(No Model.)

3 Sheets—Sheet 1.

J. RUSSELL.

MACHINE FOR MAKING BUILDING ANCHORS.

No. 385,140. Patented June 26, 1888.

Fig. 2.

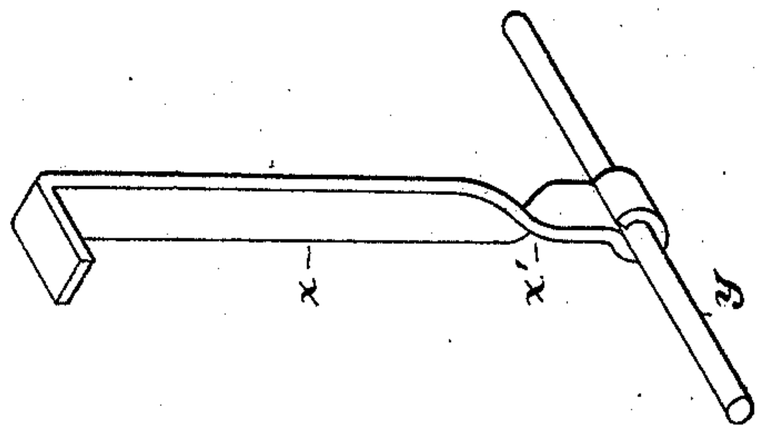
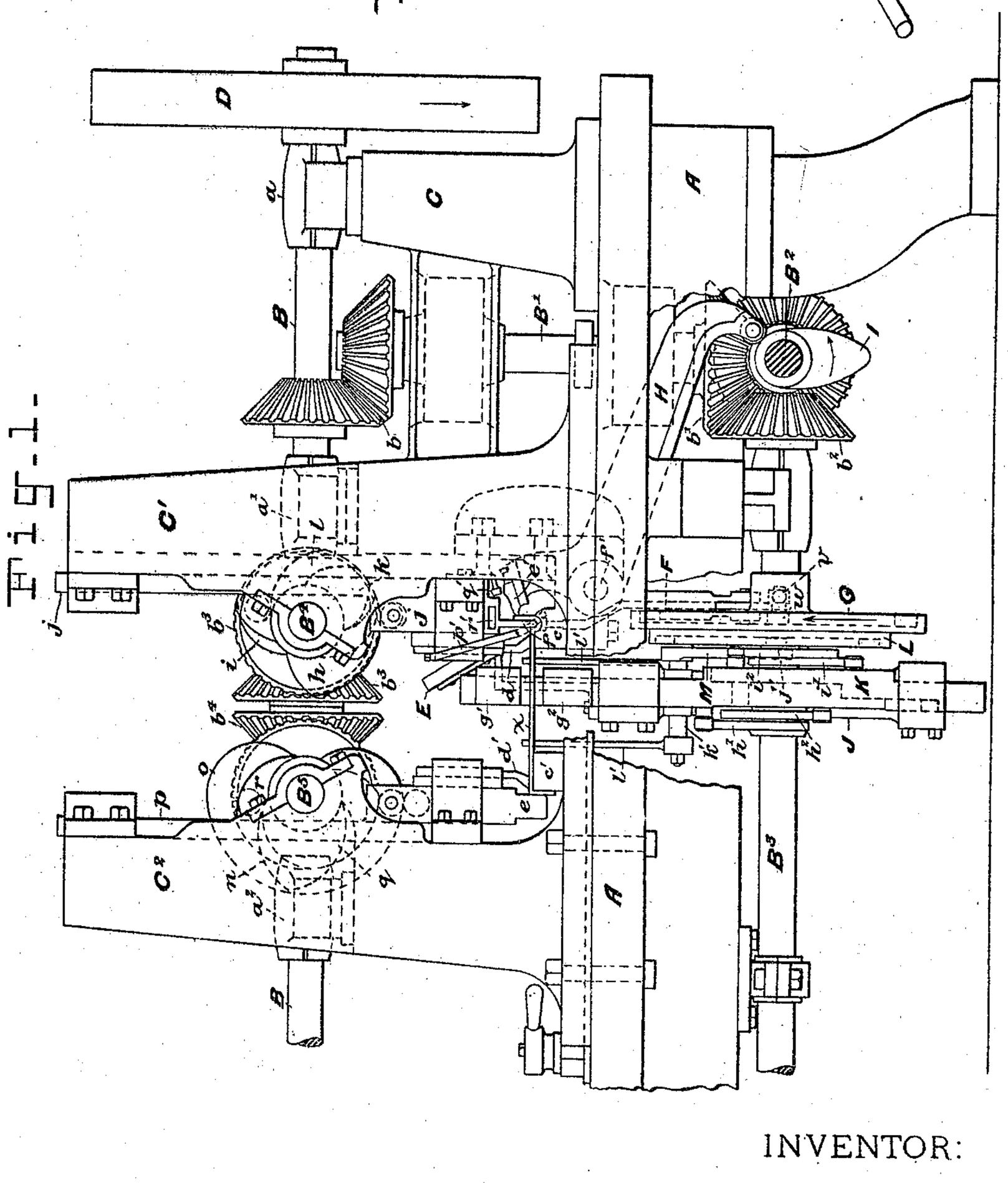


Fig. 1.



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H. W. Baplinger.

(No Model.)

3 Sheets—Sheet 2.

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MACHINE FOR MAKING BUILDING ANCHORS.

No. 385,140. Patented June 26, 1888.

Fig. 1.

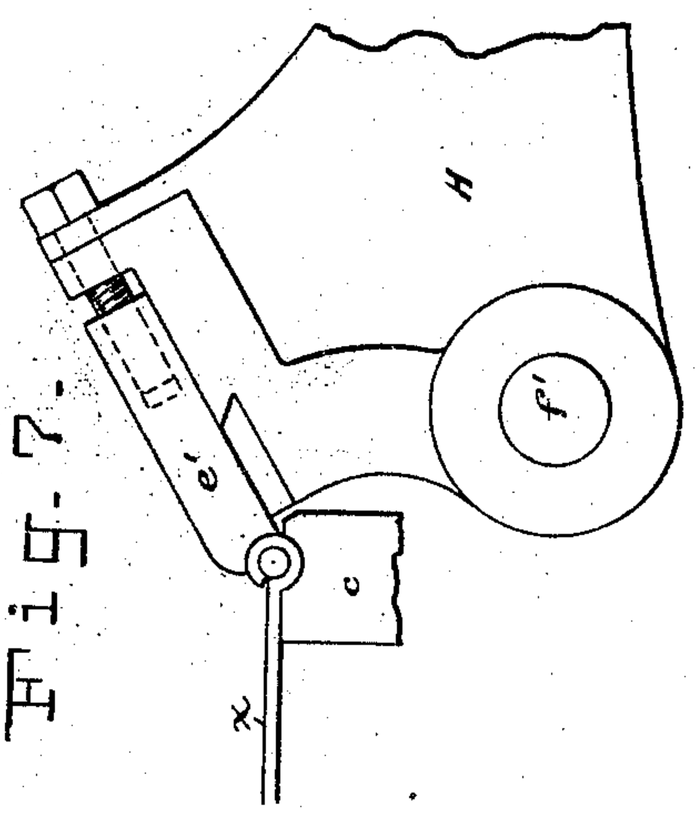


Fig. 4.

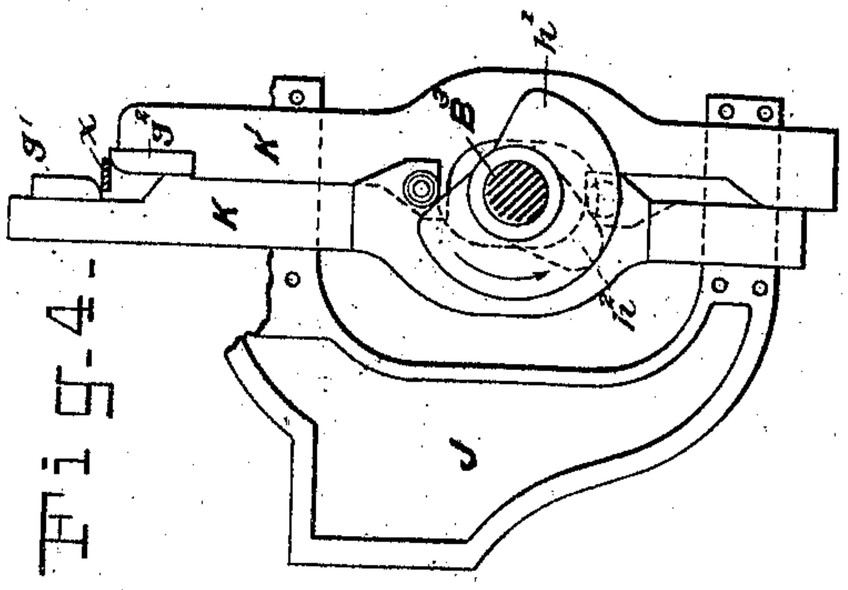
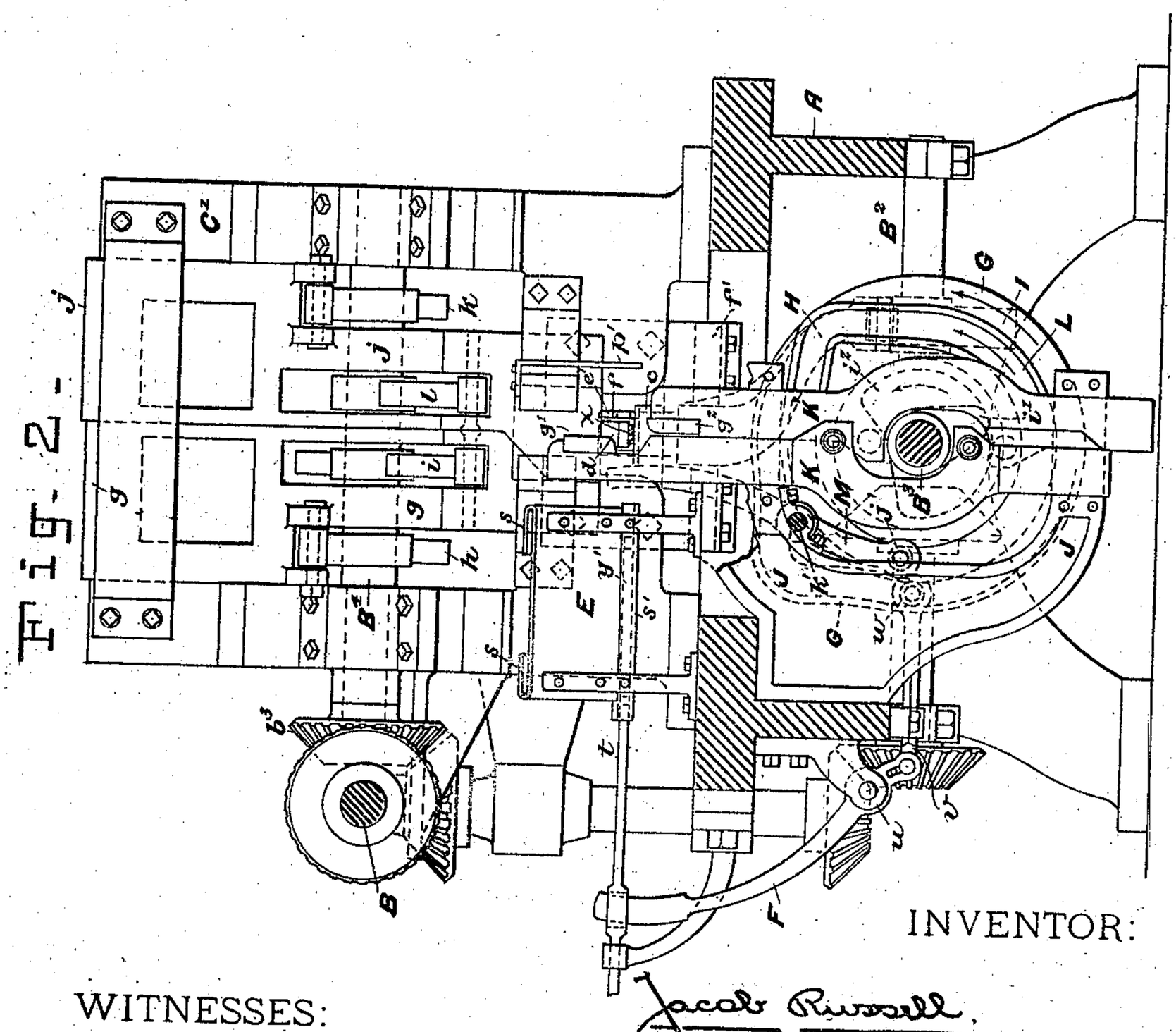


Fig. 2.



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3 Sheets—Sheet 3.

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MACHINE FOR MAKING BUILDING ANCHORS.

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Fig. 5.

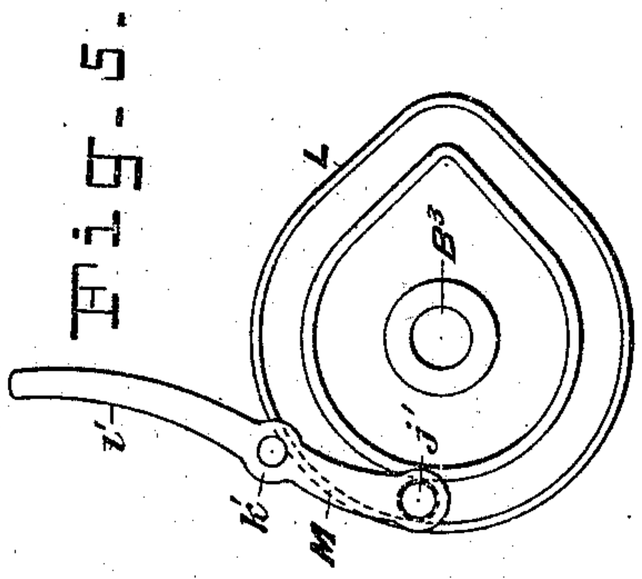


Fig. 6.

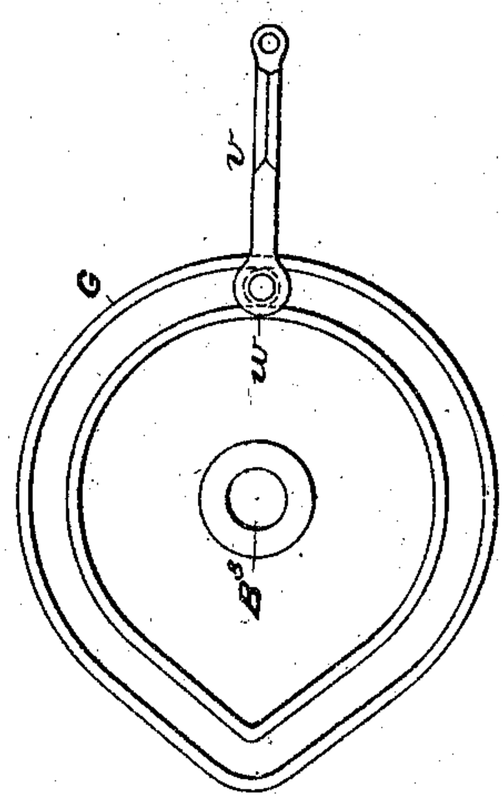
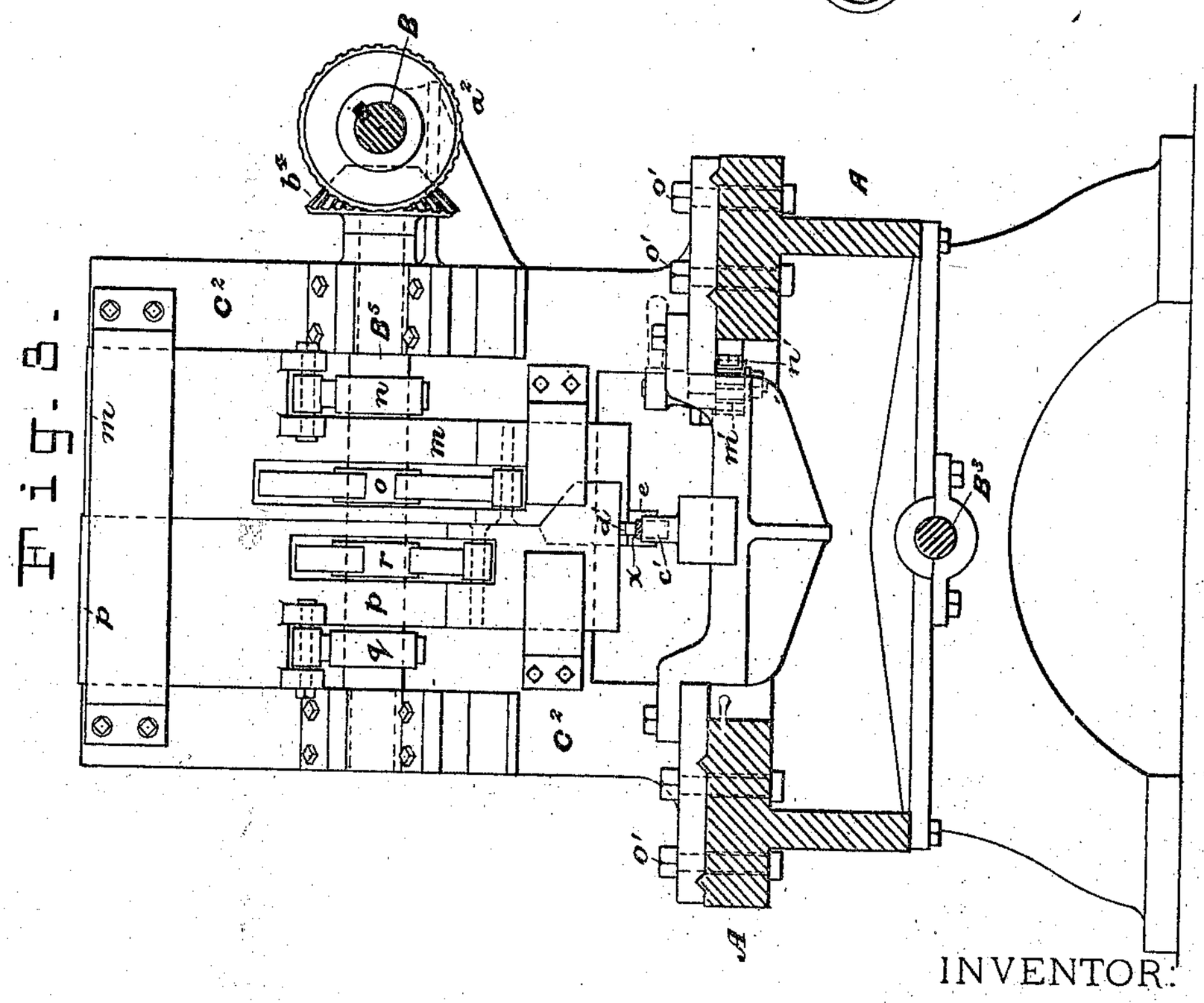


Fig. 8.



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UNITED STATES PATENT OFFICE.

JACOB RUSSELL, OF BROOKLYN, NEW YORK.

MACHINE FOR MAKING BUILDING-ANCHORS.

SPECIFICATION forming part of Letters Patent No. 385,140, dated June 26, 1888.

Application filed February 21, 1888. Serial No. 264,786. (No model.)

To all whom it may concern:

Be it known that I, JACOB RUSSELL, a citizen of the United States, and a resident of Brooklyn, Kings county, New York, have invented an Improved Machine for Making Building-Anchors, of which the following is a specification.

My invention relates to a machine for making that class of devices used in building and known as "building-anchors," and designed for bracing and strengthening walls and tying them to the floor-timbers. As usually constructed by hand and as made by my machine the anchor is composed of a flat bar of wrought-iron, one end of which is bent around and firmly clasps a cross-bar, usually of round iron, at its middle. This latter bar is commonly called the "spear." The flat bar is twisted a quarter-way round just back of the spear, and at its end opposite to the spear said flat bar has a claw or lip bent on it laterally, giving it an L shape at this end.

The object of my invention is to provide a machine that will by successive operations on the two plain bars or elements of the anchor, without handling, join said elements together, twist the body, make the L-shaped bend, and discharge the anchor complete and ready for use.

My invention will be hereinafter fully described, and its novel features carefully defined in the claims.

In the drawings, which serve to illustrate my invention, Figure 1 is a side elevation of the machine, taken from the feeding side, the side of the bed being partly broken away to better illustrate some of the mechanism. Fig. 2 is a transverse section of the machine, taken on line 2 2 in Fig. 1, looking toward the right in the latter figure. Fig. 3 is a similar transverse section taken in the same plane as Fig. 2, but looking in the opposite direction. Fig. 4 is a detached view of the twister. Fig. 5 is a detached view of the cam device for discharging the finished anchor, and Fig. 6 is a detached view of the cam for feeding the spears from the hopper into the machine. Fig. 7 is a detached and enlarged view of the closing-die. Fig. 8 is a perspective view of an anchor, the product of the machine.

I will premise the description of my machine by saying that it is designed to complete an anchor at each revolution of the main shaft, when the machine will be automatically stopped by a shifter. It will be set in motion again by the operator as soon as he has placed a bar for the next anchor. I have not deemed it necessary to show this automatic stopping device, as such devices are in common use on many machines and it forms no essential part of my machine.

A is the bed of the machine. This bed I have broken away at the left in Fig. 1, as it may be of any length desired, and the left-hand end will be or may be constructed precisely the same as the right-hand end, seen in this figure.

B is the main shaft, rotatively mounted in bearings at a a' a^2 in brackets on the several frames C C' C^2 on the bed A. Shaft B drives a vertical shaft, B', through bevel-gears b. Shaft B' drives a horizontal transverse shaft, B^2, through gears b', and shaft B^2 drives a longitudinal horizontal shaft, B^3, beneath the bed, through gears b^2. The main shaft B also drives a cross-shaft, B^4, mounted in frame C' through gears b^3, and a cross-shaft, b^5, mounted in frame C^2 through gears b^4. All the gears b b' b^2 b^3 b^4 are, by preference, of the same size, so that all of the various shafts will be driven at the same speed.

D is a wheel on the main shaft B, by which or through which power is applied to said shaft. The shafts B^2 B^3 B^4 B^5 are all distinctively cam-shafts. Shaft B' merely connects the main shaft with the shafts below the bed of the machine.

In the several figures, x represents the body of the anchor made by the machine, or the bar from which it is to be formed, and y represents the spear or cross-bar, usually of round iron. Fig. 1 shows the bar x in place in the machine and the work on it partly completed. Its right-hand end, where the spear is to be attached, is seen resting on a fixed die, c, on the machine-frame, and its left-hand end is seen resting on a die or anvil, c', also secured to the machine-frame. The first presser-foot, d, is resting on the bar at the right and holding it firmly down upon die c, and the second presser-foot, d', is resting on the bar at the left and holding that end of it down firmly on anvil c'. The end-bender e, which forms the L-like bend on the end of the bar, is

seen at the left in Fig. 1 at the end of its down-stroke and ready to rise, and the plunger-die *f*, which forms the primary half of the eye in the end of the bar to receive the spear, is seen at the right in Fig. 1 at the end of its down-stroke, the metal of the bar having been bent down into the semicircular hollow in die *c*.

The several vertically-moving parts are secured to sliding plates, and are moved up and down by properly-shaped cams. By reference to Figs 2 and 3 these parts will be best understood. The foot *d* is carried by a sliding plate, *g*, (see Fig. 2,) mounted to play in guides in frame C', and it is moved upward by a cam, *h*, on shaft B^4, and downward by a cam, *i*, on the same shaft. The plunger-die *f* is carried by a sliding plate, *j*, also mounted in guides in frame C', and is moved upward by a cam, *k*, and downward by a cam, *l*. These cams also are on shaft B^4.

Reference to Fig. 3 will make clear the means employed for operating the foot *d'* and the bender *e*. The foot *d'* is carried by a sliding plate, *m*, which plays in guides in the frame C^2, and said foot is moved upward by a cam, *n*, on the shaft B^5, and downward by a cam, *o*, on said shaft. The bender *e* is carried by a sliding plate, *p*, which plays in guides on frame C^2, and is moved upward by a cam, *q*, on shaft B^5, and downward by a cam, *r*, on said shaft. The several sliding plates will be provided with suitable rollers to bear on the cams. The cams that actuate the two presser-feet, the plunger-die, and the bender will have the proper forms to impart to same the proper extent of movement up and down and will be set so as to time these movements properly—that is to say, the two feet *d d'* descend first, (after a bar, *x*, is placed,) and then the plunger-die and bender descend simultaneously, do their work, and immediately rise. The foot *d'* adjacent to the bender *e*, also rises, but the foot *d* remains in place. The next operation is the placing of the spear *y* in the partially-formed eye produced by plunger-die *f*, and I will now describe the means I employ for effecting this.

E is a hopper to receive the spears. This hopper may be of sheet metal, set inclined on the machine-bed, and provided at its ends with inturned folds *s s*, Fig. 2, to form keepers, and a semi-tubular trough-like receiver, *s'*, at its lower edge. The spears are introduced at the top sidewise until the hopper is full, the lower spear always resting in the trough *s'*. This hopper will be kept filled by an attendant. The trough *s'* is aligned with the partly-formed eye in the end of bar *x*, which rests in die *c*, and the bottom spear, lying in said trough, is pushed out longitudinally and into place in said eye by a pusher, *t*, suitably guided in bearings and adapted to play in said trough. This pusher is actuated by a lever, F, fulcrumed at *u* on the side of the bed and coupled at its lower end to a slide-rod, *v*, the other end of which bears a stud or roller, *w*, which engages the groove in a cam, G, on the shaft B^3. This cam and the rod *v* are shown detached in Fig. 6, in which view the observer sees the cam from the opposite direction to that from which he sees the parts in Fig. 2. When the spear has been pushed into place, the eye in bar *x* is closed, and the metal made to embrace the spear by a closing-die, *e'*, on the end of a lever, H, which is fulcrumed in the bed at *f'*, and has a roller in the end of its tail or longer arm that bears on a cam, I, on cross-shaft B^2. This cam is so set as to drive the closing-die forward in a slightly-curved path downward, whereby the hot metal of the bar is caused to tightly embrace the spear. The cam then allows the die to recede. Simultaneously with this closing of the eye around the spear the the body of the anchor is twisted, as seen at *x'* in Fig. 8. The mechanism that accomplishes this will now be described with especial reference to Figs. 1, 2, and 4.

In a bracket, J, under the bed A, are mounted in suitable guides, so that they may play vertically, two slides, K and K'. These slides are provided at their upper ends with jaws *g' g²* respectively, which effect the twisting. The twisting is effected as follows: The jaws *g' g²* stand during the primary operations of the machine in the positions seen in Fig. 2—the former above the bar *x* and the latter below it. At the proper moment the jaw *g'* is drawn down and the jaw *g²* pushed upward simultaneously. The bar *x* being in their paths they strike and twist it. Fig. 4 shows the position of the jaws when they have come in contact during their movement with the opposite faces of the bar. When the jaws come opposite each other, the bar will stand between them and on edge. The slides and jaws now instantly return to their first position. The movement is imparted to each of the slides by two cams on shaft B^3. Cam *h'* raises slide K and cam *h²* draws it down. Cam *i'* raises slide K' and cam *i²* draws it down. Cams *h'* and *i²* may be alike, and cams *h²* and *i'* may be alike. These cams bear on laterally-projecting rollers on their respective slides. Fig. 4 shows the forms of the cams that actuate slide K in their proper relative positions. As soon as the twister has completed its work presser-foot *d* rises and the finished anchor is pushed off the dies *c c'* and falls on some suitable carrier under the machine. (Not shown.)

I will now describe the device employed for pushing off the finished anchor.

On the shaft B^3, and adjacent to the cam G, is a cam, L. (Seen detached in Fig. 5.) This cam actuates a lever, M, through the medium of a roller or stud, *j''*, on the lever, which engages a groove in the cam. Lever M is fulcrumed at *k'* and its longer arm, *l'*, stands up normally just behind the anchor in the machine. When the cam L acts on the lever, the upper end, *l''*, of the latter is thrown suddenly forward and it strikes the anchor and pushes or knocks it sidewise from its resting place on the dies. The lever then returns to its normal position. In practice I prefer to employ a

lever, L, with two upright arms, *l'*, at some distance apart, as this applies the blow to two points on the body of the anchor simultaneously and effects a better result, especially when the anchor is quite long.

In order that anchors of different lengths may be made on one machine I prefer to provide means for setting the frame C^2, which carries the end-bender *e*, the foot *d'*, and their operating mechanisms at any desired point on the bed A, so that it may be set at the proper distance from die *c*. To effect this I mount the frame C^2 to slide longitudinally along the bed, preferably along guides in a well-known way to keep it properly aligned, and mount a pinion, *n'*, on the base of said frame, which pinion meshes with a suitable rack, *n'*, on the bed A. By rotation of this pinion the frame C^2 is moved to and fro lengthwise of bed A. When set at the proper point on the bed, the frame C^2 is securely clamped fast by bolts and nuts *o'*, the bolts playing along slots in the bed when the frame is moved.

In order to keep the bevel-gears b^4 in proper mesh, the gear-wheel on main shaft B is held in place by a key which engages a spline-groove or keyway in both the shaft and wheel, and by loosening this key the wheel may be moved into mesh with its mate on shaft B^5, and then again keyed fast.

In order to limit the movement of the spear *y* when it is pushed into place by pusher *t*, I mount on some part of frame C' a stop, *p'*, (seen in Figs. 1 and 2,) which stands in the path of said spear. The spear is pushed up to this stop.

The attendant takes the hot bar *x* and places it in the machine from the side—the right-hand side as seen in Fig. 2—placing the end that is to receive the spear on the nose of the closing-die *e'* and up against an end stop, *q'*. (Seen in Fig. 1.) The machine is now set in motion and the consecutive operations performed as hereinbefore described.

In order to avoid the danger of seriously damaging the machine in case it is set in motion at the wrong time, or while a spear or other obstacle lies in the hollow of die *c*, I prefer to form a hollow in slide *j*, as seen at *r'* in Fig. 1, back of the point where the plunger-die *f* is attached thereto. This reduces so much the strength of the metal to which said plunger-die is attached that said metal will yield and break should said die strike an obstacle before the machine will be injured.

I have herein referred to the feet, die, and bender as attached to their respective sliding plates, in order to avoid prolixity. In fact, they will usually be attached indirectly to said plates through intermediate pieces. This will be understood by any one skilled in the art. In some anchors the L-shaped bend is not required, in which case the bender *e* will of course not be employed.

Having thus described my invention, I claim—

1. The combination of a bed to support the mechanism, a die, *c*, thereon to support the end of the bar *x*, a reciprocating presser-foot, *d*, to hold the anchor-bar down while the work is being performed, a reciprocating plunger-die, *f*, to form the primary bend for the eye in the end of the anchor-bar, and the reciprocating closing-die *e'* for closing the eye in said bar, substantially as set forth.

2. The combination of a bed to support the mechanism, a support for the bar, the reciprocating presser-foot, as *d*, for holding the said bar down firmly while being operated on, and a twister for twisting said bar while thus held, said twister consisting of two reciprocating jaws which move in parallel planes simultaneously in opposite directions, substantially as set forth.

3. In a machine for making building-anchors, the combination of the hollowed die *c*, the reciprocating plunger-die *f*, the reciprocating presser-foot *d*, arranged to bear on the anchor-bar close to the hollow in die *c*, the anvil or support *c'* for the other end of the anchor-bar, the reciprocating presser-foot *d'*, and the reciprocating end-bender *e*, said foot *d'* serving to hold down the bar while the bend is being made, as set forth.

4. The combination, with the bed to support the mechanism, of the hollowed die *c*, on which the end of the bar *x* rests, the reciprocating foot *d*, to hold the bar down upon said die, the trough-like receiver *s'*, for the spear, aligned properly with the die *c*, as described, the reciprocating pusher *t*, aligned with and guided in said receiver, and a reciprocating closing-die, *e'*, adapted to close the eye in said bar when the spear is in place, substantially as set forth.

5. In a machine for making building-anchors, a twister for twisting the body of the anchor, comprising two reciprocating jaws, as g' g^2, which move in parallel planes simultaneously in opposite directions, substantially as set forth.

6. The combination, with the shaft B^3, of the slides K and K', mounted in guides and adapted to play in parallel planes, the jaws g' and g^2 on the respective slides, the cams h' and and h^2 on shaft B^3, which impart a reciprocating movement to slide K, and the cams i' and i^2 in the shaft B^3, which impart a reciprocating movement to slide K'; said slides moving in opposite directions simultaneously, substantially as set forth.

7. The combination, with the machine-bed, the supports for bar *x*, and the shaft B^3, of the device for discharging or pushing off the finished anchor, said device consisting of the cam L, the lever M, fulcrumed at *k'*, and the upright arm *l'* of said lever, said arm being arranged to cross the space between said bar-supports in its vibrations, substantially as set forth.

8. The combination, with the machine-bed, of the frame C^2, mounted in guides thereon, the rack and pinion for effecting the movement of said frame mounted on the bed and frame, respectively, the main shaft B, having a sliding

bearing in said frame, the shaft B^5, mounted in the said frame, the gears b^4, the slides p m, mounted in guides in said frame, the bender e, attached to slide p, the foot d', attached to slide m, the cams n o q r on shaft B^5, for operating said slides, and the anvil or support c' for the bar x, carried by frame C^2, substantially as set forth.

9. The combination, with the bed and the frame C', of the shaft B^4, mounted in said frame, the slides g and j, mounted in guides in said frame, the cams h i k l on shaft B^4, for operating said slides, the plunger-die f, attached to slide j, the presser-foot d, attached to slide g, and the die c, carried by frame C', substantially as set forth.

10. The combination, with the trough-like receiver s' for the spear y, of the guided pusher t, longitudinally aligned with and adapted to play in said receiver, the lever F, fulcrumed at u and coupled at its upper end with pusher t, the slide-bar v, coupled at its lower end to said lever F, and the cam G, provided with a groove engaged by a stud or roller, w, on rod v, substantially as set forth.

11. The combination, with the hopper E, having inturned ends s s, of the trough-like receiver s' at the bottom of said hopper to receive the lower spear of the series, as set forth.

12. The combination, with the slide j, provided with a hollow or recess, r', at its lower end, of the plunger-die f, secured to said plate below said recess, whereby the metal back of said die is weakened, for the purposes set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JACOB RUSSELL.

Witnesses:

HENRY CONNETT,

J. D. CAPLINGER.