

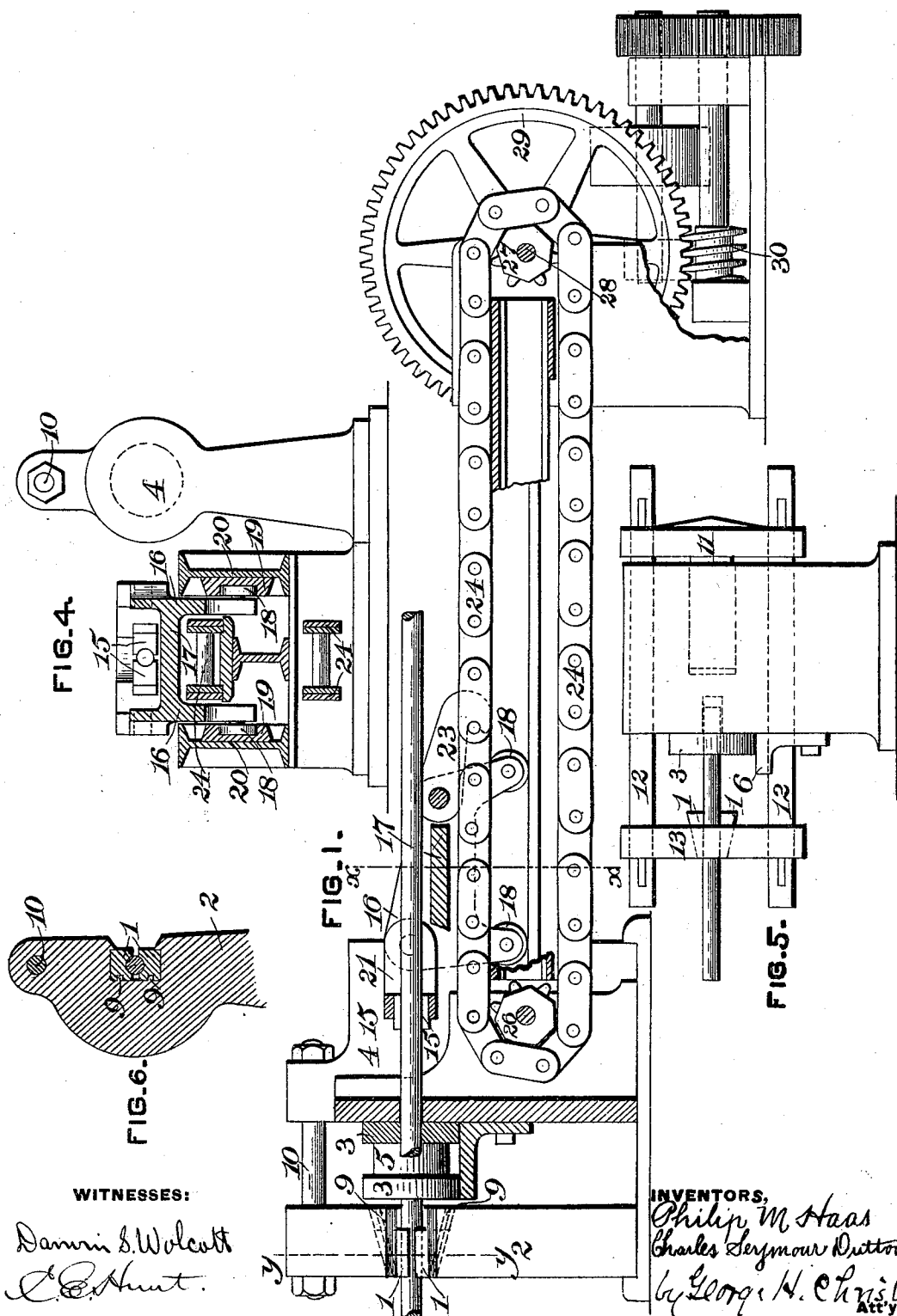
(No Model.)

2 Sheets—Sheet 1.

P. M. HAAS & C. S. DUTTON.
MACHINE FOR DRAWING BARS OR RODS.

No. 520,592.

Patented May 29, 1894.



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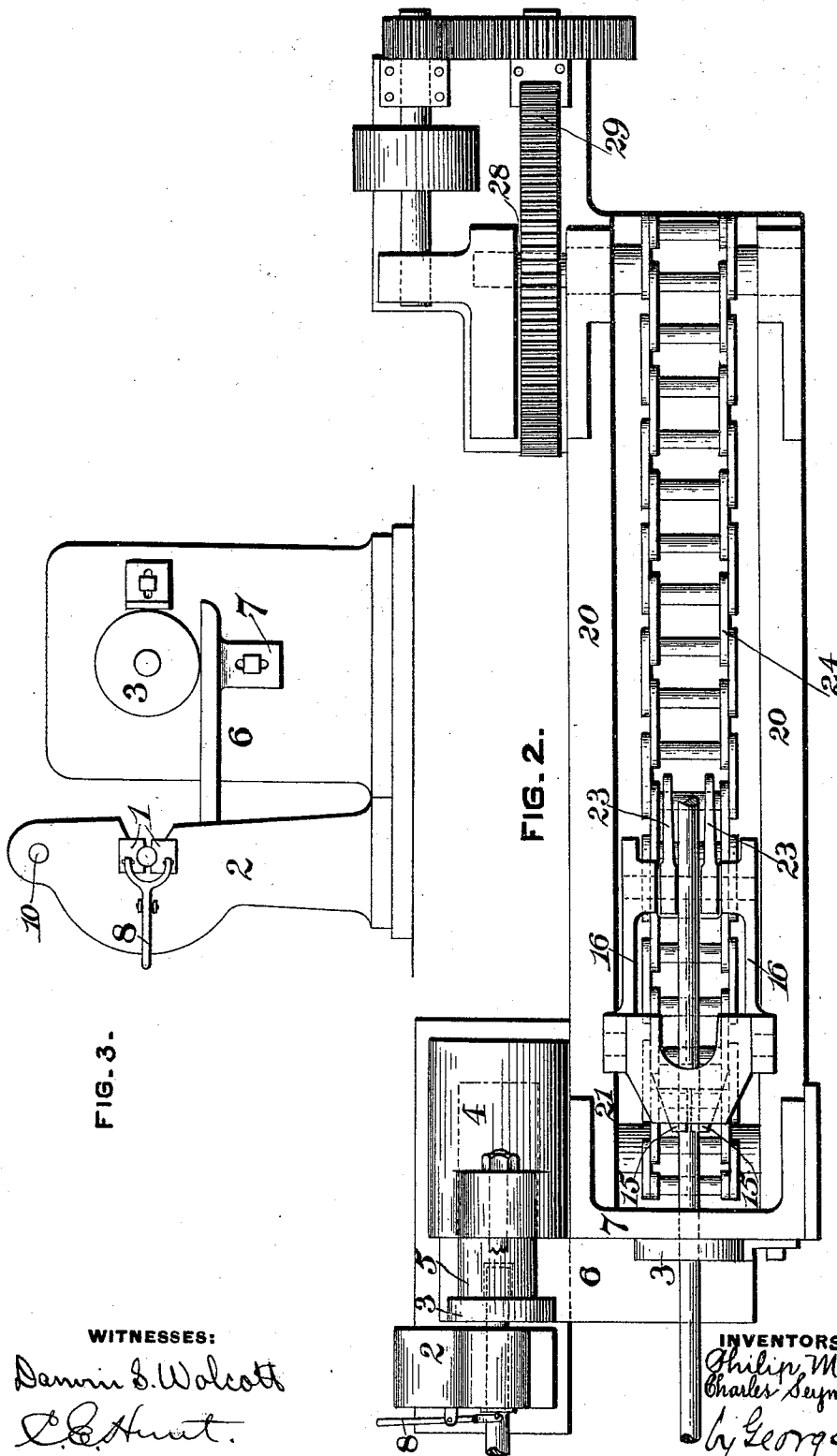


FIG. 3.

FIG. 2.

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UNITED STATES PATENT OFFICE.

PHILIP M. HAAS AND CHARLES SEYMOUR DUTTON, OF YOUNGSTOWN,
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MACHINE FOR DRAWING BARS OR RODS.

SPECIFICATION forming part of Letters Patent No. 520,592, dated May 29, 1894.

Application filed July 19, 1893. Serial No. 480,873. (No model.)

To all whom it may concern:

Be it known that we, PHILIP M. HAAS and CHARLES SEYMOUR DUTTON, citizens of the United States, residing at Youngstown, in the county of Mahoning and State of Ohio, have invented or discovered certain new and useful Improvements in Drawing-Machines, of which improvements the following is a specification.

The invention described herein relates to certain improvements in mechanism for drawing metal bars or rods, and has for its object such a construction and arrangement of mechanisms for forcing the die over the end of a bar or rod and for pulling the rod or bar through the die, the mechanisms being so arranged that both operations may proceed simultaneously on different bars or rods, and that a bar or rod with the die applied may be readily transferred from the forcing to the pulling mechanism.

In general terms, the invention consists in the construction and combination substantially as hereinafter more fully described and claimed.

In the accompanying drawings forming a part of this specification, Figure 1 is a view partly in section and partly in elevation, of a drawing mechanism embodying our invention. Fig. 2 is a top plan view of the same. Fig. 3 is an end elevation. Fig. 4 is a transverse section, the plane of section being indicated by the line *x, x*, Fig. 1. Fig. 5 is an elevation illustrating a modification of the mechanism for applying the dies in the end of the bar, and Fig. 6 is a sectional elevation, the plane of section being indicated by the line *y, y*, Fig. 1.

In the practice of our invention, one of a series of two or more dies of each size of rod or bar to be drawn, is forced over the end of a bar or rod without any previous reduction of such end, sufficiently far to permit of the grippers of the pulling mechanism, to take a firm grip upon the protruding end. The die forcing mechanism, which is preferably of the construction hereinafter fully set forth, is located in such proximity to the pulling mechanism that the bar or rod with the die applied thereto may be quickly and easily transferred

thereto. While the bar is being drawn through the first die, by the pulling mechanism, another die is being applied to another rod or bar by the forcing mechanism. As both operations are carried on simultaneously a considerable saving of time is effected.

The bar to be drawn is so placed within the grippers 1, suitably arranged within the standard 2, that when said grippers shall have taken a firm grip upon the bar, a sufficient portion thereof will project beyond the standard 2, to permit of the die 3 being forced a suitable distance upon the bar, *i. e.* ten or twelve inches, more or less, to permit the grippers of the pulling mechanism to take a firm grip on the projecting end of the bar, as hereinafter described. In line with the standard 2 is placed another standard 4, provided with a fluid pressure cylinder firmly attached thereto, or preferably formed therein, as shown in Fig. 2. As soon as the grippers 1 have taken a firm hold upon the bar, the drawing die 3 is interposed between the projecting end of the bar, and the piston 5 of the fluid pressure cylinder which is then forced out by the admission of fluid pressure. The outward movement of the piston 5 presses the die 3 over the end of the bar, and the end of the bar passes into a recess formed in the piston 5, as indicated by dotted lines in Fig. 2. In order to support the die 3 in proper alignment with the bar prior to its being pressed upon the same, an adjustable shelf 6 is arranged along the front of the standard 4, and is extended along the front face of the front abutment 7 of the pulling machine proper, the press or forcing mechanism just described being preferably arranged alongside of the drawing mechanism so as to permit of the lateral movement of the bar with the die from the press mechanism to the drawing mechanism, as shown in Fig. 2. In order to permit of the lateral movement of the bar with its die, the standard 2 is laterally slotted, as shown in Fig. 3, and the grippers 1 are so arranged in their seats in the standard 2 that when actuated by the lever 8, to the right in Fig. 2, the grippers will move apart and permit the bar to pass out from between them. This lateral movement of the grippers 1 is

effected by means of inclined ribs 9, formed on the standards 2, and engaging grooves in the sides of the grippers. The standards 2 and 4 are preferably held in proper relation to each other by means of a tie bar 10, as shown in Fig. 1.

In lieu of the construction heretofore described for applying the die 3 to the bar, the construction shown in Fig. 5 may be employed. In this construction the fluid pressure cylinder is formed in the rear side of the standard 4, and the piston 5 is provided with a cross-head 11, to which are secured rods 12, extending through the standard 4, which serves as a guide for the said rods, and are connected at their opposite ends to a cross-head 13, in which are mounted the grippers 1. In this construction, the bar to be drawn is pulled into the die 3, which rests against the standard 4, being supported in proper relation to the bar by the shelf 6. A suitable opening is formed in the standard 4, for the reception of the projecting end of the bar as it is forced through the die.

After the die has been forced upon the bar as described, the grippers 1 are opened, and the bar is shifted by a rolling motion, the drawing die being circular, until the bar is in line with the opening in the standard or abutment 7, when the bar is moved longitudinally until the die rests against said standard or abutment, and the projecting end of the bar passes through the opening in the standard 7. It is preferred to provide a stop on the standard 7, so as to arrest the movement of the bar and the die 3 when the former is in line with the opening in the standard. The grippers 15 are then applied to the protruding end of the bar, and the latter is drawn through the die 3, by means of the pulling truck, which is connected to an endless chain.

As soon as the bar or rod with the die applied thereto has been shifted to the pulling or drawing mechanism, another bar or rod is placed in position in the grippers 1 and a second die forced over the end thereof in the manner described. This pulling truck consists of side frames 16, united by a web 17, the side pieces and web being preferably formed integral with each other, as shown in Fig. 4. As shown in Figs. 1 and 4, the side pieces are provided at their lower corners with wheels or disks 18, mounted on suitable journals extending from the side pieces, and arranged to move along in ways formed by the channel bars 19, which are secured to I-beams 20, forming the sides of the drawing frame. The grippers 15 are arranged in a swinging frame 21, which is provided with journals 22, mounted in bearings formed in the side bars of the pulling truck, in line with the journals of the rear wheels or disks 18. At its front end the pulling truck is provided with hooks 23, arranged near the sides of the truck, and adapted to engage the cross-bars of the endless chain 24. This chain is arranged to pass

around sprocket wheels 26 and 27, arranged at the ends of the frame of the machine. The sprocket wheel 27 is arranged upon a shaft 28, on which is also mounted a worm wheel 29, intermeshing with a worm 30, formed on the power shaft of the machine. As soon as the bar and die 3 have been arranged as described, with the end of the bar protruding through the front standard or abutment 7, the pulling truck is run to the front end of the machine, and the grippers 15 are applied to such protruding ends. The hooks 23 are then swung down so as to engage one of the cross-bars of the endless chain 24, whereby the truck is pulled to the rear of the machine. As soon as the truck has reached the rear limit of its movement, the hooks are released and the pulling truck run to the front of the machine again, so as to take a new grip upon the bar.

It will be observed by reference to Fig. 2, that the grippers 15 have inclined outer faces and are arranged within a slot in the swinging frame 21, having inclined walls, so that when the truck is being moved by the chain toward the rear of the machine, the inclined walls of the grippers and the swinging frame will cause the grippers to take a firm, tight grip upon the bar. But when the truck is shifted toward the front of the machine, the grippers will be loosened from their hold, and can slide freely over the bar. By reference to Fig. 2, it will be seen that the hooks 23, are arranged on opposite sides of the bar, so that the latter will not, when, by the continued operation of the machine, it extends beyond the hooks, interfere with their vertical movement in being released from and connected to the chain.

As will be readily understood by those skilled in the art, the pull of the chain will tend to raise the front end of the truck, and correspondingly shift the upper rear corner of the same, to which the gripping mechanism is attached. If the gripping mechanism were rigidly connected to the pulling truck, this tipping of the latter would tend to produce a kink in the bar. But, by pivoting the swinging frame to the truck, and arranging the pivotal point of the frame in line with the center of the tipping movement of the truck, i. e. the wheel or disk at the lower rear corner of the truck, no movement will be imparted to the swinging frame by this tipping of the truck.

The gripping dies 1, are formed with two opposite sides inclined, as shown in Fig. 1, and two sides of their seat in the standard 2, are similarly inclined, so that the grippers will take a firm hold upon the bar, as the piston 5 is pushing the die through upon the end of the bar. The grippers 1 are similarly secured in the cross-head 13, in the modification shown in Fig. 5.

It is characteristic of our improved machine that no change in adjustment of any of the parts is necessary in drawing different sizes

of rods or bars, only the drawing dies need be changed. Hence, it is possible that different sizes of rods may be alternately fed to the machine without any delay in the operation thereof.

While we have described and shown with some degree of particularity a form of mechanism for drawing rods, no claim is made herein to such drawing mechanism, as the same forms the subject matter of an application to be filed in due time. It will be understood that while it is preferred to employ the construction of drawing mechanism shown and described, any other suitable drawing mechanism may be employed in connection and in combination with the mechanism for forcing the die onto the end of the rod.

We claim herein as our invention—

1. A machine for drawing bars, rods, &c., comprising mechanism for forcing a die over the end of a bar or rod sufficiently to permit of the application of a gripping mechanism to the protruding end of the bar or rod, and mechanism for pulling the bar or rod through the die, the forcing and pulling mechanism being arranged in suitable relation to each other with reference to the simultaneous operation of both mechanisms simultaneously on different rods and also for the convenient and ready transfer of a bar or rod with a die forced over its end from the forcing to the pulling mechanism, substantially as set forth.

2. In a machine for drawing bars and rods, the combination of a laterally slotted standard, grippers arranged in said standard for rigidly clamping and holding the bar or rod, a support for holding the die in line with the rod or bar when held by the grippers and

mechanism for forcing the die onto the bar or rod, substantially as set forth.

3. A machine for drawing rods, bars, &c., comprising a laterally slotted standard, grippers arranged in said standard, mechanism for forcing a die onto a rod or bar while held by the grippers, drawing mechanism, and a support for the die and bar extending from the forcing to the drawing mechanism, substantially as set forth.

4. In a machine for drawing rods, bars, &c., the combination of grippers for rigidly clamping and holding the bar or rod and a fluid pressure cylinder and piston arranged to force the drawing die over the end of the bar to be drawn, substantially as set forth.

5. In a machine for drawing bars, rods, &c., the combination of stationary grippers and a fluid pressure cylinder and piston arranged to force the drawing die over the end of the bar to be drawn, the piston being provided with an opening for the reception of the end of the bar, substantially as set forth.

6. A machine for drawing bars, rods, &c., comprising a laterally slotted standard, grippers arranged in said standard, a fluid pressure cylinder and piston, drawing mechanism, and a support for the die and bar, extending from the pressing mechanism to the drawing mechanism, substantially as set forth.

In testimony whereof we have hereunto set our hands.

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Witnesses:

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