F. E. BRIGHTMAN.

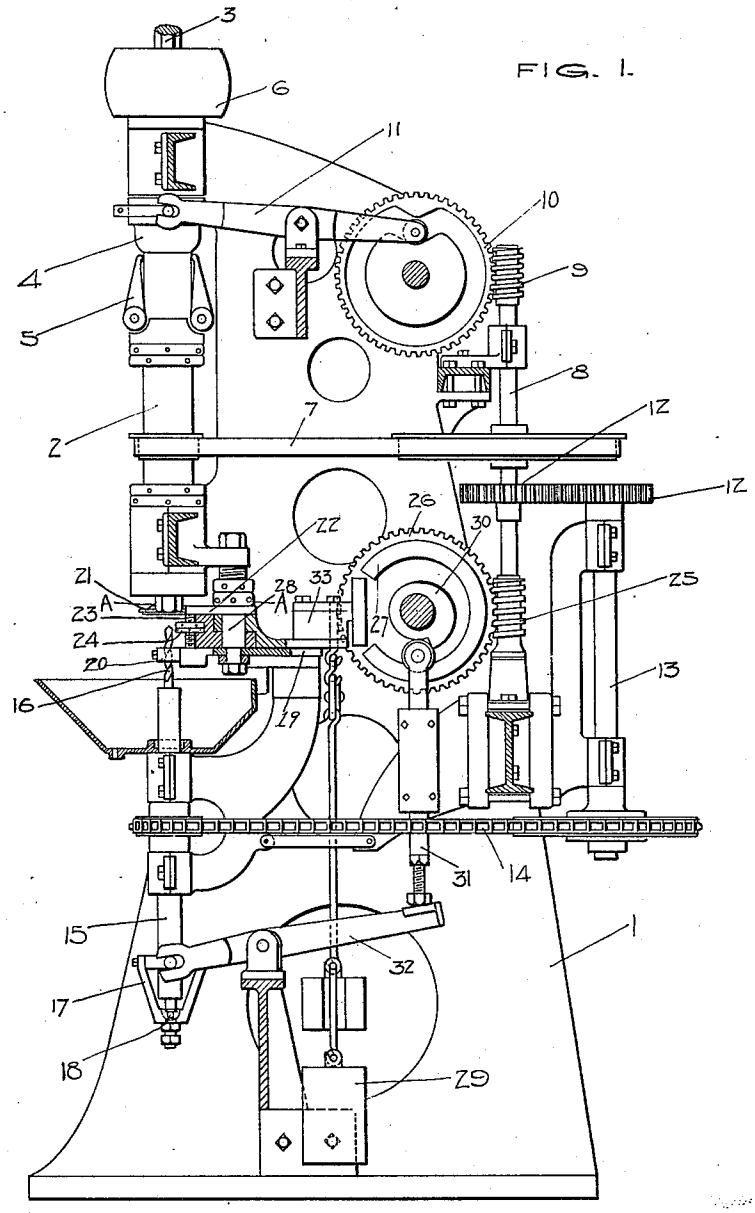
AUTOMATIC METAL WORKING MACHINE.

APPLICATION FILED SEPT. 1, 1910.

1,008,586. Patented Nov. 14, 1911.

2 SHEETS—SHEET 1.

FIG. 1.



WITNESSES:

Robert M. Sse

Jno. F. Oberlin

INVENTOR

Frank E. Brightman

BY

J. B. Fay

ATTORNEY

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

F. E. BRIGHTMAN.

AUTOMATIC METAL WORKING MACHINE.

APPLICATION FILED SEPT. 1, 1910.

1,008,586. **Patented Nov. 14, 1911.**

2 SHEETS—SHEET 2.

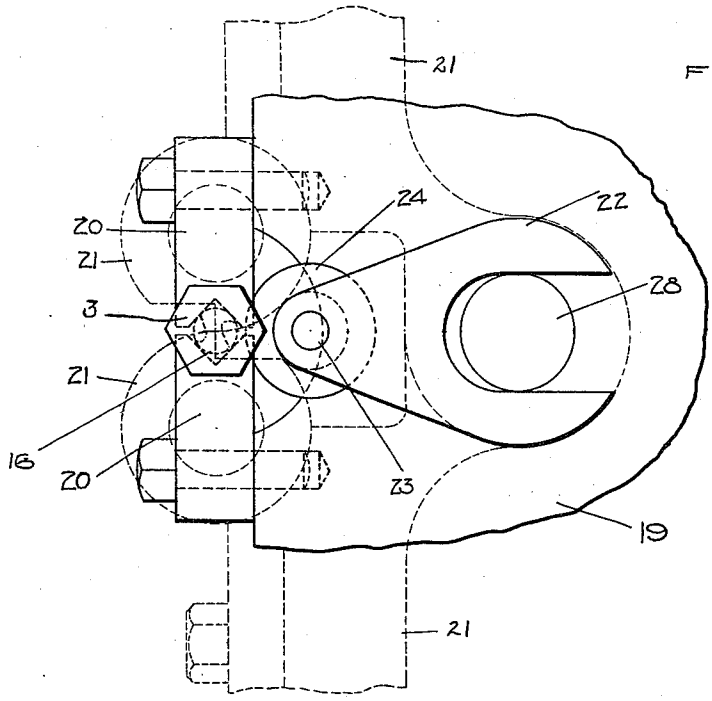


FIG. 2.

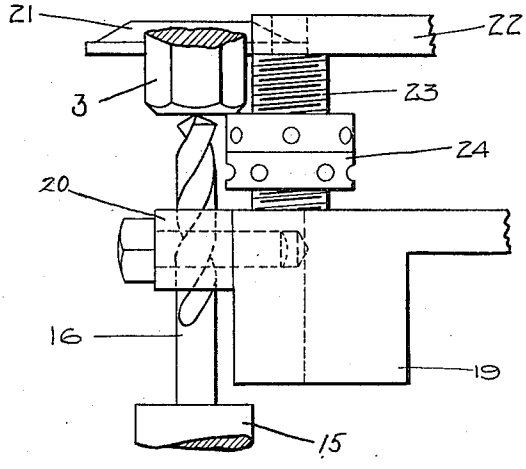


FIG. 3.

WITNESSES:

Robert M. Sage

Jno. T. Oberlin

INVENTOR

Frank E. Brightman

BY J. B. Fay

ATTORNEY

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANK E. BRIGHTMAN, OF SANDUSKY, OHIO, ASSIGNOR TO THE BRIGHTMAN HAMMERED NUT AND MANUFACTURING COMPANY, OF SANDUSKY, OHIO, A CORPORATION OF OHIO.

AUTOMATIC METAL-WORKING MACHINE.

1,008,586. Specification of Letters Patent. Patented Nov. 14, 1911.

Application filed September 1, 1910. Serial No. 580,108.

To all whom it may concern:

Be it known that I, FRANK E. BRIGHTMAN, a citizen of the United States, and a resident of Sandusky, county of Erie, and State of Ohio, have invented a new and useful Improvement in Automatic Metal-Working Machines, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to automatic metal working machines and in particular to that class of machines which are designed to successively form similar articles from a rod.

The present invention is an improvement on the machine disclosed in United States Patent No. 937,762 granted to me October 26, 1909.

The improvement relates particularly to the means for gaging the feed of the stock and to the means for supporting the tool during its work.

Other improvements will appear during the detailed description.

To the accomplishment of these and related ends said invention, then, consists, of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:—Figure 1 is partly a side elevation and partly a vertical section of a machine embodying my invention. Fig. 2 is a broken section on the line A—A in Fig. 1, the knives being shown in dotted lines; and Fig. 3 is a side elevation of a detail of the machine and partly broken away.

My invention is illustrated herein in a machine designed for cutting successive nuts from a bar of stock and drilling them at the same time. The machine will comprise a plurality of similar individual machines, and as these are duplicates of each other, one only has been shown in the drawings.

The machine comprises end supports 1 in which is journaled a vertically disposed rotatable spindle 2, which is hollow and through which the stock 3 is fed by gravity. A vertically reciprocable cone sleeve 4 is mounted on the spindle 2, and by its reciprocation the sleeve 4 operates the arms 5 which, in turn, reciprocate a sleeve carried within the spindle 2. The inner sleeve which is not shown constitutes, in conjunction with the spindle 2, the ordinary chuck mechanism which intermittently grips the stock. Power is transmitted to the machine through pulley 6 which primarily rotates the spindle 2, and by means of belt 7 rotates the shaft 8 which carries a worm 9. The worm 9 meshes with a gear 10 which carries a lateral cam track engaging a lever 11. Rotation of the gear 10 thus serves to reciprocate the cone sleeve 4.

The shaft 8, by means of gears 12, shaft 13, and chain 14, rotates a tool carrying spindle 15 which is disposed below, and alined with, the work carrying spindle 2. A socket 17 is supported from the lower end of the tool spindle 15 and is rotatable relatively thereto. Disposed between the lower end of the spindle 15 and the bottom of the socket 17, is a ball 18 which thus forms a bearing for the rotation of spindle 15 relatively to the socket 17.

A bracket 19 is rigidly secured to the supports 1, and to its outer end are secured two members 20 which extend toward, but are spaced from, each other. Their adjacent ends are recessed, and the opening formed by these recessed ends lies immediately above the tool spindle 15 and allows the tool 16 to extend therethrough during its operation. Two knives 21 are journaled on a vertical post 28 supported from the bracket 19 and the work carrying spindle 2.

An arm 22 is supported from the post 28, and at its outer end bears a vertical screw 23 on which is threaded a member 24. The member 24 extends into the path through which the stock 3 is fed, but lies to the side of the reciprocatory path of the tool 16. The member 24 thus forms an adjustable stop for gaging the length of the work fed from the work spindle.

The shaft 8 carries a worm 25 which meshes with a gear 26. Lateral cams 27 carried by gear 26 operate the rearwardly extending arms 33 of the knives 21, a weight 29 normally holding such rear ends 33 together. A cam 30 carried by gear 26, by means of rod 31 and lever 32 reciprocates the tool spindle 15.

In operation, assume that the stock has dropped and has been gripped by the chuck mechanism within the spindle. The work is being rotated in one direction, while the tool is being rotated in an opposite direction, and at the same time moved upwardly. It thus drills a certain predetermined distance into the end of the stock whereupon it is automatically retracted. When the drill is sufficiently withdrawn, the rear ends of the knives are automatically forced apart thus actuating the knives to cut the stock and the cut-off portion will obviously constitute a nut which falls into a suitable receptacle. As soon as the cutting operation is complete, the knives are automatically withdrawn and at the same time the chuck mechanism allows the stock bar to drop down through the work spindle. This downward drop is limited, however, by the stop which may be adjusted to allow any length of stock to project from the spindle. The cycle of operation is then complete and the drill begins its work again.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims, or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. In a machine of the class described, the combination of a stock-holding spindle, a rotatable tool alined with said spindle, and a tool-guide comprising two members spaced from each other and recessed at their adjacent ends.

2. In a machine of the class described, the combination of a stock-holding spindle, a rotatable tool alined with said spindle, a tool-guide comprising two members spaced from each other and recessed at their adjacent ends, and a gage disposed between said guide and spindle and outside of the reciprocatory path of said tool.

3. In a machine of the class described, the combination of a stock-holding spindle disposed so that the stock may be fed therethrough by gravity, a rotatable tool alined with said spindle and reciprocable toward and from the spindle, a guide for said tool, means for intermittently gripping the stock in said spindle, and a gage for gaging the length of stock fed through said spindle, said gage being disposed between said guide and spindle and outside of the reciprocatory path of said tool.

4. In a machine of the class described, the combination of a stock-holding spindle, a rotatable tool reciprocable toward and from said spindle, a guide for said tool, and a gage disposed between said guide and spindle and outside of the reciprocatory path of said tool.

5. In a machine of the class described, the combination of a stock-holding spindle, a rotatable tool reciprocable toward and from said spindle, a guide for said tool, and a gage disposed between said guide and spindle and outside of the reciprocatory path of said tool, said gage being adjustable toward and from said spindle.

6. In a machine of the class described, the combination of a stock-holding spindle, a rotatable tool reciprocable toward and from said spindle, a guide for said tool, a screw, and a gage threaded on said screw between said guide and said spindle and outside of the reciprocatory path of said tool.

Signed by me this 29th day of August, 1910.

FRANK E. BRIGHTMAN.

Attested by—
GEO. M. ZIMMERMAN,
WM. F. SENN.