(No Model.)

P. M. HAAS.

METAL DRAWING DOG.

No. 293,166. Patented Feb. 5, 1884.

Fig. 1.

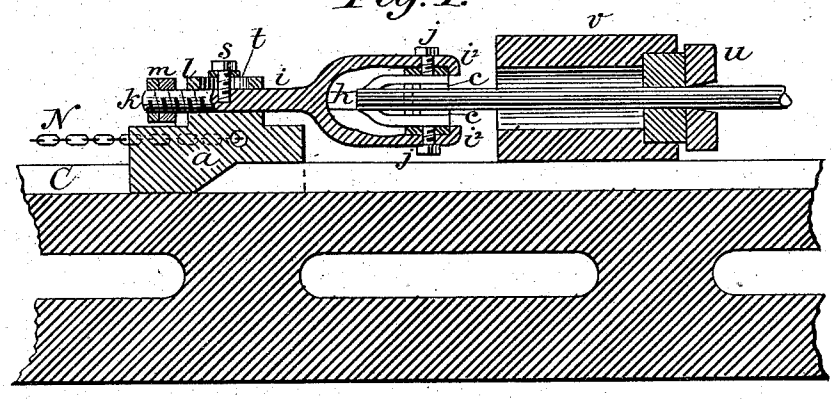


Fig. 2.

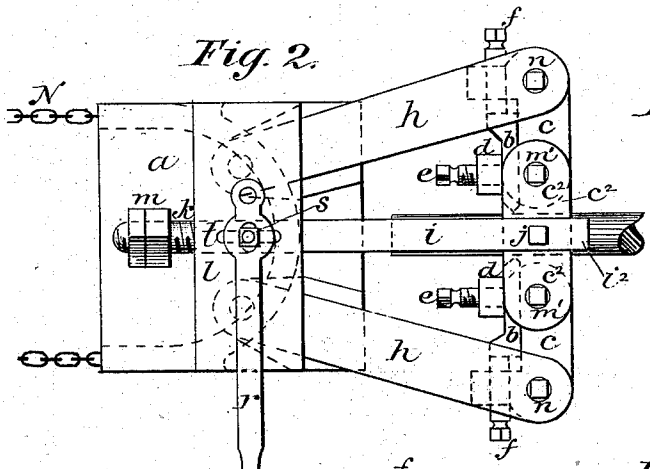


Fig. 4.

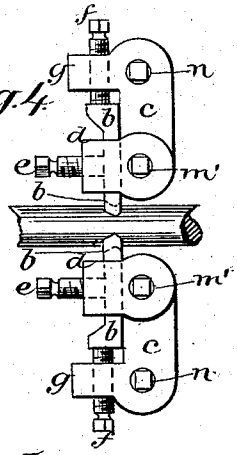


Fig. 3.

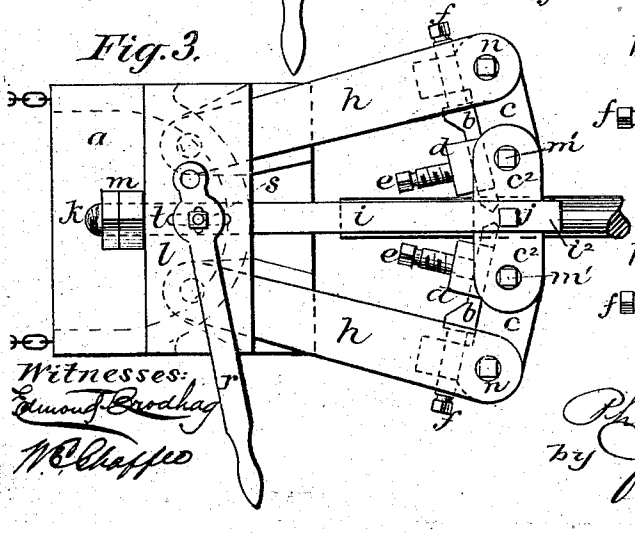


Fig. 5.

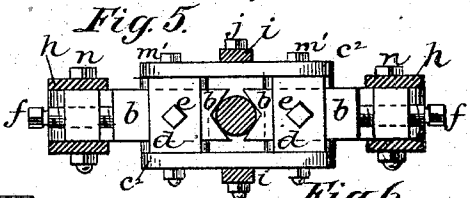
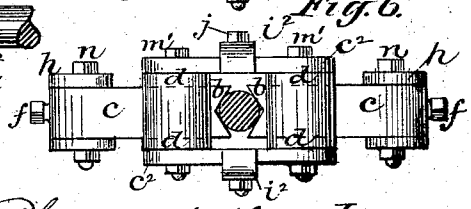


Fig. 6.



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UNITED STATES PATENT OFFICE.

PHILIP M. HAAS, OF YOUNGSTOWN, OHIO, ASSIGNOR OF ONE-HALF TO ANDREWS, BROS. & CO., OF SAME PLACE.

METAL-DRAWING DOG.

SPECIFICATION forming part of Letters Patent No. 293,166, dated February 5, 1884.

Application filed April 20, 1883. (No model.)

To all whom it may concern:

Be it known that I, PHILIP MELANCTHON HAAS, a citizen of the United States, residing at Youngstown, in the county of Mahoning and State of Ohio, have invented new and useful Improvements in Metal-Drawing Dogs, of which the following is a specification.

My invention is directed to the production of a dog or grasping device particularly adapted for use in machines for drawing metal bars, shafts, or wire through a die for reducing, straightening, and polishing such articles.

The object of my improvement is to construct such a grasping device with dogs adapted to tighten their hold upon the article by reason of being coupled together at their gripping ends in such manner that they will be supported by such coupling, to cause them to bite with a force upon the article increasing in proportion to the resistance upon the article being drawn. The dogs are coupled together across the line of their gripping ends and at right angles to the line of draft, and they operate in the arcs of circles, their outer ends being coupled to a sliding draw-head, which also has an adjustable connection in the line of draft with the couplings of the gripping ends of the dogs, in such manner as to form a stop to limit the deflection of the dogs in their biting action from a right line, whereby I am enabled to use dogs having biting ends of single points and control the extent to which said dogs may bite into the article being drawn through the die. The construction by which this is effected gives a firm and safe grip upon the article and avoids the necessity of preparing the end of the article to receive and form a hold for the dog.

The draw-head may be adapted for use in any metal-drawing machine, and I have therefore only shown in the drawings the grasping device in connection with a sliding draw-head and a portion of a bar representing the article grasped and being drawn through a gaging-die.

To more particularly describe my said invention, I will refer to the accompanying drawings, and specifically point out the parts and combinations which I claim as new.

In these drawings, Figure 1 represents a vertical section taken through the central adjustable connection of the grasping device, showing the bar in gaging-die. Fig. 2 represents a top view of the grasping device, the dogs being in the position they occupy when adjusted to receive the article to be gripped. Fig. 3 represents a similar view, showing the position of the dogs when gripped upon the article to the full extent to which their edges are permitted to bite into the article to give the required hold. Fig. 4 represents a top view of the dogs and their holders in their relative positions when out of action, detached from their coupling-connections. Fig. 5 is a view looking toward the inner side of the dogs and their holders. Fig. 6 is a front view of the dogs and their coupling-connections.

The draw-head *a* may be of any suitable construction to adapt it for use in any particular metal-drawing machine and for any particular means for operating it. The grasping device is pivoted to and projects from one end of the draw-head in position to receive the article centrally with the line of draft. It consists, essentially, of two dogs, *b b*, arranged at right angles to the line of draft, fastened to holders *c c*, coupled at their inner ends by plates c^2 c^2, crossing the line of draft, and pivoted to said dog-holders *c* on their upper and on their lower sides, between which coupling-plates the article passes in position to be gripped by the dogs. The dogs are confined to their pivoted holders by straps *d d*, which form keepers, within which, when set, they are clamped by screws *e e*, while a set-screw, *f*, tapped into a right-angled projection, *g*, on the outer end of the dog-holder *c*, abuts against the outer end of the dog, so as to set it out from the holder to suit the size of the bar and support the dog under the gripping action. The dog-holders, being pivoted at their ends near to the gripping-points, are also pivoted at their outer ends to coupling-arms *h*, which are also pivoted to the draw-head. The dog-holders *c* therefore are free to turn at either end upon their couplings. Now, the dog-holders being thus coupled, and the article to be gripped being placed between them, the dogs are brought against it by slight-

ly moving their inner coupled ends outward or away from the draw-head. This movement of the dogs may be effected by any suitable means, as it is only intended to set the dogs upon the article at the beginning of the operation of the drawing. I do this, however, by a device which also serves the purpose of limiting the extent to which the dogs are allowed to bite into the article. This device consists of a yoke, *i*, which is divided or forked, so as to lap over the upper and under the lower coupling-plates, c^2, and over their outer edges by lapping lips i^2, and is secured to said coupling-plates by cap-screws *j* in the line of draft, whereby the said yoke and coupling-plates are rigidly connected. This coupling-yoke terminates in a screw-shank, *k*, which passes through an opening in a boss or projection, *l*, on the top of the draw-head, and is provided with jam-nuts *m*, which, when set, limit the outward movement of the yoke by coming against the draw-head projection *l*, as shown in Fig. 3, so that the jam-nuts *m* form a stop, against which the draw-head *a* pulls, and by which the dogs *b* are stopped from biting beyond a sufficient hold into the article. The arms *h h* are forked or slotted to receive the outer ends of the dog-carriers *c c*, and they are pivoted so as to have a certain play within the draw-head, as shown in Fig. 2. The inner ends of the dog-holders *c* are pivoted to the coupling-plates c^2 and to the dog-keepers by pivots *m'*, while the pivots *n* connect the dog-holders with the coupling-arms *h*. The dogs *b* are set upon the bar in commencing the operation by means of a lever, *r*, pivoted to the projection *l* of the draw-head, and connected to the yoke *i* by a pin or screw, *s*, passing through a slot, *t*, in the draw-head. The lever stands at right angles to the line of draft, and by moving it toward the grasping device the yoke *i* will be moved out from the draw-head, carrying with it the coupling-plates c^2 and the biting ends of the dogs, which will thereby be drawn together upon the bar and grip it. The bar, however, is previously put through a gaging-die, *u*, and through a fixed abutment, *v*, against which the die is supported, so that the end of the bar projects sufficiently beyond the abutment to be grasped by the drawing device. Power being applied to the draw-head, the coupling-arms *h* draw upon the outer ends of the dog-holders, and thus increase the biting action of the dogs upon the bar, because, the dog being arranged upon the inner sides of their holders, the latter will flex on the pivots *m' n* in such manner as to cause the dogs to approach the bar. They are, however, only permitted to have a limited movement toward the bar, and hence to bite into it only to a certain extent. This is effected by limiting the outward movement of the yoke by means of the jam-nuts *m* coming against the draw-head and forming a stop, against which the yoke pulls to hold the dogs firm, while the force of the draft is exerted upon the rod in the line of the dogs by the coupling-arms *h*. In this action it is important to notice that the pivots *m' n* of the dog-holders stand in line at right angles to the line of draft, and that the biting-points are between such line of the pivots and the draw-head, and that in increasing the force of the dog-holders they describe an arc concentric with the pivots *m* of the coupling-plates.

Any suitable mechanism may be employed for operating the drawing-abutment. That shown consists of a chain, N, preferably passed through a semicircular way in the draw-head and connected to a drum or drums suitably supported at the end of the bed or frame upon which the draw-head slides. As shown, the draw-head is adapted to slide upon a trough-shaped bedway, C, to which it is connected by side grooves or in any suitable way.

In another application I have shown this draw-head in a metal-drawing machine having appliances for both drawing and pushing metal bars or shafts, in connection with fixed abutments and a removable gaging-die, in which the latter is first placed upon the bar, which is then drawn through said die, and it is particularly to such machine that my improved drawing-dog is applicable. This patent, however, is only intended to cover the improvement in the drawing device, which may be used in any suitable metal-drawing machine.

I claim—

1. The combination, with a suitable drawing-die, of grasping-dogs, suitable holders therefor, pivoted couplings for the inner ends of said holders, and pivoted operating-connections for their outer ends, connected to the draw-head, whereby the dogs are adapted to operate upon the article being drawn by a compound movement of their biting-points toward each other at right angles to the line of draft, and by a deflection from a right line in their biting action in a direction opposite to that of the draft, substantially as described, for the purpose specified.

2. In a metal-drawing machine, the grasping and drawing device, consisting of the dogs *b b*, their pivoted holders *c c*, their coupling-plates c^2, their coupling-arms *h*, the yoke *i*, provided with the nuts *m*, the draw-head *a*, and the screws *e f*, for adjusting and supporting the dogs, substantially as described.

3. The combination, with a suitable drawing-die, of the dogs *b b*, their holders *c c*, the coupling-plates c^2, to which said holders are pivoted across the line of draft, the pivoted coupling-arms *h h*, the draw-head, and means, substantially such as described, connected with the draw-head and with the coupling-plates, whereby the biting action of the dogs into the article being drawn is automatically limited.

4. The combination, in a metal-drawing machine, a suitable drawing-die, the draw-head *a*, the dogs *b b*, their pivoted holders *d d c c*, the coupling-plates c^2 c^2, the coupling-arms *h*

h, the adjustable yoke *i*, and the lever *r*, connected therewith and with the draw-head, substantially as described, for the purpose specified.

5. The dogs *b b*, their holders, and suitable pivoted coupling-connections for their inner ends, in combination with suitable operating-connections pivoted to the outer ends of said dog-holders, and a suitable draw-head, to which said operating-connections are also pivoted, substantially as described, for the purpose specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

PHILIP M. HAAS.

Witnesses:
A. E. H. JOHNSON,
J. W. HAMILTON JOHNSON.