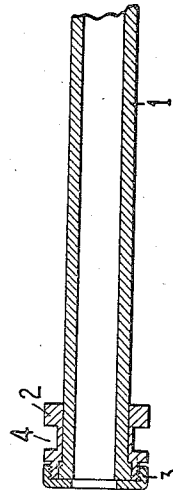
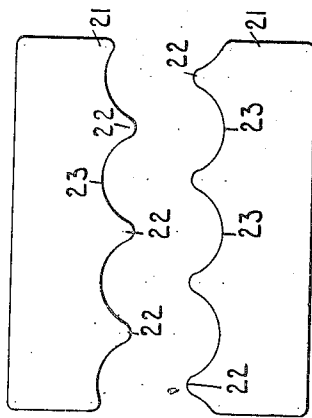
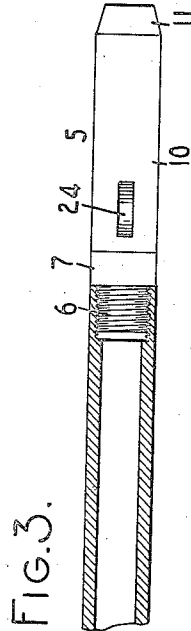
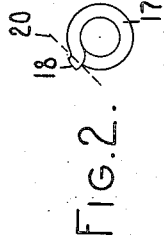
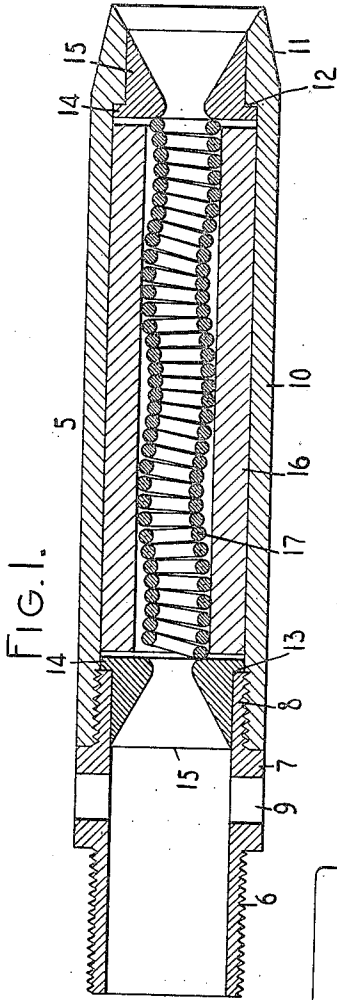


C. E. WARNER, SR. & A. J. SHETLAND.
 FEEDING DEVICE FOR METAL WORKING MACHINES.
 APPLICATION FILED SEPT. 9, 1913.

1,127,129.

Patented Feb. 2, 1915.



WITNESSES:

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FIG. 4.

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FEEDING DEVICE FOR METAL-WORKING MACHINES.

1,127,129.

Specification of Letters Patent.

Patented Feb. 2, 1915.

Application filed September 8, 1913. Serial No. 788,813.

To all whom it may concern:

Be it known that we, CHAUNCEY E. WARNEE, SR., and ANDREW J. SHETLAND, citizens of the United States, and residents of Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Feeding Devices for Metal-Working Machines, of which the following is a specification.

Our invention relates to feeding devices for metal working machinery and especially for machinery of the general class commonly known as turret lathes or screw machines.

The invention has for its principal object to provide an improved feeding finger for feeding the stock in these machines.

The invention is here shown in a form suitable for use in a Brown & Sharpe automatic metal screw machine but it is applicable or adaptable to other machines.

To the above and other ends our invention consists in certain features of construction and combinations and arrangements of parts, all of which will be fully set forth herein and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal central section through a feeding finger constructed in accordance with our invention. Fig. 2 is an end view of a spiral spring used in said construction as said spring appears at one stage of its manufacture. Fig. 3 is a longitudinal view, partly in section, of our feeding finger applied to the feed tube of a Brown & Sharpe automatic screw machine. Fig. 4 is an end view of a pair of dies used in the manufacture of our feeding finger. Figs. 1 and 2 are on a scale larger than Fig. 3 and Fig. 4 is on a scale larger than that of Fig. 3 and smaller than that of Fig. 1.

In Fig. 3 we have shown the feed tube 1 of a Brown & Sharpe automatic screw machine. This at its outer end is formed with a shoulder against which a collar 2 is drawn by means of a cap 3 having an internal thread that engages an external thread on the collar 2, said cap having a flange or web that contacts with the end of the tube 1. In the screw machine the tube 1 is inserted in the hollow spindle and a latch or dog, mounted on a reciprocal part of the machine, is adapted to engage in a peripheral slot 4 in the collar 2. Said reciprocatory part is moved at suitable intervals back and forth to move the tube 1 in and out, and this

movement can be effected by hand or automatically. Our feeding finger 5 is provided, like other feeding fingers, with a threaded nipple 6 which is screwed into the inner end of the tube 1. The stock is inserted into the outer end of the tube 1 and is pushed through the feeding finger and thence through the chuck of the machine, which chuck is alternately closed and opened, the inward motion of the tube 1 taking place at a time when the chuck is open and its outward motion at a time when the chuck is closed, so that the stock is fed forward a suitable distance, which distance is controlled by adjustable devices on the machine. All of this coöperating mechanism is so well known in the art that we have not deemed it necessary to illustrate it here and we have shown the tube 1 only to illustrate in a sort of conventional way a means to reciprocate the feeding finger. As far as our invention is concerned, all of this coöperating mechanism can be of any usual or suitable character. However, the actuating mechanism for this tube may be the same as is shown in the patent to Worsley, No. 543,606, July 30, 1895; or as embodied in the regular Brown & Sharpe machine before referred to.

The threaded nipple 6 constitutes a part of a plug or coupling 7, which coupling has, besides the threaded nipple 6, another threaded end 8, and between the two threaded parts is a cylindrical part of greater diameter and through which is formed a hole 9 for coöperation with a spanner or other suitable device for use in screwing the parts together or unscrewing them. A container 10 is formed at one end with an internal thread adapted to be screwed on to the end 8 of the coupling 7; and the opposite or free end of said container is tapered as shown at 11. Internally, said container is formed near its free end with a shoulder 12 and a like shoulder 13 is formed by the end of the part 8. Each of said shoulders coöperates with an annular flange 14 at one end of a bell mouthed bushing 15, which bushing is abrupt or flat in its inner face and has its outer face turned on a taper in a bell or funnel shape, as shown. Between the two bushings 15 there is mounted in the container a sleeve 16 within the bore in which is contained a spiral spring 17, which spring provides the friction that effects the feeding of the stock. The spring 17 is a close-wound spring and it is of a length as

near as may be just equal to the distance from one of the bushings 15 to the other. Said spring is wound in the usual way and cut off to suitable length; but the process of its manufacture preferably differs slightly from the ordinary in one respect, namely, that when the spring is cut off the end of it is bent out, as shown in Fig. 2, at 18 and the end of the spring is then ground or filed off along the line 20. When the spring is finished in this way there are no sharp edges to come in contact with the stock and the spring therefore does not scratch the stock at all. Moreover, these springs when first wound are straight and we prefer to crimp them somewhat and this can be conveniently done by slightly forming them between corrugated dies 21, shown in Fig. 4. These dies have ribs 22 on each die that register with the depressions 23 in the companion die; and when one of the springs is laid between the dies, lying from right to left in Fig. 4, said spring is crimped into the wavy form shown in Fig. 1. It is the function of the sleeve 16 to prevent the spring from buckling to such an extent as to interfere with the insertion of a new piece of stock, and the internal diameter of said sleeve is made a little greater than the external diameter of the spring and such as to perform this function.

It is the practice in the use of metal screw machines and similar machines, to have on hand a number of feeding fingers any one of which can be screwed into the feed tube of the machine, these feeding fingers being adapted for stock of different sizes. The same thing is true of our device, that is to say, it is necessary, in case stock of a number of different sizes is being worked in the machine, to have different friction springs 17 adapted to the various sizes of stock. The spring used with any given size of stock can have an internal diameter slightly greater than the external diameter of the stock, the friction being applied by the crimping or buckling of the spring. For example, we have sometimes made the internal diameter of the spring about 0.004 inch greater than the external diameter of the stock. We find in practice that the relation of the internal diameter of the tube 16 to the external diameter of the spring, can vary to a certain extent so that several springs can, if need be, be provided for one sleeve; or at least for sleeves of the same internal diameter. In using this invention in a No. 00 Brown & Sharpe machine, we have found that a sleeve of given internal diameter is adapted for different sizes of stock within a range of somewhere in the neighborhood of 0.020 inch. For example, one sleeve can be used for stock ranging from 0.055 to 0.075, inclusive, in diameter. For stock from 0.076 to 0.095 a slightly

larger sleeve is used. As was said above, it might easily happen that several springs 17 would be adapted for one sleeve. It will, of course, be understood that the equipment of the machine can, if desired, consist of a single container 10 and a set of sleeves 16 of graduated sizes and a set of springs 17, each one of a size appropriate to some particular size of stock that is in use in the particular shop under consideration, and also bushings 15 of different sizes would be required. On the other hand, it is possible, if preferred, to provide a larger number of the containers 10 with a complete equipment made up in each container for a particular size of stock. In changing from one stock to the other in this event the coupling 7 will be unscrewed from the feed tube and a new feeding finger put on; or, in case the different parts are kept separately, the container 10 can be unscrewed from the coupling 7 and a suitable set of bell-mouthed bushings 15, sleeves 16 and springs 17, all appropriate to the size stock to be used, can be inserted, this being the work of but a brief time. In order to facilitate the screwing and unscrewing of the container 10, said container is here shown with depressions 24 cut therein for cooperation with a spanner or grip of some suitable character.

With the feeding fingers heretofore employed with these machines, the friction is obtained by means of tempered spring fingers or extensions projecting forward from an integral solid body which is bored through to allow the stock to pass through the same between the spring fingers. These fingers are formed at their outer ends to fit the stock and feed it forward by the tension of the springs thereon. These wear rapidly and when worn present sharp edges which scratch the stock. They are more or less difficult and expensive to manufacture, requiring very careful and delicate tempering to be of the right shape and tension when finished. The device here described is easily, quickly and cheaply made, does not require tempering, is much more reliable and has no tendency at any time to scratch or mar the stock being fed. The only part of the device subjected to wear of a serious character is the springs 17 and these are very easily and quickly made at nominal expense.

Our device is more reliable and more durable than those heretofore in use, is less expensive to construct, is easy to renew, and easy to change from one size of stock to another.

Various changes can be made in the details of construction and arrangement without departing from our invention.

What we claim as new and desire to secure by Letters Patent, is:—

1. In a device for feeding stock, the com-

combination of a coiled spring adapted to have the stock inserted therein and by its friction to feed the stock, and a reciprocatory device to which said spring is connected.

5 2. In a device for feeding stock, the combination of a coiled spring adapted to surround the stock and by its friction to feed said stock, and a reciprocatory device to which said spring is connected, said spring
10 being crimped for the purpose specified.

3. In a device for feeding stock, the combination of a coiled spring adapted to have the stock inserted therein and by its friction to feed the stock, and a reciprocatory device
15 to which said coiled spring is connected, said spring having its ends bent outward as described to avoid scratching the stock.

4. In a feeding finger, the combination of a coiled spring adapted to surround the
20 stock and feed it by friction, a sleeve surrounding said spring and of an internal diameter slightly greater than the external diameter of the spring, and abutments at the ends of said spring to retain it within
25 the sleeve.

5. In a feeding finger, the combination of a coiled spring adapted to surround the stock and feed it by friction, a sleeve surrounding said spring and of an internal diameter
30 slightly greater than the external diameter of the spring, and abutments at the ends of said spring to retain it within the sleeve, said spring being crimped for the purpose specified.

35 6. In a feeding finger, the combination of a container, a sleeve within said container,

a friction feeding spring within the sleeve and abutments at the ends of said spring.

7. In a feeding finger, the combination of a container, a sleeve within said container, bushings at the ends of said sleeve, and a feeding spring between said bushings
40 and within said sleeve.

8. In a feeding finger, the combination of a container, and a coiled friction feeding
45 spring detachably mounted in said container.

9. In a feeding finger, the combination of a container, a sleeve detachably mounted within said container, and a coiled friction
50 feeding spring within said sleeve.

10. In a feeding finger, the combination of a container, a sleeve detachably mounted within said container, a coiled friction spring within said sleeve, and bushings at
55 the ends of said sleeve.

11. The combination of a feed tube, and a feeding finger detachably mounted on said tube and comprising a coupling device connected with said tube, a container connected
60 with said coupling device, a sleeve within said container, and a friction feeding spring within said sleeve.

Signed at Syracuse, in the county of Onondaga, and State of New York this 5th
65 day of September, A. D. 1913.

CHAUNCEY E. WARNER, Sr.
ANDREW J. SHETLAND.

Witnesses:

A. L. HOWES,
E. N. HARRIS.