Fig. 4 — Detail of die or press head looking from left side of machine



heads are employed, the timing of the cams is staggered so that the load is distributed. The number of press heads used is determined by the amount of cutting, trimming, etc., required to produce a particular part.

The dies for piercing, cutting, trimming, blanking, etc., are mounted in the press heads. The die member itself is generally stationary and bolted to a vertical back plate or bolster at the rear of the machine bed. The punch member is mounted to the cam-actuated ram slide of the press head at the front of the bed. See Fig. 4.

**T**HE MACHINE HAS a shaft system around the four sides of the bed and the shafts are joined at the corners by means of miter gears made of special alloy

steel. The forming slides and stripper unit are actuated from the shaft system by means of split-type cams. The use of split-type cams facilitates change-over from one job to another and also makes adjustment for timing a simple matter, as the cams can be correctly positioned without disturbing the shaft system of the machine. This drastically reduces down time and consequent loss of production.

The press heads are actuated by means of solid-type cams, inasmuch as in the fabrication of a general run of metal stampings from flat stock, the press head cam is not removed from the machine. Power is applied to the cam shaft system by means of gears and the flow of power is smooth, since the various operations are so

Fig. 5—Ribbon spool and strip layout for spool

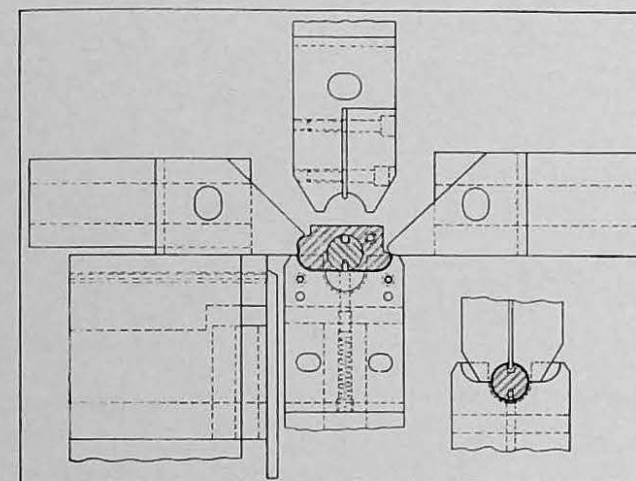
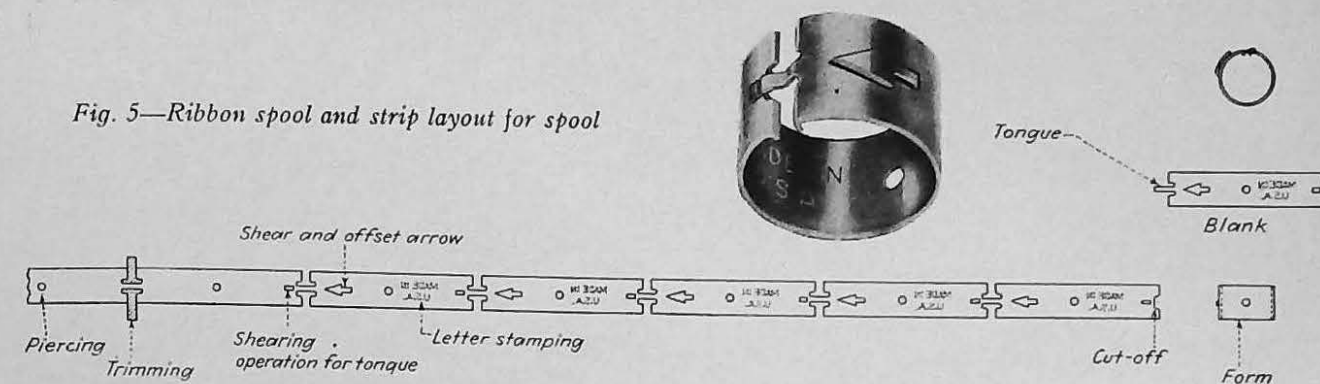


Fig. 6—Tool layout used in making ribbon spool

timed that they are well distributed and do not occur at a given instant, as with conventional presses.

**T**HE SOURCE OF POWER is a variable speed drive, of which the motor is an integral part. In the case of No. 33 "Multi-Slide," a 5 hp. motor is used. A brake unit controlled by micro switches is employed in such a manner that if a misfeed occurs for any reason, such as jamming, the machine is automatically and almost instantaneously stopped in order to prevent damage to the tools.

Auxiliary units which can be mounted on the machine to increase its versatility further, are described in the following:

**Rear Auxiliary Slide**—A horizontal slide actuated by means of a cam from the rear shaft of the machine. This is used for performing operations that require pressure in a direction opposed to that exerted by the press heads.

**Toggle Press**—A cam-actuated, horizontally operating unit for heavy-duty swaging, embossing, coining, or countersinking of pierced holes. One of these presses, providing pressures up to 100 tons, can be mounted on the Multi-Slide in place of a press head.

**Rear Positive Knockout**—Cam-operated from the rear of the machine and employed to provide a pre-loaded spring action during shearing. This attachment is used when a part is to be produced in multiple from the same strip of material. The original strip of material is sheared in the machine to the required number of individual strips.

For example, if the part can be produced four at a time, the original strip is sheared into four separate strips of equal width. The rear positive knockout as-

ures that the individual strips are properly aligned to prevent interference in feeding. The design of the part itself determines whether or not it can be produced in multiple.

**Cut-Off Slide**—A cam-operated unit employed where it is not advisable to separate the part from the strip in a press head. The cut-off slide is mounted between the press heads and the forming slides. When the blank is separated from the strip by means of the cut-off slide, it is immediately picked up by the forming slides.

**Positive Blank Holddown**—The unit used in the front forming tool position to hold the blank firmly against the form post after cut-off from the strip. It is employed mainly when producing parts made of heavier gage material which might have a tendency to spring back from the form post if not securely held in position. The positive blank holddown also reduces time in the cycle required for stripping, inasmuch as the stripping action can start as soon as the front tool clears the finished part.

## Method of Operation

**I**N OPERATION the material is fed into the machine in a vertical plane from a coil mounted on a motor-driven horizontal reel. The reel is arranged with a mercury switch control mechanism which starts and stops the motor. The purpose of the mercury switch control is to provide a loose loop of material between the reel and the feed mechanism on the "Multi-Slide."

The material is fed from the loose loop through a set of straightening rolls by means of an eccentric-operated slide feed mechanism. The slide block containing the blade which grips the material reciprocates on hardened and ground slide rods between definite adjustable stops, thus assuring controlled accuracy of feed.

The amount of material fed into the press head (or heads) is determined by the length of the blank required to produce the part. A cam-actuated stock check is mounted between the feed and the press head to prevent movement of the stock during the working cycle.

In the press heads the part may be pierced, trimmed, swaged, embossed or cut off. The exact operations are determined by the nature of the part itself.

After the press head operations, the blank is picked up by the forming slides where it is bent into the required shape. The cam-operated stripper is located over the forming position and has a variety of uses:

1. It can be employed to eject the piece after final forming around an arbor or form post.
2. In cases where it is necessary to form the part on more than one level, it is used to progressively lower the part on the vertical form post to each



forming level and then strip the finished part from the post.

3. In some instances the vertical stripper is used to perform a downward forming operation.

### Making Typewriter Ribbon Spools

FIG. 5 PROVIDES a practical illustration of how the "Multi-Slide" machine is used at Remington Rand in the production of typewriters. In this case, the part is a ribbon spool core which is made from cold-rolled steel  $\frac{1}{2}$  in. wide by approximately 0.023 in. thick. The exact width of material is used, and there is no trimming on the side.

The equipment used for the production of this part is listed in the following:

1. Standard No. 33 "Multi-Slide" machine with one press head, four forming slides with cam, stripper mechanism with cam, feed unit, stock check and stock straightener
2. Cut-off slide with cam
3. Rear auxiliary slide with cam
4. Set of tools for the ribbon spool core

Fig. 5 also shows the strip layout and Fig. 6 the tool layout, illustrating the operations in the machine which are as follows:

1. **Press head operations**
  - a. Pierce round hole.
  - b. Trim.
  - c. Shear opening for tongue; shear and offset the arrow. Note that this is done from the rear of the machine by means of the rear auxiliary slide.

The pressure with the rear auxiliary slide is in the direction opposite to that exerted by the press head.

- d. Stamp "Made in U.S.A."
2. **Separate blank from strip using cut-off slide.**
3. **Forming operations**
  - a. Preform using front, rear and lefthand tools around preform post.
  - b. Preform post is now raised by means of the stripper mechanism and the right and lefthand slides are retracted.
  - c. The front and rear forming slides now advance to finish-form the part around a stationary form post. The secondary advance of the front forming tool is provided by means of a two-lobe cam in the front forming position. At this stage the tongue end of the blank slips into the previously slit opening. In this position the rear tool is employed to lock the tongue in the slot and set the diameter of the part to the required dimension.

In this tooling setup observe the use of the rear auxiliary slide operating from the rear of the machine in conjunction with the press head. The press head coming in from the front pierces the round hole, trims to arrange for the tongue, and stamps the words "U.S.A." The opening for the insertion of the tongue (when finally formed) and the offset arrow require a pressure to be exerted in a direction opposite to that provided by the press head. The cam-actuated rear auxiliary slide is used for this purpose.

An interesting point to observe in the forming position is the use of a two-lobe cam with the front forming tool. The second lobe on the front cam provides the additional advance required for final forming. *The End*

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