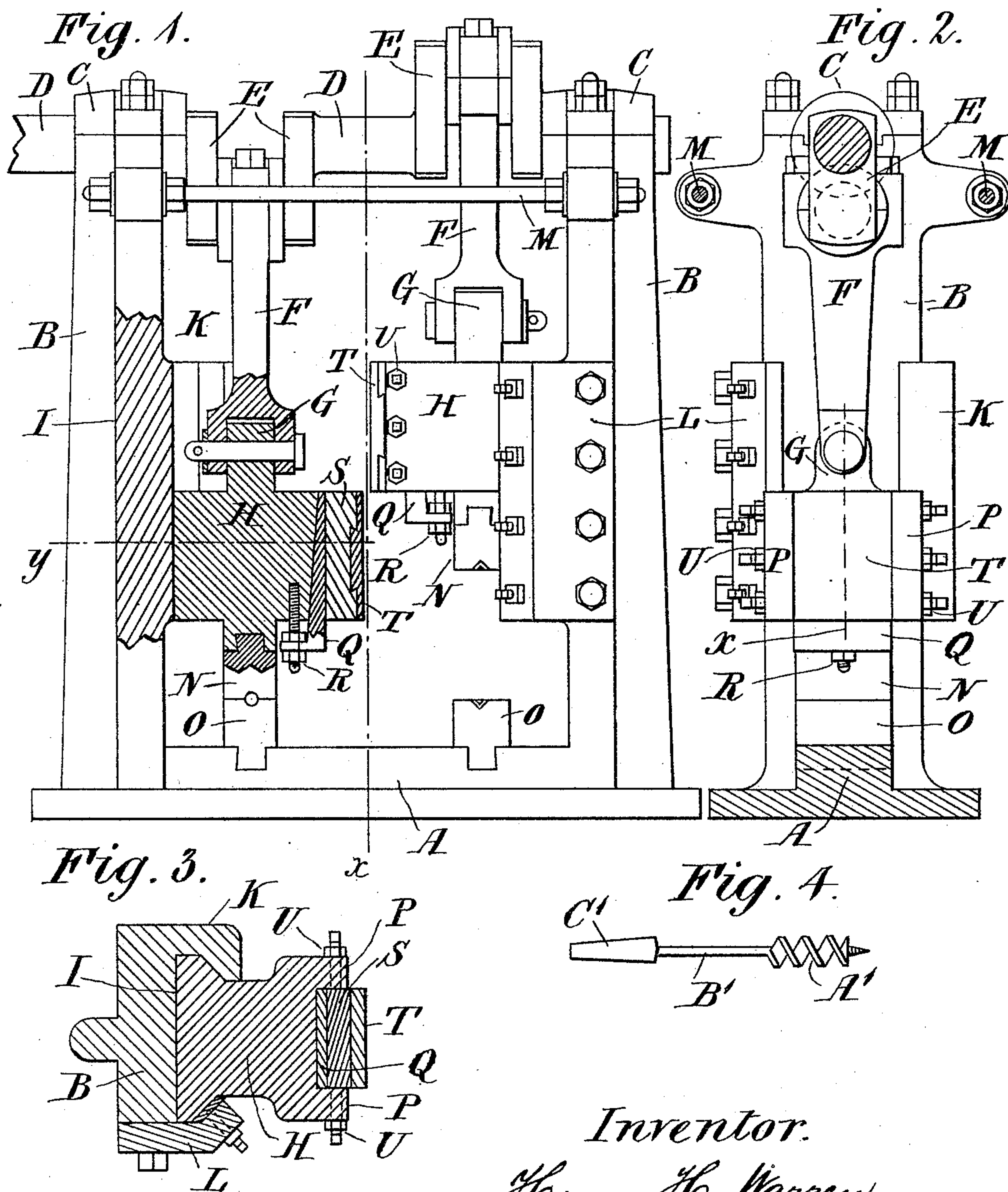


(No Model.)

H. H. WARREN.
APPARATUS FOR SWAGING AND ROLLING.

No. 411,480.

Patented Sept. 24, 1889.



Witnesses.
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APPARATUS FOR SWAGING AND ROLLING.

SPECIFICATION forming part of Letters Patent No. 411,480, dated September 24, 1889.

Application filed October 26, 1888. Serial No. 289,236. (No model.)

To all whom it may concern:

Be it known that I, HENRY HARRISON WARREN, a citizen of the United States of America, residing at Massena, in the county of St. Lawrence, State of New York, United States of America, have invented new and useful Improvements in Apparatus for Swaging and Rolling; and I do hereby declare that the following is a full, clear, and exact description
10 of the same.

This invention relates to improvements in apparatus for swaging and rolling, and has for its object the formation of them in such a manner that they may be used not only to
15 operate swaging-dies placed under or attached to their slide-blocks in the ordinary manner, but also have rolling-dies attached to and operated by their slide-blocks, so that the power-press will be enabled to simultaneously
20 swage and die-roll articles that it is suitable to manufacture.

The rolling-dies which my present invention is arranged to operate may be of many forms; but I have adapted it more particularly for that described in United States Letters Patent granted to Andrew Laundry and myself on the 15th of May, A. D. 1888, No. 382,710.

By the use of my present invention much
30 reheating of the metal-blank and handling of the article while being manufactured out of a blank are saved. Consequently they are made with less time and expense.

My invention is applicable to power-presses
35 having one or two slide-blocks. I shall illustrate it with a power-press having two slide-blocks H.

In the drawings hereunto annexed similar letters of reference indicate like parts.

40 Figure 1 is a front elevation of an apparatus embodying my invention, part in section, the sectional part being taken at or about line *x*, Fig. 2. Fig. 2 is a section on line *x*, Fig. 1, and an end elevation of the left-hand half of the power-press shown in Fig. 1. Fig. 3 is a horizontal section taken at or about line *y*, Fig. 1. Fig. 4 is an elevation of an ordinary auger.

A is the base of the apparatus, which may

be situated and attached on any suitable
50 horizontal bed or platform.

B are two uprights made integral with the bed A. These are provided with bearings C, carrying a crank-shaft D, provided with two
55 cranks E, set at opposite points in the circle of their revolutions, so that when one of the cranks is at the highest point the other will be at the lowest point in the circles of their revolutions.

F are connecting-rods. The upper ends of
60 these are connected with the cranks in an ordinary manner, while the lower ends of the connecting-rods are connected with eyes G of slide-blocks H, guided by the inner surfaces I of the uprights B, and by a guide-bar K,
65 preferably made integral with the upright B, and by a guide-bar L, preferably attached to the upright B.

M are stays to prevent the uprights B springing
70 apart.

To the bottom sides of the slide-blocks H, or to any desired projection thereof, as shown, are attached the upper halves N of any desired swages or dies, while the lower halves O are attached in an ordinary manner to the
75 bed A.

Although but one set of swages or dies are shown under each slide H, yet as many may be arranged in a similar manner to that shown and described as there is room for, if
80 such are desired.

The slides H are each provided with jaws P, between which is placed a wedge Q, held in place and adjusted by a stud and nuts R.

S is a block which is placed between the
85 jaws P and secured by pinching-screws and jam-nuts U. To the blocks S are attached by dovetails, as shown, or in any other desired manner, any desired die T for rolling metal articles.

The advantage of having the blocks S with the dies T attached thereto is, that by having a number of blocks S of various thicknesses the distance between the two dies T may be adjusted approximately to what is
95 required, while the wedge or wedges Q enable the adjustment to be made with very great exactness.

To describe the manner of operating with this apparatus and to show the advantages of it, I will suppose it to be provided with dies T similar to those for which said Letters Patent of the United States No. 382,710 were granted for making the twisted part A' of the auger, (see Fig. 4,) and that the swages N O are suitable for forming the round part B' and tapered end C'. After the press is put in motion, a suitable blank piece of metal having been heated, it may be swaged with the swages or dies N O and the twisted part A' rolled by the dies T without as much loss of time and heat as would be the case if the dies and swages were placed in separate machines.

It is evident from the construction of the apparatus that an operator can stand on each side of it, and while the one is causing the swages or dies N O to act upon one blank of heated metal the other operator can be caus-

ing the dies T to operate upon another blank of heated metal, and thus by keeping proper time with the movements of the press a double amount of work may be obtained from it in a given time.

What I claim is as follows:

The combination, in a simultaneously swaging and rolling apparatus, of the cranks E and connecting-rods F, and slide-blocks H, arranged to reciprocate and move in opposite directions by said cranks and connecting-rods, each slide-block H having a rolling-die T and the half of a pair of swaging-dies N, with bed A, having the other half O of the swaging-dies, the whole constructed, arranged, and operating substantially as described.

HENRY H. WARREN.

Witnesses:

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