H. C. Bradford,

Eyelet Machine.

No. 92,254. Patented July 6. 1869.

Fig 1.

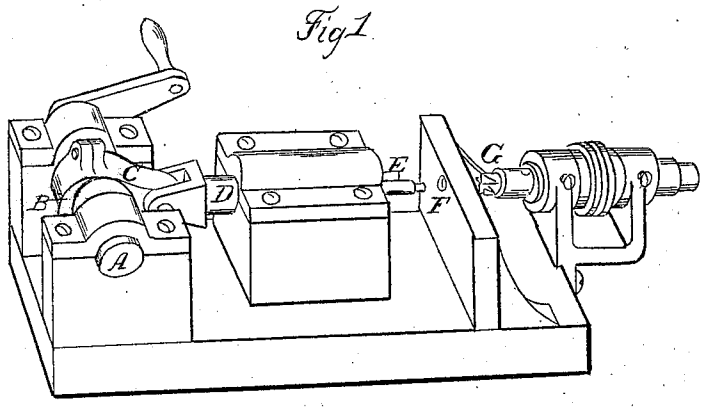


Fig 2.

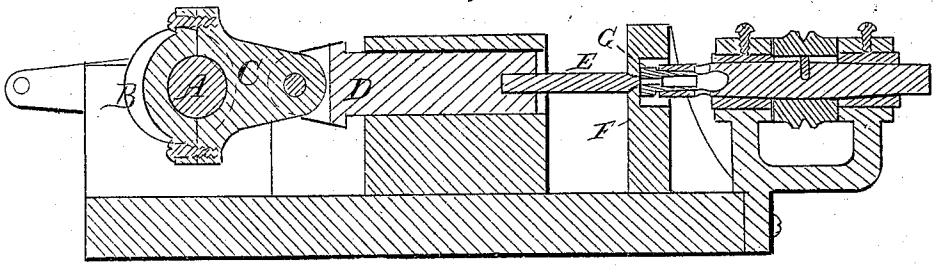


Fig. 3.

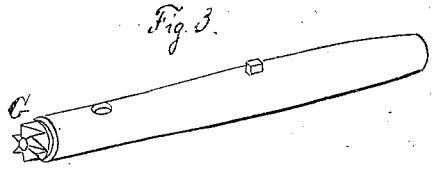
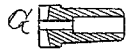


Fig. 4.



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United States Patent Office.

HORACE C. BRADFORD, OF PROVIDENCE, RHODE ISLAND.*

Letters Patent No. 92,254, *dated July* 6, 1869.

IMPROVEMENT IN EYELET-MAKING MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, HORACE C. BRADFORD, of the city and county of Providence, and State of Rhode Island, have invented a certain new and useful Improvement in Machines for Making Metallic Eyelets; and I do hereby declare that the following specification, taken in connection with the drawings furnished, and forming a part of the same, is a true, clear, and exact description thereof.

My invention consists in the use of a revolving milling-tool or cutter, so arranged, in relation to the cutting and forming die, that as the eyelet-cup is formed therein, its end is cut away by the milling-tool, thus perfecting the eyelet at a single operation of the machine.

Reference being had to the drawings herewith—

Figure 1 represents, in perspective, the main features of a horizontal-acting eyelet-machine, with my improvements attached.

A is the driving-shaft.

B is an eccentric on shaft A.

C is an eccentric-rod.

D is a reciprocating slide, attached to and operated by the eccentric-rod C.

E is a male die or punch, for forming the eyelet-cup, and is attached to the slide D in an obvious manner.

F is the female die, formed to suit requirements, (as regards size and shape of the eyelet desired,) and to which the male die E is accurately adjusted.

The rear of this die F is recessed, which, with the front portion, forms an opening through the die-plate, so that when the eyelet-cup is formed, and still remains on the end of the male die E, it shall protrude into the recess, a distance equal to and by preference slightly greater than the thickness of the eyelet-metal at the round end of the cup.

G is the milling-tool or cutter, which involves the main feature of my invention.

It is connected with an arbor, operating at right angles with the driving-shaft A, and from which it may receive motion, by any of the well-known modes of communication.

It is to be remembered in this connection, that the die for cutting the blanks or disks from sheet-metal, with the necessary feeding-device, is not shown, nor is the mechanism for clearing the eyelets from the male die, as neither of these relates to my present invention.

Figure 2 represents the same as in fig. 1, in vertical longitudinal section, and exhibits all the parts in their relative positions. Said parts are lettered as in fig. 1.

Figure 3 represents the face of the cutter or milling-tool G.

Figure 4 represents the cutter G in section, and exhibits its internal structure.

It will be seen that its centre is drilled out from the cutting-end inward. The aperture is of a regular and even diameter for a short distance, and then enlarges on a taper to the rear.

The purpose of this aperture is to receive the circular tops of the eyelet-cups removed by the cutter. It has a regular diameter for a short distance, in order to admit of the sharpening of the cutting-edges of the milling-tool, as they might wear from time to time, and thus require it.

The gradual enlargement or tapering of the aperture, effectually prevents the cuttings from getting clogged therein, and facilitates a free discharge of the same through the opening provided therefor in the arbor.

The operation of my improvement is as follows:

The dies having been accurately adjusted, the cutter G is advanced into the recess at the rear of the die F, until at a point distant from the rounded shoulder in said die, equal to the length of the eyelet desired.

As the die or punch E advances with an eyelet-cup, just formed, or being formed, it presses the round end thereof into the cutting-aperture of the revolving tool G, which cleanly and instantaneously removes the end, thus finishing the eyelet by the time the die E next recedes, the same operation being repeated at every revolution of the machine.

The round ends of eyelet-cups have heretofore been removed, either by the use of dies provided with cutting-shoulders or by grinding, the latter operation being done in a separate machine, by means of a grinding-wheel and an endless belt, with perforations for receiving and holding the eyelet-cups during the process of grinding.

The use of dies with the cutting-shoulders is open to many objections, the principal of which is the necessity of using a very soft, fine, and expensive metal, which will stand the various cuttings without fracture, and yet be ductile in the finished eyelet. Should a cheaper metal be used, the operation of annealing becomes necessary during the process of manufacture.

By the addition of my improvement to any of the machines now in use, it becomes practicable to finish an eyelet at a single operation of the machine, without destroying the ductility of the metal, and securing a degree of uniformity and finish seldom if ever heretofore accomplished.

It will be readily obvious that my improvement may be attached to a vertically-operating machine, as well as to that in connection with which it is herein described and shown.

Having thus described my invention,

I claim as new, and desire to secure by Letters Patent of the United States—

1. The combination of the dies E and F, or their equivalents, with the revolving cutter G, or its equivalent, arranged relatively to each other, substantially as herein described, for the purposes specified.

2. The revolving cutter G, with its open centre constructed to operate substantially as described, for the purposes specified.

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Witnesses:

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* Assignor to himself & H. N. Tenner of the same place.