No. 649,776. Patented May 15, 1900.

J. E. & A. TASCHER.

MACHINE FOR MAKING METALLIC CLAMPS FOR PACKING CASES.

(Application filed Sept. 9, 1899.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.

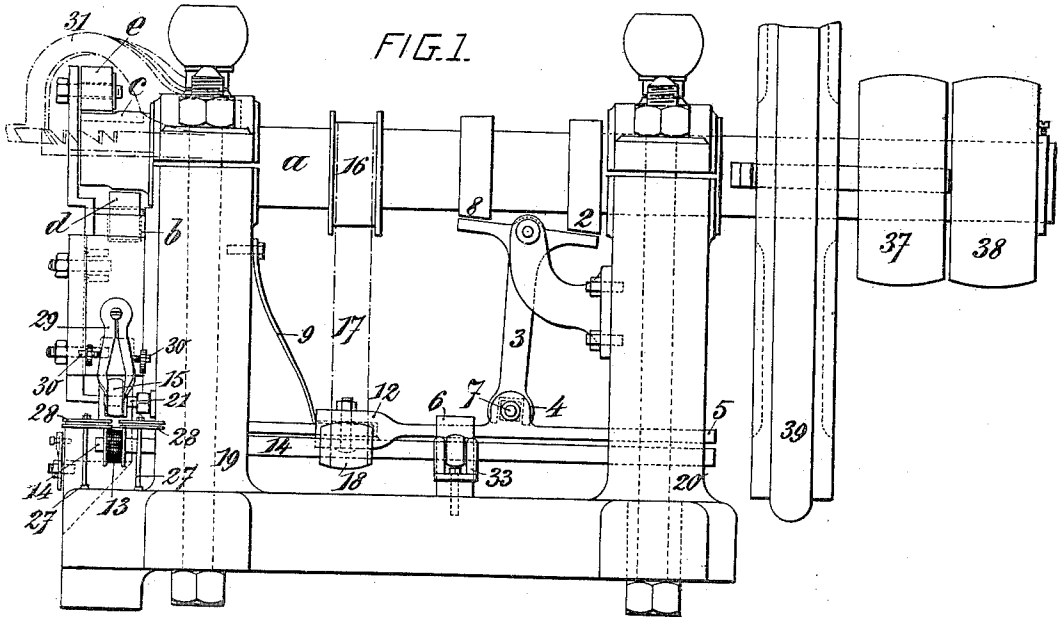
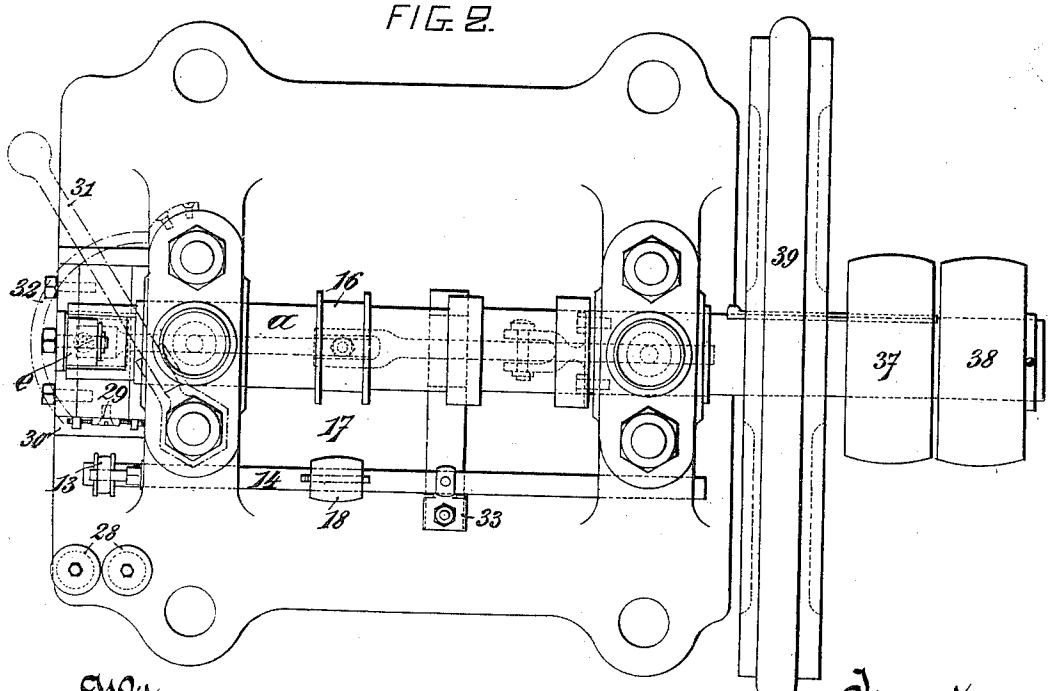


FIG. 2.



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FIG. 3.

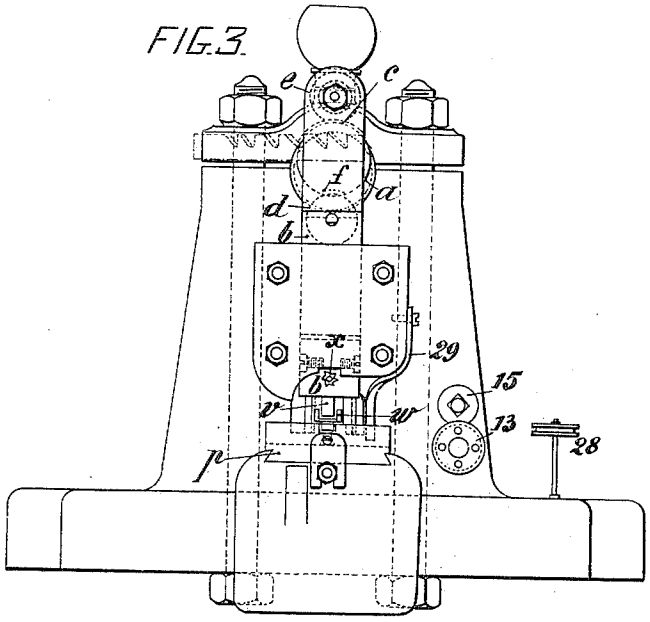


FIG. 6.

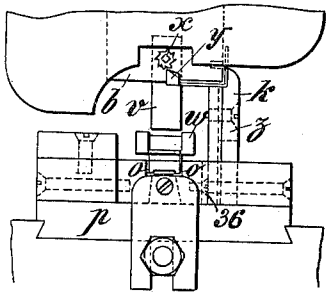


FIG. 4.

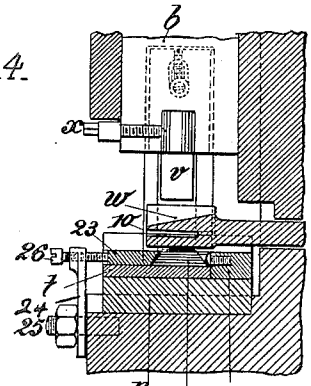


FIG. 10.



FIG. 11.



FIG. 7.

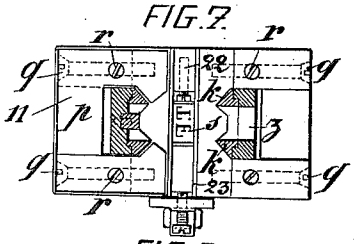


FIG. 8.

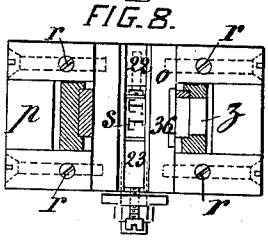


FIG. 5.

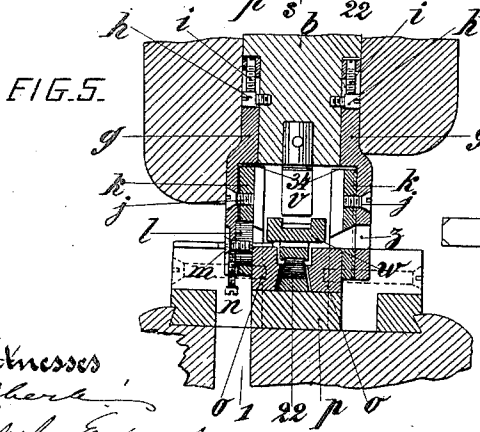


FIG. 12.

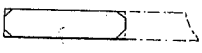
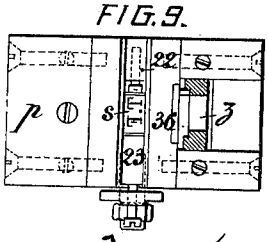


FIG. 9.



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MACHINE FOR MAKING METALLIC CLAMPS FOR PACKING-CASES.

SPECIFICATION forming part of Letters Patent No. 649,776, dated May 15, 1900.

Application filed September 9, 1899. Serial No. 729,915. (No model.)

To all whom it may concern:

Be it known that we, JULES ERNEST TASCHER and ALFRED TASCHER, of 65 Rue de la Croix Blanche, in the city of Bordeaux, Gironde, Republic of France, have invented an Improved Machine for Making Metallic Clamps for Packing-Cases, of which the following is a full, clear, and exact description.

This invention relates to an improved machine for the rapid manufacture of cramps or metallic stays such as are employed for closing packing-cases. The improvements relate more particularly to the means of operating the plunger, the feed, and the means for discharging the finished cramps or stays.

Reference is to be had to the accompanying drawings, forming part of this specification, wherein—

Figure 1 represents a side elevation, Fig. 2 a plan, and Fig. 3 a front elevation, of the machine. Fig. 4 is a longitudinal section, and Fig. 5 a transverse section, taken through the center of the plunger. Fig. 6 is an elevation showing the means for retaining the screw of the plunger-die and also a view of the bed-die, having a single straight cutter and fixed stop. Fig. 7 is a plan of a bed-die having cutters, one of which is provided with a stop. Fig. 8 is a plan of a bed-die having a straight cutter and a smooth movable blade serving as a stop. Fig. 9 is a plan of a bed-die with straight cutter and fixed stop. Fig. 10 is a perspective view of a cramp or stay, and Fig. 11 shows a modified form of cramp or stay. Fig. 12 represents the manner of cutting the cramp or stay from a strip.

a is the cam-shaft of the machine, which works the plunger or die-holder *b* in the following manner: The extremity of shaft *a* carries at its point of greatest eccentricity a cam *c*, dovetailed thereon and forming a raised portion a few millimeters in depth, so that when the plunger or die-holder descends to its lowest position and the cam comes in contact with the roller *d*, mounted upon the head of the plunger, there is no appreciable friction. The roller *d* is mounted on a steel spindle supported in the two sides of the head of the plunger, which is recessed to receive the roller. When the plunger is in its lowest position and the shaft continues to rotate, the eccentric portion of the latter will again raise the plunger by acting on roller *e*, which latter, however, in the highest position of the shaft does not come in contact with the enlarged portion of cam *c*, which is shouldered for the express purpose of allowing it to pass without causing any shock, and similarly the recess *f*, Fig. 3, made in the end of shaft *a*, permits the roller *d* to pass freely when in its lowest position, which would not otherwise be possible, owing to the projecting portion of cam *c* when it is in its lowest position and bears against the roller *d*. The advantage of this method of operating the plunger will be readily perceived, as it permits of very rapid working without overheating, owing to there being no appreciable friction except at the moment of acting and then only at a single point of the cam and roller *d*, which are both made of hardened steel and kept well lubricated. If the plunger were operated by a connecting-rod with a head embracing the eccentric portion of the shaft end, considerable friction would be caused, (as is the case in certain kinds of stamping-machines,) which would necessitate a very slow rate of working—viz., about sixty revolutions per minute—whereas by the arrangement described the machine is enabled to normally work at a speed of four hundred revolutions per minute without overheating.

g g, Fig. 5, are two legs or supports for the cutters, carried by the plunger *b*, these legs being made of steel, of dovetailed form, and let into the sides of the plunger and there secured by means of screws *h*, which pass through slot-holes in the legs, the shape of the holes permitting of the legs being lowered to compensate for wear of the cutters.

i i are screws which are slackened to the same extent as the legs are lowered, and since the heads of said screws bear against the ends of the recesses made in the plunger for the reception of the legs and the points of the screws bear against the heads of screws *h* it will be evident that if after having lowered the legs the screws *h* should become unscrewed the legs will be prevented from having any play in the longitudinal direction.

The cutters or shears *k* are secured to the legs *g g* by means of screws *j*, and at *l* on the rear knife is a small block of steel, serving as a stop, this block being secured to the leg by

means of a screw *m*, passing through a slot which permits of its being raised as the cutter becomes worn.

n is a small screw for clamping screw *m* after the stop has been raised.

The cutters *k*, which may vary in form according to requirements, are nicely adjusted within those of the matrix *p*. The matrix *p*, which rests upon a cast anvil-block on the framing, is made of hardened steel, and its cutters *o*, which are also hardened, are secured by means of screws *q*. *r* represents set-screws for fixing said screws *q* and so preventing the cutters *o* from rising. Between these two cutters is a space of dovetailed form, bounded by the profile of said cutters and extending throughout their length, said space serving as a slot through which to introduce the engraved steel die *s* for stamping the cramps or stays, the height of the die being regulated by means of a steel block *t*, placed beneath it. The cutters are provided above the surface of the die with shoulders, the space between which serves to bend the cramp or stay *u* to the shape shown in Figs. 10 and 11 with the aid of the upper die or follower *v*, which is secured in the base of the plunger by a ratchet-headed screw *x*, which is prevented from loosening while working by a spring-pawl *y*. At the moment of descent of the plunger *b* a strip of metal of the width of the cramp to be formed is passed through the aperture *z* in the leg or support of the front cutter (see Figs. 5, 6, 7, 8, and 9) until it abuts against the small stop-block 1 of the rear cutter, when the descent of the plunger causes a piece to be cut from the strip, as shown in Fig. 12. The angles of the strip, (indicated in dotted lines in Fig. 12,) which are cut off by the rear cutter, pass away through the opening *l* in the base-block corresponding to the mortised part of the matrix in which the rear cutter works. The follower *v* in continuing its descent presses down the piece of metal which has been cut from the strip and bends it between the two shoulders of the cutters *o* of the matrix at the same time that the face of the cramp or stay is forcibly pressed by the follower, so as to impress upon it the characters engraved upon the bed-die, thus completing the formation of the cramp.

The finished cramp is discharged from the matrix with the aid of a pusher *w*, which at the moment when the plunger *b* rises is thrust forward by the nose of cam 2, Fig. 1, keyed on shaft *a*, acting on a T-shaped lever 3, mounted to oscillate upon an arm bolted to one of the standards of the machine, the opposite end of said lever being forked at 4 and connected to the pusher-rod, which slides in mortises made in the standards, as at 5, and also in a guide 6, bolted to the framing. The forked end of lever 3 incloses a small square bearing-block which slides between the flat interior surfaces of the fork and through which passes a bolt 7, serving to connect the said forked lever with the pusher-rod. When the pusher is at the end of its stroke and has removed the cramp from the matrix, it is suddenly returned to its rearward position by the cam 8 and spring 9; but before said cam has effected its withdrawal the metal strip from which the next cramp is to be cut has been again entered in the aperture in the support of the front knife, which has just been unmasked. At the same time the base of said aperture raises the strip slightly above the bed-cutters in order that it may properly engage therewith. The pusher is split, as shown at 10 in Fig. 4, to give passage to the strip which is to be cut and at the same time to guide the strip until it is engaged beneath the rear cutter. In Fig. 7 is also shown at 11 a steel plate having a flared opening which bears flat upon the bed-die and rear cutter for the purpose of laterally guiding the strip of metal in the aperture of the rear cutter, said plate 11 being held fixed by means of the set-screws *r*. At the moment when the strip has reached its proper position relative to the cutters the pusher is withdrawn from the bed-die to allow the plunger to descend to form another cramp, and so on.

The flat spring 9, which is mounted upon one of the standards and abuts against the end of the socket 12 of the pusher-rod, serves to exert a constant thrust upon the latter in order to maintain the T-lever 3 in constant contact with cam 2, and thus avoid the concussion and consequent noise which would be caused by any play or looseness of working either of the T-lever or cams through wear.

In order to avoid the necessity of pressing forward by hand the strip of metal from which the cramps are to be cut, we provide, as shown in Figs. 1, 2, and 3, a feed-roller 13, mounted on the end of a shaft 14, said roller being formed of leather washers compressed between cheek-plates, of which the front one is provided with a tightening-screw. Above this leather roller is mounted an idle iron roller 15.

The feed movement of the strip is intermittent and is produced by means of the flanged eccentric cam 16, Fig. 1, keyed on shaft *a*, and around which passes a belt 17, which is also carried around a drum 18, keyed on the feed-shaft 14. It will be seen that when the eccentric portion of cam 16 comes into action the belt is put in tension and rotates the feed-shaft 14 and that after this portion of the cam has passed the belt being no longer in tension will cease to feed the strip inserted between the rollers 13 and 15. The feed-shaft rotates in two holes made in the standards at 19 and 20, the hole 19 being made of oval form on its upper side, so as to allow the shaft to rise as the leather roller becomes worn and enable said roller to press against the idle roller 15, and thus maintain such a grip on the metal strip as is necessary for feeding the latter forward. In order to further compensate for wear of the leather

washers composing the feed-roller 13, the idle roller 15 is mounted upon an eccentric spindle 21, which is firmly screwed into the frame and can be turned about its own axis more or less for the purpose of bringing the axis of roller 15 nearer to that of the feed-roller. The feed-cam 16 should be so keyed upon the shaft as to commence to feed the strip just at the moment when the aperture in the cutter-carrier rises sufficiently high to allow the strip to enter, as before described.

In order that the die-block *s* shall not be shifted in position by the movement of the pusher, in the bottom of the space in which said die-stamp is inclosed is placed a block 22, Figs. 4 and 5, carrying a screw-stud whose beveled head bears against the correspondingly-beveled shoulder of the die-block *s*, so that by screwing the stud in or out the die-block *s* can be moved forward or backward, the latter being beveled at each end, so as to engage under the beveled head of the screw, which thus prevents it from rising. The die-block is secured at its front end by means of a small steel block 23, mounted in a dovetailed seat in front of the die-block, the inner end of the block being beveled to fit the die-block and prevent the latter rising, while securing it in a longitudinal direction. The die-stamp *s* and block 23 are, like the block 22, loosely placed in the bed-die, the whole being locked with the aid of a forked plate 24, which is clamped to the frame by a screw and nut 25 and which serves as an abutment for wedges, by means of which the die-block (which may vary in breadth) is prevented from working forward or backward. Through the upper part of plate 24 passes a screw 26, serving as a stop for the die-stamp.

In order to maintain the rectilinear feed movement of the metal strip from which the cramps are to be cut, two slightly-flexible vertical stems 27 are mounted slightly in front of the feed-rollers 13 and 15, as shown in Figs. 1, 2, and 3, each of said stems carrying a grooved roller 28, between which the strip of metal is introduced. Immediately in rear of the feed-rollers and close to the front support of the cutter is a two-armed spring-guide 29, which also serves to maintain the movement of the strip (as it enters between the cutters) rectilinear and parallel to the cutters.

30 30 are two set-screws bearing one against each arm of the guide 29, so as to enable the latter to be adjusted to suit the width of the strip introduced.

In order when the machine is running empty to prevent the die-block being injured by the follower *v* striking it, a lever 31, Figs. 1 and 2, is pivoted in a strap which embraces the nut of the plunger-block bearing of the cam-shaft, said lever engaging by its own weight with the teeth of a quadrant-shaped rack 32, fixed to the cap of said bearing, the lever serving to slacken the nut of the plunger-block, and thus causing the stroke of the follower to be delivered with less force. The lever 31 also serves for tightening or slackening the cap of the bearing, according as it is desired that the follower should strike the cramp or the die-block with greater or less force.

33, Figs. 1 and 2, is a fork secured to the frame by means of a dowel fitting in a slightly-oval hole, said fork (between the limbs of which is received a small collar or sleeve keyed upon the feed-shaft 14) serving to shift the shaft 14 longitudinally in either direction, so that the feed-roller 13 may be always alined centrally between the cutters.

In order to make cramps of different sizes, interchangeable cutters or shears of assorted sizes would be required. The cutters may also be varied in form according to requirements.

The sides of the plunger corresponding to the inner faces of the cutter-supports are provided with oil-grooves communicating with channels 34, Fig. 5, in the upper surfaces of the cutters, whereby the faces of the latter are kept constantly lubricated.

As before mentioned, when it is desired to make cramps of different dimensions the head of the pusher, the cutters, and follower would be made each of a size corresponding to that of the cramp required, the head of the pusher having a tailpiece which is received in a socket 12, Figs. 1 and 2, on rod 5 and secured by means of a bolt.

In order to make cramps having their limbs squared at the corners, it is unnecessary to provide the plunger with two cutters, as in this case one front cutter and one stop fixed in rear of the bed-die suffices, as shown in Fig. 6. In this case the cutters of the bed-die would consist of simple blades provided with shoulders to form the cramp, and upon the front cutter would be let in and screwed a shear-blade 36, adapted to coact with the straight shear-cutter carried by the plunger. Cramps having straight limbs, Fig. 11, may also be produced by the means already described for use in the case of shaped cramps, with the single difference that in this case the front shear-cutter would be straight and coact, as above mentioned, with the shear-blade 36, the rear cutter being replaced by a straight removable blade acting as a stop.

37 and 38 are fast and loose pulleys for driving the machine by power. In order to drive it by hand, the pulleys would be dispensed with and the fly-wheel 39 be made of increased diameter and be provided with a crank-handle.

We claim—

1. A machine for making metallic cramps for packing-cases, consisting essentially in the combination of a plunger or ram carrying the upper die and cutters and mounted to slide freely in guides in the head-stock of the machine, said plunger carrying also a pair of rollers engaging with a cam on the

driving-shaft of the machine whereby the plunger is caused to reciprocate in its guides, the form of the cam and its arrangement relatively to the rollers being such that friction between the cam and rollers is avoided at the moments when the plunger reaches the highest and lowest points in its travel; a feed-roller mounted upon a shaft rotated intermittently by means of a belt passing over an eccentric pulley driven by the main shaft of the machine, and an ejector for the finished cramps, operated intermittently by means of a pair of cams mounted on the driving-shaft of the machine and in driving connection with the oppositely-directed arms of a T-shaped lever whose third arm engages with the stem of the ejector substantially as and for the purposes specified.

2. In a machine for making metallic cramps for packing-cases the combination with a plunger or ram carrying the upper die and cutters and mounted to slide freely in guides in the head-stock of the machine, of separate supports for the cutters, adjustably secured to the plunger as described, the rear support having an adjustable stop for the metal strip from which the cramps are to be formed, substantially as and for the purpose specified.

3. In a machine for making metallic cramps for packing-cases the combination with a ram or plunger carrying the upper die and cutters and mounted to slide freely in guides in the head-stock of the machine, said plunger also carrying a pair of rollers engaging with a cam on the driving-shaft of the machine whereby the plunger is caused to reciprocate in its guides, of means for adjustably slackening the cap of that bearing of the driving-shaft which is adjacent to the cam, so as to enable the force with which the blow of the upper die is delivered to be regulated substantially as and for the purposes specified.

The foregoing specification of our improved machine for making metallic cramps for packing-cases signed by us this 22d day of August, 1899.

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ALFRED TASCHER.

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