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J. S. DETRICK.

MACHINE FOR MAKING WIRE HANDLES.

No. 371,492. Patented Oct. 11, 1887

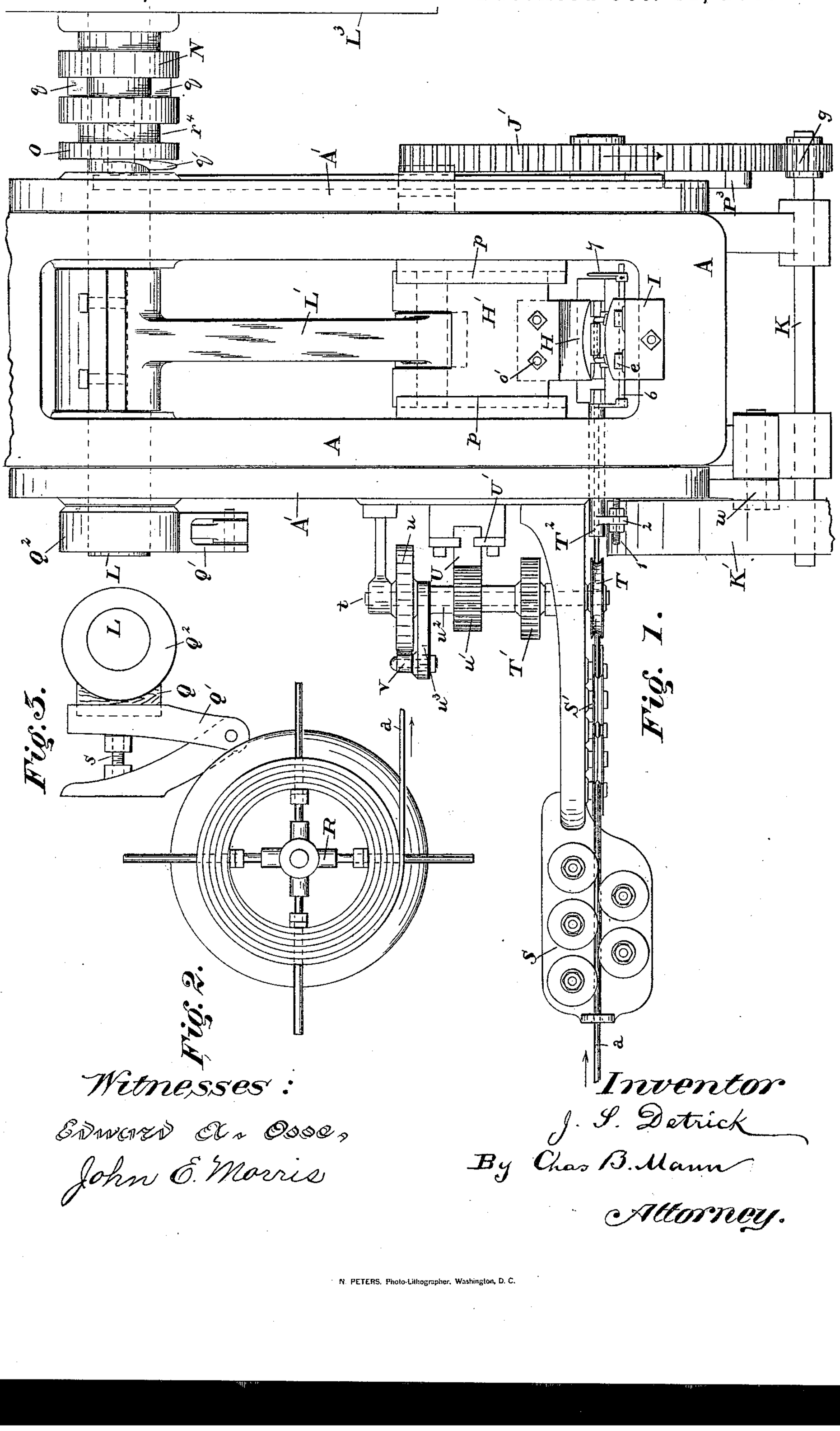

Fig. 1.

Fig. 2.

Fig. 3.

Witnesses:

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John E. Morris

Inventor

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(No Model.) 5 Sheets—Sheet 2.

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Fig: 4.

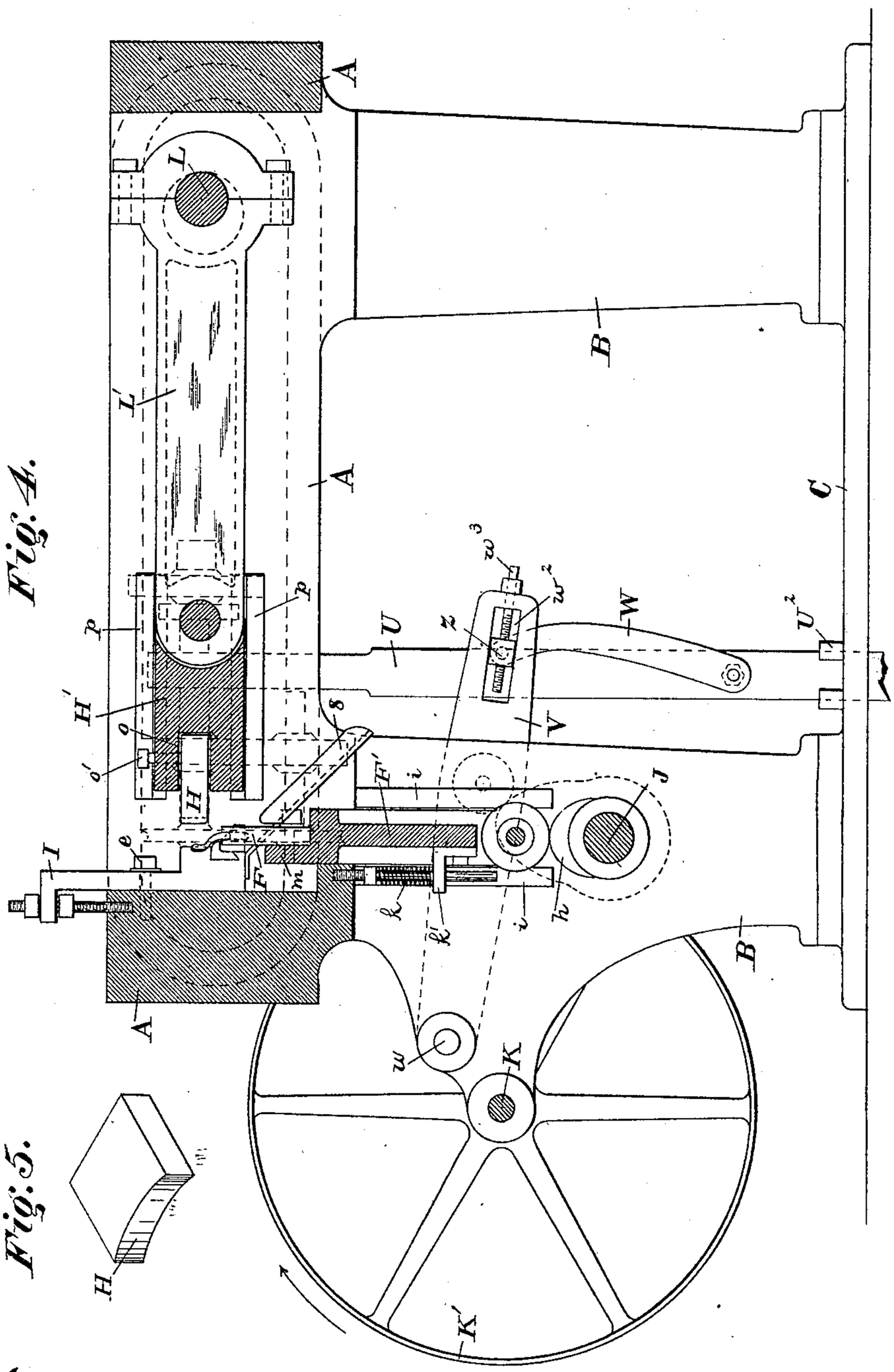

Fig: 5.

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(No Model.) 5 Sheets—Sheet 3.

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Fig. 6.

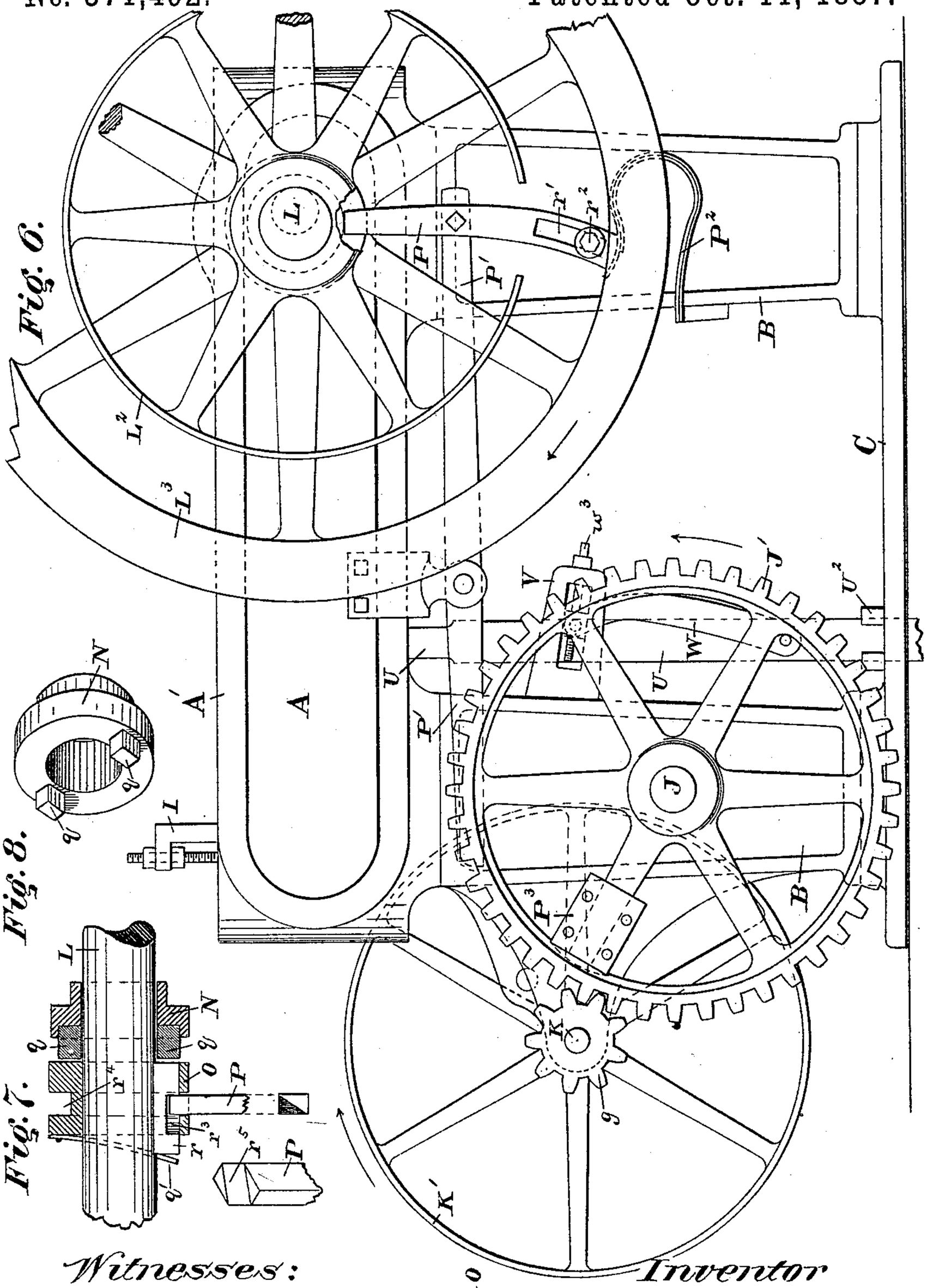

Fig. 8.

Fig. 7.

Witnesses:

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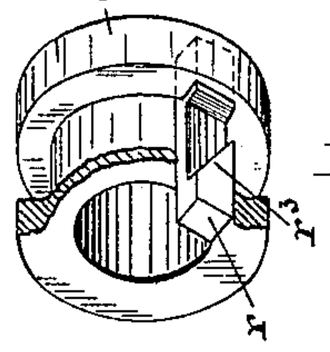
Fig. 9.



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(No Model.) 5 Sheets—Sheet 4.

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MACHINE FOR MAKING WIRE HANDLES.

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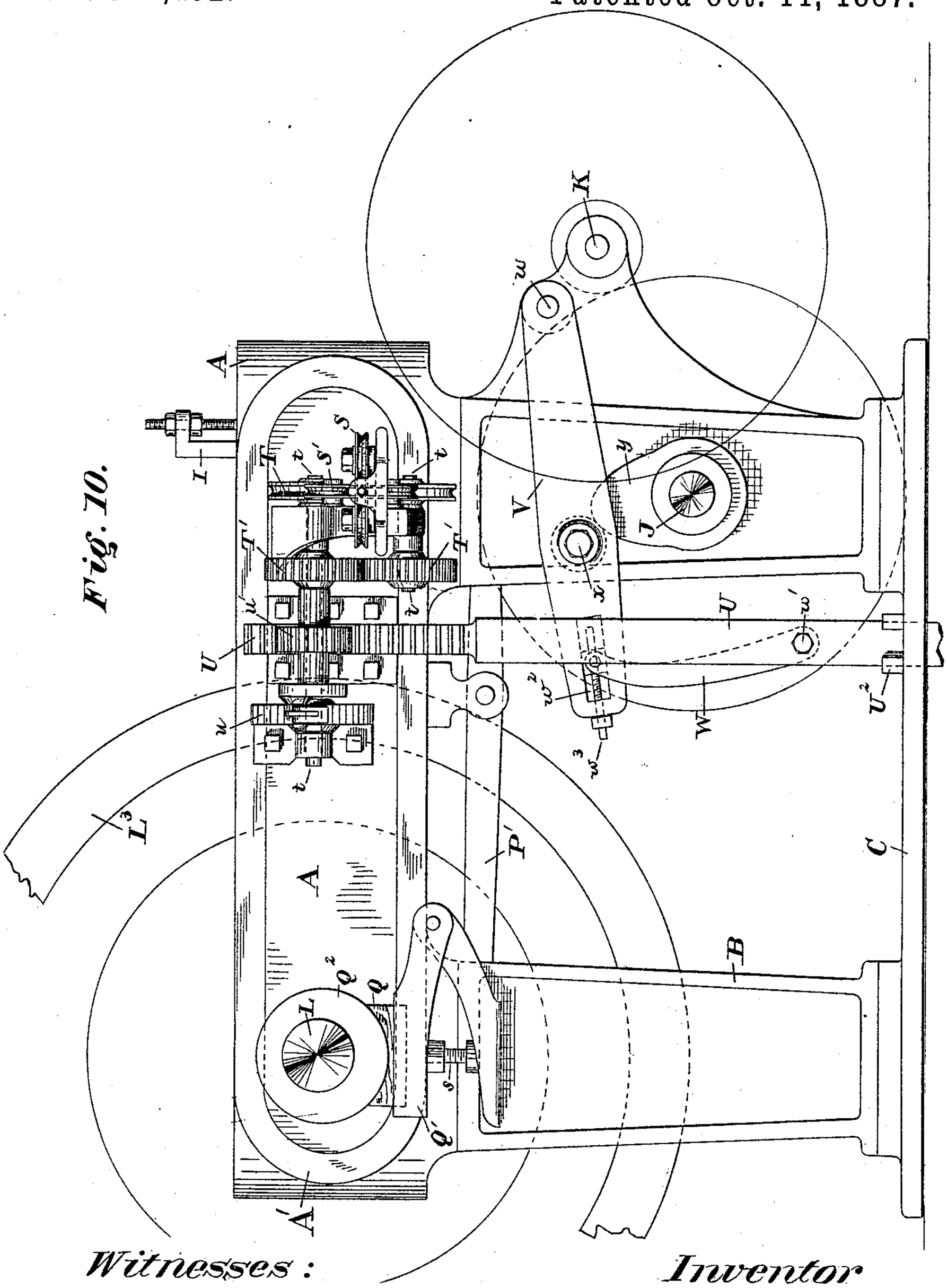
Fig. 10.



Witnesses:

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(No Model.) 5 Sheets—Sheet 5.

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MACHINE FOR MAKING WIRE HANDLES.

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Fig. 11.

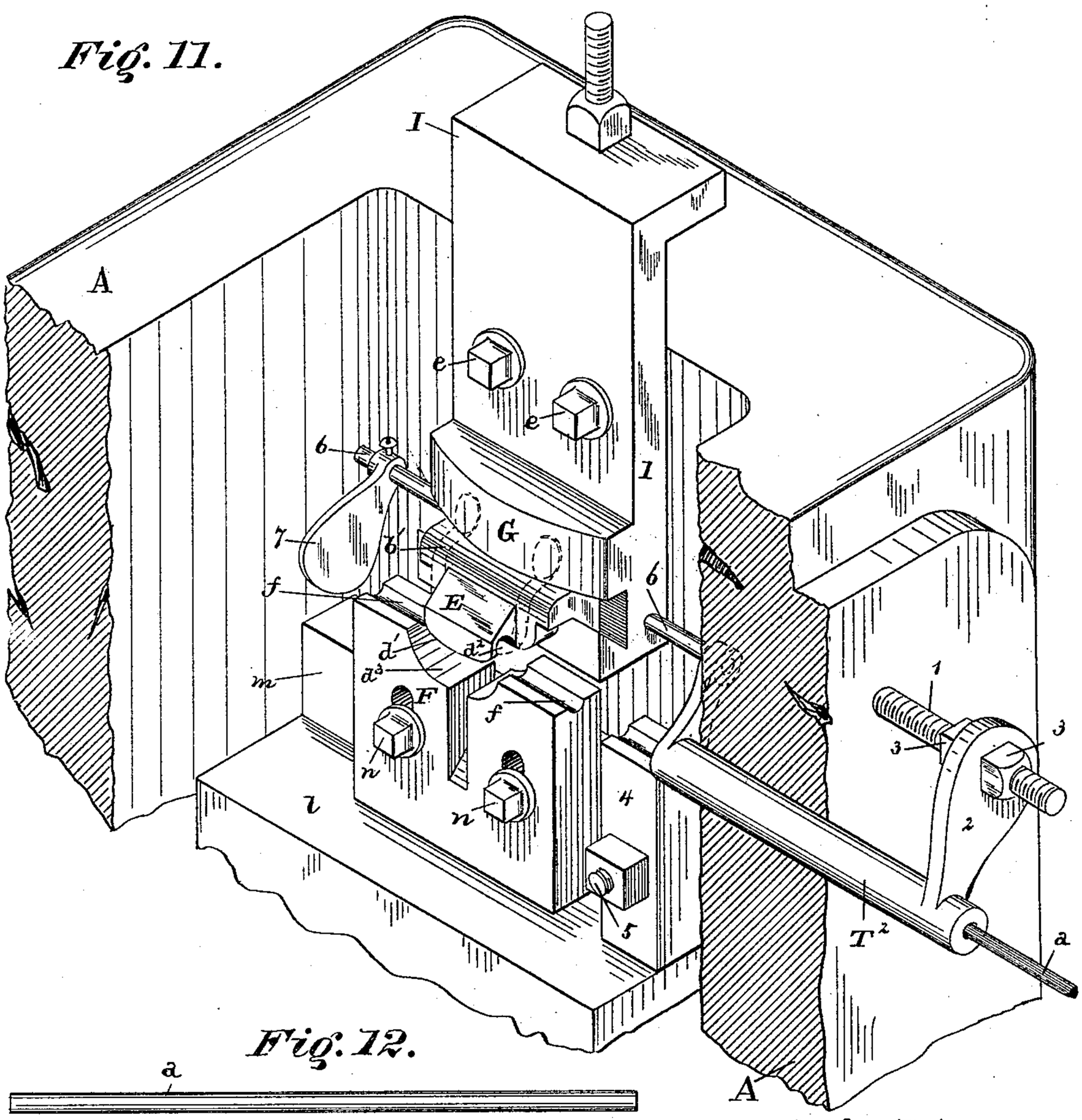


Fig. 12.

Fig. 14.

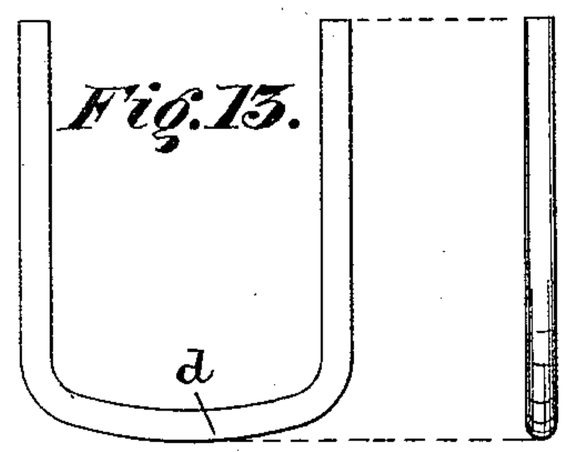
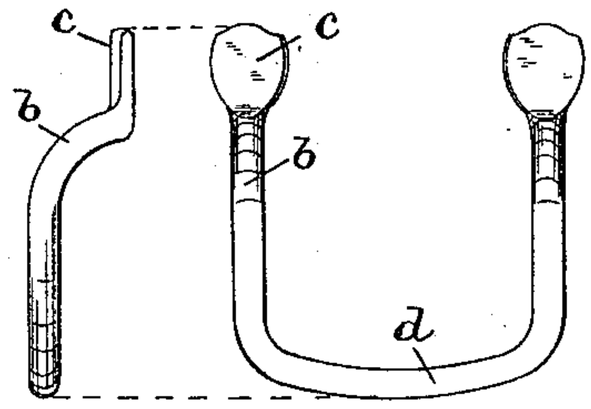


Fig. 13.



Witnesses:

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John E. Morris

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UNITED STATES PATENT OFFICE.

JACOB S. DETRICK, OF BALTIMORE, MARYLAND, ASSIGNOR TO MATTHAI, INGRAM & CO., OF SAME PLACE.

MACHINE FOR MAKING WIRE HANDLES.

SPECIFICATION forming part of Letters Patent No. 371,492, dated October 11, 1887.

Application filed March 14, 1887. Serial No. 230,785. (No model.)

To all whom it may concern:

Be it known that I, JACOB S. DETRICK, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Machines for Making Wire Handles for Sheet-Metal Ware, of which the following is a specification.

This invention relates to a machine for making loop-shaped handles, such as are used for dish-pans, colanders, saucepans, and the like. Handles of the kind referred to are made of heavy wire, and, besides being bent to the desired shape, must have their ends flattened and shaped ready for attachment to the vessel.

The invention is illustrated in the accompanying drawings, in which Figure 1 is a top plan of the machine. Fig. 2 is a top plan of the reel which holds the wire. Fig. 3 is a view of the brake device. Fig. 4 is a vertical longitudinal section of the machine. Fig. 5 is a view of the flattening-die H. Fig. 6 is a side elevation of the machine. Figs. 7, 8, and 9 are detail views of parts of the clutch device. Fig. 10 is an elevation of the side opposite that shown in Fig. 6. Fig. 11 is a section on a larger scale, showing the wire-cutting and a part of the handle-forming mechanism. Fig. 12 is a view of a straight piece of the wire cut and ready to be formed into a handle. Fig. 13 shows two views illustrating the wire as bent by the first action of the machine to form the handle. Fig. 14 shows two views illustrating the result of the second action of the machine in forming the handle, whereby the ends are flattened and the final shape given it.

In forming the handles the straight wire *a* is first bent to a U shape, as seen in Fig. 13, by the action of a pair of dies, and while these dies are still gripping the U-shaped wire another pair of dies produce the curve *b* and the flat ends *c*, and also imparts thereto any desired twist. The part *d* serves as the hand-grasp. My invention relates to the organization in a machine of certain parts and mechanism for operating the aforesaid dies.

The letter A designates a rectangular cast-metal frame having a horizontal position and supported on legs B, which rest on a base, C. At each side this frame is strengthened by oblong steel or wrought-iron hoops A′. The dies are supported and moved in this frame. The two dies E and F impart the U shape to the wire, and the dies G and H curve and flatten the ends, and also give the flat ends a slight twist, as shown in Fig. 14, whereby they will fit properly against the outer side of a circular vessel.

The dies E and G are fixed to a suitable bar or shank, I, which is stationary. The die E has a bottom curved face, d', which is provided with a groove, d^2, extending in the direction of or with the curve of said face. This curved groove forms the inner curve of the hand-grasp *d* of the handle. The die G comprises a block with a rounded or outward-curved face corresponding to the segment of a circle. The plane of the curved face of this die G is at right angles with respect to the plane of the grooved face d' of the die E, and it is on this curved face G that the ends *c* of the handle are flattened. Between the dies E and G is an outward-curved shoulder, b', whereon are formed the curves *b* of the handle, which are adjacent to the flat ends *c*. The bar or shank I, which holds the stationary dies E and G, is rigidly secured to the frame A by bolts *e* or other suitable means.

The die F is movable, and is the counterpart of the stationary die E. The die F has at its top a center concave curve, d^3, which forms the outer curved part of the hand-grasp *d*, and at each side of the said center curve is a straight horizontal face provided with a groove, *f*. When the straight piece of wire *a* is in position above the groove *f* on the top of the movable die F, it will be bent to the U shape by an up movement of said die. When the die F has moved up, and the straight wire has thereby been bent to a U shape, the dies E and F continue to hold the bent wire, while the exposed ends of said wire are acted on by other dies, now to be described.

The die H is movable, and is the counterpart of the stationary die G—that is to say, it has a concaved face corresponding to the outward-curved face of said die G. The dies G and H act on the exposed ends of the U-shaped wire, which they flatten, as at *c*, and near the flat part curve, as at *b*.

The foregoing description of the dies is necessary to a proper understanding of the machine.

A cam-shaft, J, is mounted in bearings in the two front legs, B, and at one end has a gear-wheel, J′, which gears with and is driven by a pinion, *g*, on a shaft, K, which carries a drive-pulley, K′, whereby motion is imparted to this mechanism. The shaft J has a cam, *h*, which raises the carrier F′ of the movable U-shaped die F. This die-carrier F′ slides up and down in suitable vertical guides, *i*. As already stated, it is forced up by the action of the cam *h*, and is forced down by the action of a spring, *k*, bearing on an arm, *k′*, projecting from the carrier. The top of the die-carrier F′ has a seat and a flange, *m*, projecting up at one side of the seat. The movable U-die F rests upon the said seat *l*, and is secured by bolts *n*, passed through the die into the said flange *m*.

A carrier, H′, has a socket, *o*, to receive the flattening-die H, which is secured by bolts *o′*. This die-carrier is fitted in horizontal guides *p* in the rectangular frame A. An eccentric-shaft, L, is mounted in bearings at the rear end of the frame, and a rod, L′, connects the carrier H′ with said eccentric-shaft. The rotation of the eccentric-shaft therefore causes the die-carrier H′ to reciprocate horizontally. This eccentric is driven by a pulley, L^2, secured to a balance-wheel, L^3, both of which turn freely on the said eccentric-shaft L. A clutch device is on this shaft, and serves to couple the balance-wheel with the shaft. This clutch is shown in Figs. 1, 7, 8, and 9. The balance-wheel L^3 has a hub, N, which is provided with two side lugs, *q*. The eccentric-shaft L has a hub, O, keyed fast to it. This hub O has a slide-bolt, *r*, which is movable back and forth in a slot formed in the hub and in a line parallel with the shaft. This slide-bolt *r* may be moved forward toward the balance-wheel hub N, and thereby engage with one of its lugs *q*, or may be moved back, as in Fig. 7, and thereby be disengaged.

An upright arm, P, is attached to a lever, P′, and has a vertical slot, *r′*, which is occupied by a bolt, r^2, projecting from the side of one leg B. The bolt r^2 serves to steady and guide the upright arm as it moves up and down. A spring, P^2, below the upright arm presses the latter normally upward. The lever P′, attached by one end to the said upright arm, extends to and its free end has position alongside of the wheel J′, and said wheel has a side projecting arm, P^3, which at each revolution comes up against the free end of the said lever, and thereby raises it, and this movement of the lever draws the upright arm P down. The upper end of the upright arm P, while pressed upward, engages with the slide-bolt *r* and retains or holds it back, and when said upright arm is drawn down, and thereby released from the slide-bolt, a spring, *q′*, on the hub O presses the slide-bolt *r* forward, causing it to engage with one of the lugs *q* on the revolving hub N, which engagement at once sets the eccentric-shaft in motion. In order that the upright arm P, when pressed upward, may readily engage with the slide-bolt *r*, the latter has a central cut-away, which at one side is inclined, as at r^3. The hub O has an exterior annular groove, r^4, and the upper end of the upright arm P has a beveled side, r^5. (See Fig. 7.) It will thus be seen that the bevel side r^5 of the upright arm will come against the inclined side r^3 of the slide-bolt *r* and retract it or draw it back. It will be understood that in operation the drive-pulley L^2 and balance-wheel L^3 are constantly revolving, while the eccentric shaft L rotates only when the slide-bolt *r* is in contact with a lug *q*.

The wheel J′, lever P′, upright arm P, connecting-rod L′, eccentric-shaft L, and the clutch just described constitute the connecting mechanism between the two movable or sliding dies F and H, whereby they are actuated in proper unison.

Any known form of clutch may be used in the above combination instead of the one here described.

From the foregoing description it will be seen that the rotary movement of the eccentric-shaft is intermittent. In order to check and stop its movement, a brake, Q, is provided. (See Figs. 1, 3, and 10.) The brake consists of a block, Q, on a pivoted arm, Q′. This block is in position to bear on an eccentric brake-wheel, Q^2, secured to the end of the eccentric-shaft L. An adjusting-screw, *s*, below the pivoted arm serves to support the latter at the desired position. As the brake-wheel Q^2 is eccentric, the brake-block Q will take effect on it only during about one-half of its revolution. The parts are so arranged that when the die-carrier H′ is being forced forward toward its counterpart G the brake will not at that time be applied; but upon the said die-carrier H′ beginning to move back, then the brake will take effect.

The wire *a*, from which the handles are to be made, is preferably coiled and supported on a reel, R, (see Fig. 2,) from which it passes to and through a set of straightening-rollers, and thence to the machine. Two series of straightening-rollers are employed. The first series, S, turn in a horizontal plane, and the second series, S′, turn in a vertical plane. A pair of feed-rollers, T, are located between the straightening-rollers and the machine. One feed-roller T is directly above the other, and each is mounted on a separate shaft, *t t′*, and the two shafts have connected gear-wheels T′, whereby the two feed-rollers have a positive geared motion. Intermittent movement is imparted to the two feed-rollers T, each movement being sufficient to feed a length of wire long enough to make a handle. The parts of this intermittent feed motion consist of a ratchet-wheel, *u*, keyed fast on the upper feed-shaft, *t*, and pinion *u′*, loose on said upper feed-shaft. The pinion *u′* has a hub, u^2, to which an arm,

w^3, is attached. This arm w^3 is alongside of the ratchet-wheel u, and carries at its end a spring-pawl, v, which engages with the teeth on said ratchet-wheel. A rotary forward and back motion of the loose pinion u' throws the pawl-arm w^3 first forward and then back, whereby the ratchet-wheel u and both feed-rollers T have only a forward movement, which movement is intermittent. The means for imparting a rotary forward-and-back motion to the loose pinion u' comprises the following parts: a vertical rack-bar, U, which is engaged with the said loose pinion and is fitted in upper and lower guides, U' and U^2, so as to slide therein up and down. A vertical reciprocating movement is given to this rack-bar by a lever, V, pivoted to a fixed standard at w, and connected with the said rack-bar by a link, W, which is pivoted to the rack-bar at w'. The lever is provided with a friction-roller attached by a bolt, x, and a cam, y, on the lower shaft, J, bears on the said friction-roller and raises the lever. The gravity of the parts is sufficient to lower the rack-bar. As the extent of movement of the rack-bar determines the length of the wire which is fed to the dies by each movement of the feed-rollers T, it is important to be able to regulate the movement of said rack-bar. This is done by an adjustable connection between the link W and lever V, whereby the connecting-pivot z may be placed nearer to or more remote from the lever-pivot w. Obviously the nearer to the lever-pivot w the link-connecting pivot z is placed the shorter will be the up-and-down movement of the rack-bar. In the drawings the free end of the lever V has a longitudinal slot, w^2, and the connecting-pivot z is attached to a block which is movable in the said slot. A screw-bolt, w^3, regulates the position of the pivot-block. It will thus be seen the connecting-pivot z is adjustable lengthwise on the lever.

A suitable opening is necessary in the side of the frame A for the entrance of the wire a from the feed-rollers T to the dies. I provide an adjustable feed-tube, T^2, which passes horizontally through an opening in the side of the frame A. This tube may be moved endwise, so that its end which is within the frame may project more or less inward beyond the frame-wall. A screw-threaded bolt, 1, has one end rigidly secured in the side of the frame A, and projects therefrom parallel with the feed-tube, the outer end of which has a lateral arm, 2, provided with a hole. The said projecting bolt 1 occupies the said hole, and thereby the lateral arm is movable along the bolt. Two jam-nuts, 3, on the said bolt—one each side of the lateral arm 2—retain the arm and consequently the feed-tube wherever set. The feed-tube T^2 must be adjusted in connection with the shear-plate 4, in order to cut the proper length of wire for the particular sized handle that the machine may be set to make. The shear-plate 4 sets on the die-carrier seat l, and a bolt, 5, secures it to the flange m.

It will be readily understood, though not shown in the drawings, that if the bolt 5 passes through a horizontal slot in the flange m the shear-plate 4 may, by loosening and tightening the said bolt 5, be laterally adjusted toward or away from the die F. Both the feed-tube T^2 and the shear-plate 4 must be adjusted alike, so as to preserve the same relative position with respect to each other, it being understood that the cutting of the wire is done by the shear plate passing up close alongside of the inner end of the feed-tube.

A rod, 6, passes horizontally through the lower part of the shank I, and a stop-plate, 7, has one end adjustably secured on said rod, and the other end projects to a position opposite the end of the feed-tube, whereby when the feed-rollers T force the wire a through the feed-tube and between the dies E and F the end of the said wire will come in contact with the said stop-plate 7, whereupon the latter will prevent the admission of any more wire.

By means of the adjustable feed-tube T^2, shear-plate 4, and stop-plate 7, several different lengths of wire may be cut to suit as many different sizes of handles. The several dies may also be readily changed for others of the same kind, larger or smaller, and thus the one machine is adapted to make several handles of different sizes.

An inclined delivery-slide, 8, receives the finished handle as it drops from the die upon the carrier F' moving down.

Having described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a machine for making wire handles, the combination of two stationary dies, E G, a vertical slide, i, a horizontal slide, p, a carrier, F', in the vertical slide, surmounted by a die, F, a carrier, H', in the horizontally-moving slide, having a die, H, and connecting mechanism, whereby the two movable or sliding dies are actuated in proper unison, for the purpose set forth.

2. In a machine for making wire handles, the combination of two stationary dies, E G, a vertical slide, i, a horizontal slide, p, a carrier, F', in the vertical slide, surmounted by a die, F, a shaft having a cam, h, which raises the vertically-moving carrier, a carrier, H', in the horizontal slide, having a die, H, an eccentric-shaft, L, and a rod, L', connecting the horizontally-moving carrier with the eccentric-shaft, for the purpose set forth.

3. In a machine for making wire handles, the combination of two stationary dies, E G, a vertical slide, i, a carrier, F', in the vertical slide, having at its top a seat, and a flange, m, projecting up at one side of the seat, a U-shaped die, F, secured on said seat, a horizontal slide, p, a carrier, H', in the horizontal slide, having in its end a socket, o, and a flattening-die, H, secured in said socket, for the purpose set forth.

4. In a machine for making wire handles, the combination of two dies, E G, a vertically-

moving carrier, F′, surmounted by a die, F, a horizontally-moving carrier having a die, H, an eccentric-shaft, L, a rod, L′, connecting the horizontally-moving carrier with the eccentric-shaft, and mechanism, substantially as described, connecting the vertically-moving carrier and eccentric shaft.

5. In a machine for making wire handles, the combination of two dies, E G, a vertically-moving carrier surmounted by a die, F, a drive-shaft and pulley, K′, to impart movement to said vertically-moving carrier, a horizontally-moving carrier having a die, H, an eccentric-shaft, L, a rod, L′, connecting the horizontally-moving carrier with the eccentric-shaft, a drive-pulley, L^2, loose on the eccentric-shaft, a clutch to couple the said eccentric-shaft and drive-pulley, and mechanism, substantially as described, to operate the clutch, whereby the drive-pulley on the eccentric-shaft will impart to the latter an intermittent rotary movement.

6. In a machine for making wire handles, the combination of two dies, E G, a vertically-moving carrier surmounted by a die, F, a horizontally-moving carrier having a die, H, an eccentric shaft, L, having an intermittent rotary movement and connected with the horizontally-moving carrier, and an eccentrically-acting brake, Q Q^2, for the purpose set forth.

7. In a machine for making wire handles, the combination of two dies, E G, a vertically-moving carrier surmounted by a die, F, a drive-shaft and pulley, K′, to impart movement to said vertically-moving carrier, a wheel, J′, on said drive-shaft, and provided with a side projecting arm, P^3, a horizontally-moving carrier having a die, H, an eccentric-shaft, L, a rod, L′, connecting the horizontally-moving carrier with the eccentric-shaft, a drive-pulley, L^2, loose on the eccentric-shaft, a clutch to couple the said eccentric-shaft and drive-pulley, a lever, P′, having one end in position to be actuated by the said side projecting arm, and provided at the other end with an arm, P, which engages with the said clutch, for the purpose set forth.

8. In a machine for making wire handles, the combination of a wire-reel, R, two series of straightening-rollers, each series turning in a plane at right angles with the other, feed-rollers on shafts which are geared together, and mechanism, substantially as described, for imparting to the feed-rollers a forward intermittent movement, as set forth.

9. In a machine for making wire handles, the combination of the feed-rollers, a rack-bar, U, which has a reciprocating movement for imparting intermittent motion to the feed-rollers, a lever, V, and a link, W, having one end pivoted to the rack-bar and the other end attached to the said lever by an adjustable connection, *z*, for the purpose set forth.

10. In a machine for making wire handles, the combination of a die, E F, to impart to a piece of straight wire a U shape, one part of said die being stationary and one movable, a carrier for the movable part of the die, and a shear-plate secured on the said carrier, for the purpose set forth.

11. In a machine for making wire handles, the combination of an adjustable feed-tube, through which the wire is fed, a reciprocating carrier, and an adjustable shear-plate secured on the said carrier, for the purpose set forth.

12. In a machine for making wire handles, the combination of an adjustable feed-tube, through which the wire is fed, an adjustable stop-plate, 7, and an adjustable shear-plate, 4, at the inner end of said feed-tube, for the purpose set forth.

13. In a machine for making wire handles, the combination of an adjustable feed-tube, through which the wire is fed, an adjustable stop-plate, 7, an adjustable shear-plate, 4, at the inner end of said feed-tube, feed-rollers having intermittent motion, and mechanism, substantially as described, to move said feed-rollers to an extent corresponding with the adjustment of the said feed-tube, stop-plate, and shear-plate, as set forth.

14. In a machine for making wire handles, the combination of a die to bend the wire to a U shape and then hold said wire while it is acted on by other dies, and dies to flatten the ends of the said U-shaped wire while it is held by the first pair of dies.

15. In a machine for making wire handles, the combination of U-shaping dies, one of which is stationary and one movable, and end-flattening dies, one of which is stationary and the other movable in a plane at right angles with respect to the movable U-shaping die first mentioned.

16. In a machine for forming handles, the combination of U-shaping dies E F, one of which is fixed to a bar or shank, and end-flattening ends G H, one of which is fixed to the same bar or shank which holds one of the said U-shaping dies, as set forth.

17. In a machine for forming handles, the combination of two stationary dies, E G, a slide, *i*, a slide, *p*, extending in a direction at right angles with respect to the slide first mentioned, and a carrier and die moving in each slide and each moving die acting on a different one of the said stationary dies.

In testimony whereof I affix my signature in the presence of two witnesses.

JACOB S. DETRICK.

Witnesses:
JOHN E. MORRIS,
JNO. T. MADDOX.