

(No Model.)

T. L. THOMAS & J. B. HILLMAN.
APPARATUS FOR WIPING GALVANIZED TUBES.

No. 525,567.

Patented Sept. 4, 1894.

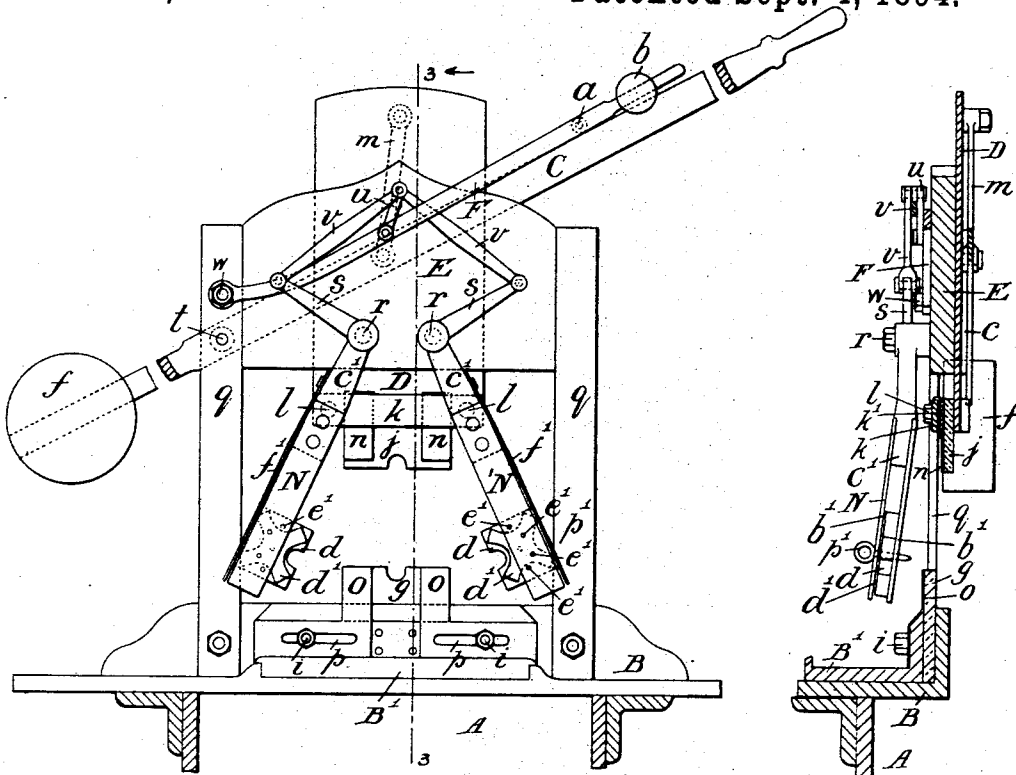


Fig. 1.

Fig. 3.



Fig. 2.

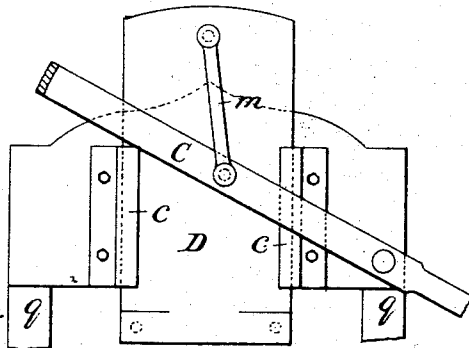


Fig. 4.

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APPARATUS FOR WIPING GALVANIZED TUBES.

SPECIFICATION forming part of Letters Patent No. 525,567, dated September 4, 1894.

Application filed March 9, 1894. Serial No. 502,957. (No model.)

To all whom it may concern:

Be it known that we, THOMAS LESTER THOMAS and JOSEPH BEARD HILLMAN, both subjects of the Queen of Great Britain, and residing at Princes End, near Tipton, in the county of Stafford, England, have invented certain Improvements in Appliances for Wiping Galvanized Tubes, Bars, and the Like, of which the following is a specification.

This invention relates to the wiping of tubes and bars by drawing them through soft wiping dies (such, for instance, as asbestos dies) before the molten coating metal, taken onto their surfaces by immersing them in the galvanizing bath, has set; that is to say, to a process of wiping tubes and bars similar to that described in the United States Patent No. 469,925. In the apparatus described in said patent two notched dies only are used for wiping the tubes and bars, and it is found in practice that if, as is not infrequently the case, there are irregularities in the diameter of a tube or bar which is being drawn through the dies, the notches in the dies become widened out by the portions of larger diameter of the tubes or bars and do not then so effectually wipe the sides of the portions of small diameter.

Now, this invention has for its object means whereby tubes and bars, and lengths of hoop metal, are more thoroughly wiped than heretofore, as they leave the coating bath.

An embodiment of the invention is illustrated by the accompanying drawings, where-
in—

Figure 1, is a rear elevation of a set of wiping dies through which a tube or bar is drawn as it leaves the coating bath, the view showing the means by which the said dies are carried and operated. Fig. 2, is a plan of the apparatus shown in Fig. 1. Fig. 3, is a vertical section taken on line 3, 3, of Fig. 1. Fig. 4 is a front elevation of the upper part of the apparatus shown in Fig. 1.

Referring to the drawings: The angle-plate, B, and top and bottom or vertical dies, *j* and *g*, correspond, respectively, to the like parts in the said former patent, No. 469,925, and the galvanizing bath A, of which the upper part of one end only is shown, (in section, in Figs. 1 and 3) corresponds to the bath, simi-

larly lettered, in said patent. In the present apparatus, however, a pair of side or lateral wiping dies, *d*, *d*, are employed, which operate at right-angles (or approximately so) to the pair *j*, *g*, and to the rear thereof as shown; or they may be in front thereof, if desired. The lower die, *g*, is fixed, and the upper die, *j*, is pressed down by means of a lever C, as is the case with the vertical dies described in the said former patent. For convenience, however, in utilizing the lever C for the purpose of opening out the side dies, as herein-after described, the die *j* is, according to the present invention, fixed to a holder D, which is capable of sliding against a plate E, fixed to standards *q*, and within vertical guides, *c*, fixed to such plate, and such holder is connected with the lever C by means of a link *m* (see Fig. 4.)

Both the upper and lower vertical dies are strengthened, according to this invention, against yielding backward, (whether they are to be used alone or in combination with the side dies *d*, *d*), by backing-pieces which are made adjustable to suit any width of die. In the case of the upper die *j*, these backing-pieces consist of thin pieces of metal, *n*; these are firmly held in place between a bar *k*, which corresponds to the bar similarly lettered in the said former patent, and an inner bar *k'*, which bears directly against the die *j*.

When the bolts *l*, by means of which the bar *k* is tightened up, are themselves tightened up, the backing-pieces *n* are securely fixed and the inner bar *k'* is pressed tightly against the face of the die *j*, the die being thus securely held in place against the holder D. The top ends of the backing-pieces *n* are bent outward at right-angles, as shown, to rest upon the top of the bar *k*. When the bolts *l* are slackened, the backing-pieces *n* may be slid along sidewise between the bars *k* and *k'* to adjust them widthwise in position, as may be desired. These backing-pieces are cranked inward below the bar *k'*, as shown in Fig. 3, so that they may bear against the rear face of the die. In the case of the lower die *g*, the backing-pieces consist of thin plates, *o*, each having an angle-shape, as seen in Fig. 1, of which one member is vertical, and of which the other extends sidewise in a

horizontal direction from the bottom of the vertical member. Each backing-piece *o* is securely fixed by means of one of the bolts, *z*, which are used to fix the die *g* to the angle-plate B; and for such purpose the bolts pass through slots *p* formed through the horizontal members of the backing-pieces. Thus the backing-pieces *o* can, when the bolts are slackened, be moved toward or from one another to adjust them in position to suit the width of die which is at the time being used. The die *g* is held to the angle-plate B by means of an upper angle-plate, B', as clearly shown in Fig. 3; and the lower members of the backing-pieces *o* extend along the face of the upright member of the angle-plate B', their vertical members being bent to the shape shown in Fig. 3, so that the upper portions thereof may bed or fit against the rear face of the die *g*.

The side dies *d d* are carried in holders N, N. These holders are pivoted, respectively, at *r, r*, to the plate E, and have each an arm *s* which extends outwardly at an angle therefrom at the pivoted end of the holder. The outer ends of the arms *s* are coupled to links *v*, which incline upward therefrom and are coupled together and to the upper end of a short link *u*. The lower end of this link *u* is pivoted to a lever F, which is fulcrumed at *w*, to one of the standards *q* of the frame. On the outer end of this lever F, is fixed a weight, *b*, which, when the lever ceases to be held up (as hereinafter described), weights down the lever and operates through the medium of the links *u*, and *v v*, and the arms *s, s*, to move the holders N, N, toward one another, and thus close the dies *d d* against opposite sides of a tube or bar, if such is at the time entered between the dies.

It will be seen that the means of connection between the lever F and the arms *s s*, causes an equal pressure to be transmitted to each die *d*, so that the dies will press with equal force against the opposite sides of a tube or bar as it is drawn through the apparatus. Should one of the dies be subjected to a momentary pressure in excess of the other die, it will yield slightly and thus put a greater pressure upon the other die, so that the pressure always tends to balance itself on each side of the tube or bar. The dies *d d* thus readily adapt themselves sidewise, or by a lateral swing, to any irregularities in the surface of a tube or bar; and if, owing to the wear on one side of the vertical dies, the tube or bar passes through the dies somewhat out of the proper center of the apparatus, the dies *d d* readily swing and adjust themselves to such position of the tube or bar.

The lever C is provided, preferably, with a handle at its outer end, and with a weight, *f*, on a prolongation beyond the fulcrum *t*, as in the case of the lever C described in the said former patent; and thus, when such lever is not pressed down by hand, it remains elevated in the position shown on the drawings,

with the upper die *j* in its upraised position. A stud *a* is fixed to the lever F in position to extend across the upper edge of the lever C, and thus the lever C cannot rise to its upraised position without lifting up the lever F; and the weight *f* and its leverage is such that it will raise not only the lever C, holder D, and parts carried thereby, but also the lever F and consequently open out the dies *d d*.

When it is desired to wipe a tube or bar by means of the appliance illustrated in Figs. 1 to 4 inclusive, the forward end of the tube is entered between, and passed sufficiently beyond, the dies to enable it to be taken hold of by a pair of tongs. The lever C is then depressed, whereby the top die *j* is brought down upon the tube or bar and presses it between itself and the bottom die *g*. The weight *b* also operates at the same time to close up the side dies *d d* upon the tube or bar, on each side. The weight *b* may be, comparatively, quite moderate, as a slight pressure of the side dies against a tube or bar is sufficient for the purpose of wiping it, and the weights of the lever F, link *u*, links *v, v*, arms *s, s*, and holders N, N, all operate in combination with the weight *b* to produce the desired effect.

When a tube or bar has been drawn through between the dies, the lever C is freed and permitted to be raised by the weight *f*; and not only is the top vertical die *j* raised thereby, but the lever C taking under the stud *a* raises also the lever F and thus moves the side dies *d d* apart.

The holders N N for the side dies are each made with a slot to receive a die, the portion of the holder which receives the die being conveniently made of a pair of flat bars, *b'*, distanced apart by means of a shank, *c'*, to which they are riveted, so as to leave a space between them for the die. Each die is, preferably, backed by a thin plate *d'*, and it and such plate is held between the two sides of the holder by means of a pin which passes through one of a number of holes *e'* in the sides *b'* of the holder, such pin passing also through the die and backing-plate *d'*. The back of each die is made flat, as shown, and a spring, *f'*, presses against such back. Each die may thus turn upon the axis of the pin which passes through it, to allow of the notch in its working edge to yield upward or downward to suit the exact position of the tube or bar, or to suit any irregularity in the surface thereof, the spring yielding backward somewhat under such turning movement of the die, and causing the die to turn back again into its normal position as soon as it ceases to be subjected to the force by which it was turned out therefrom.

The backing-plates *d'* may be shaped, as shown, so as to admit of a notch being formed in each of the four sides of the wiping material. The holders N, N, are shown as slanting backward (see plan, Fig. 2) so that the dies *d d* shall be in a plane at right-angles (or approximately so) to the inclination of a tube

or bar as it is drawn through the dies. These side dies need not be set in different planes, or so as to overlap.

The improvements above described in relation to the vertical dies or upper and lower dies, *j* and *g*, are applicable also in the case of similar dies used for wiping hoop-metal which has been dipped in molten spelter.

It will be noted that the characteristic feature of our apparatus is the employment of two pairs of wiping dies arranged to clamp the tube or bar at different but adjacent points, one pair being non-shifting, as a pair, when clamped on the tube, and the other being shiftable, as a pair, when clamped on the tube. This enables the second or last named pair to adjust itself to the tube clamped or gripped by the first named pair. At the same time, while the dies of the second, or shiftable pair, are clamped on the tube, each with a like yielding pressure due to a common weight which acts on both to cause them to clamp the tube, this weight leaves the pair free to shift and adjust itself to the tube without interference with the clamping pressure.

Having fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. An apparatus for wiping metal-coated or galvanized tubes, bars and the like, before the coating metal has set thereon, having two pairs of wiping dies, one pair of which is arranged in advance of the other pair and is set to operate substantially at right-angles thereto, substantially as and for the purpose set forth.

2. An apparatus for wiping metal-coated or galvanized tubes, bars and the like, before the coating metal has set thereon, having two pairs of wiping dies, one pair of which is arranged in advance of the other pair and is set to operate substantially at right-angles thereto, and of which one pair has one of its dies connected with an operating lever by means of which it can be advanced toward the other die, and with a counter-balance weight by means of which it can be drawn back therefrom, and of which each die of the other pair is provided with a weight by means of which they are closed automatically on the tube or bar, substantially as set forth.

3. In an apparatus for wiping galvanized tubes, bars and the like, the combination with the wiping dies *g* and *j*, the holder of the movable die *j*, and the lever *C* for operating said holder, of the wiping dies *d*, *d*, their pivoted holders *N*, *N*, provided with arms, *s*, *s*, the lever *F*, the link *u*, coupled at one end to said lever, and links *v*, *v*, coupling the other end of the link *u* to the arms *s*, *s*, said lever *F* engaging some part of the lever *C*, whereby

the lifting of the latter lever assures the up-raising of the lever *F*, substantially as and for the purpose set forth.

4. In an apparatus for wiping galvanized tubes, bars and the like, before the coating metal has set thereon, the combination with a non-shiftable pair of wiping dies adapted to clamp the tube, and a shiftable pair of dies adapted to operate at right-angles, or substantially so, to the non-shiftable pair, said pairs of dies being set in different planes of means for exerting a yielding clamping pressure on the dies of the shiftable pair, and means for operating both sets of dies, substantially as set forth.

5. In an apparatus for wiping galvanized metal tubes, bars and the like, before the coating metal has set, thereon, a pair of wiping dies carried by holders situated on opposite sides of a tube or bar which is being wiped, said dies having a weight arranged to close them on the tube or bar, and being connected with one another through the medium of compensating mechanism which insures their readily adjusting themselves to suit the position of the tube or bar or to any irregularity in the surface thereof, substantially as described.

6. In an apparatus for wiping galvanized or metal-coated bars and the like, the combination of the wiping dies *d*, *d*, the pivotally mounted holders *N*, *N*, in which said dies are mounted, the arms *s*, *s*, on said holders, the operating lever *F*, the link *u*, coupled at one end to said lever, and the links *v*, *v*, coupling the respective arms *s*, *s*, to the link *u*, substantially as set forth.

7. In an apparatus for wiping galvanized or metal-coated bars and the like, the combination with the die-holders *N*, *N*, of the wiping dies *d*, *d*, mounted pivotally in the respective holders, and springs mounted on the holders and arranged to press on the backs of the respective dies, said dies having their pivotal axes parallel to that of the bar being wiped, substantially as set forth.

8. The combination with the die-holder and the notched die secured thereto, of stiff backing pieces, to reinforce the die, mounted adjutably on the holder and applied to the back or rear face of the die, substantially as set forth.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

THOMAS L. THOMAS.
JOSEPH B. HILLMAN.

Witnesses:

STEPHEN WATKINS,
JOHN NEVE.