

June 22, 1937.

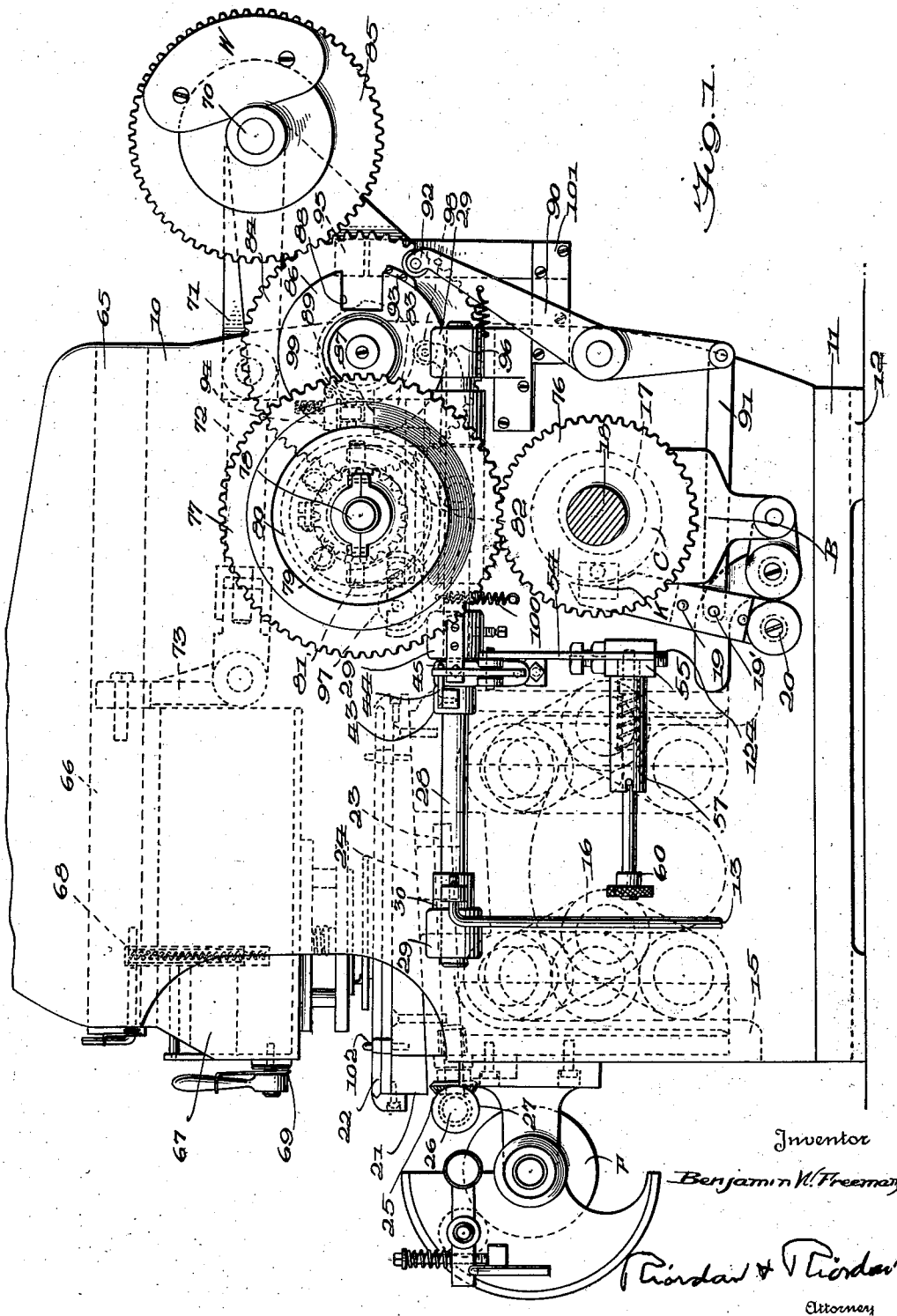
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2,084,335

ORNAMENTING MACHINE

Original Filed Nov. 19, 1934

5 Sheets-Sheet 1



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5 Sheets-Sheet 2

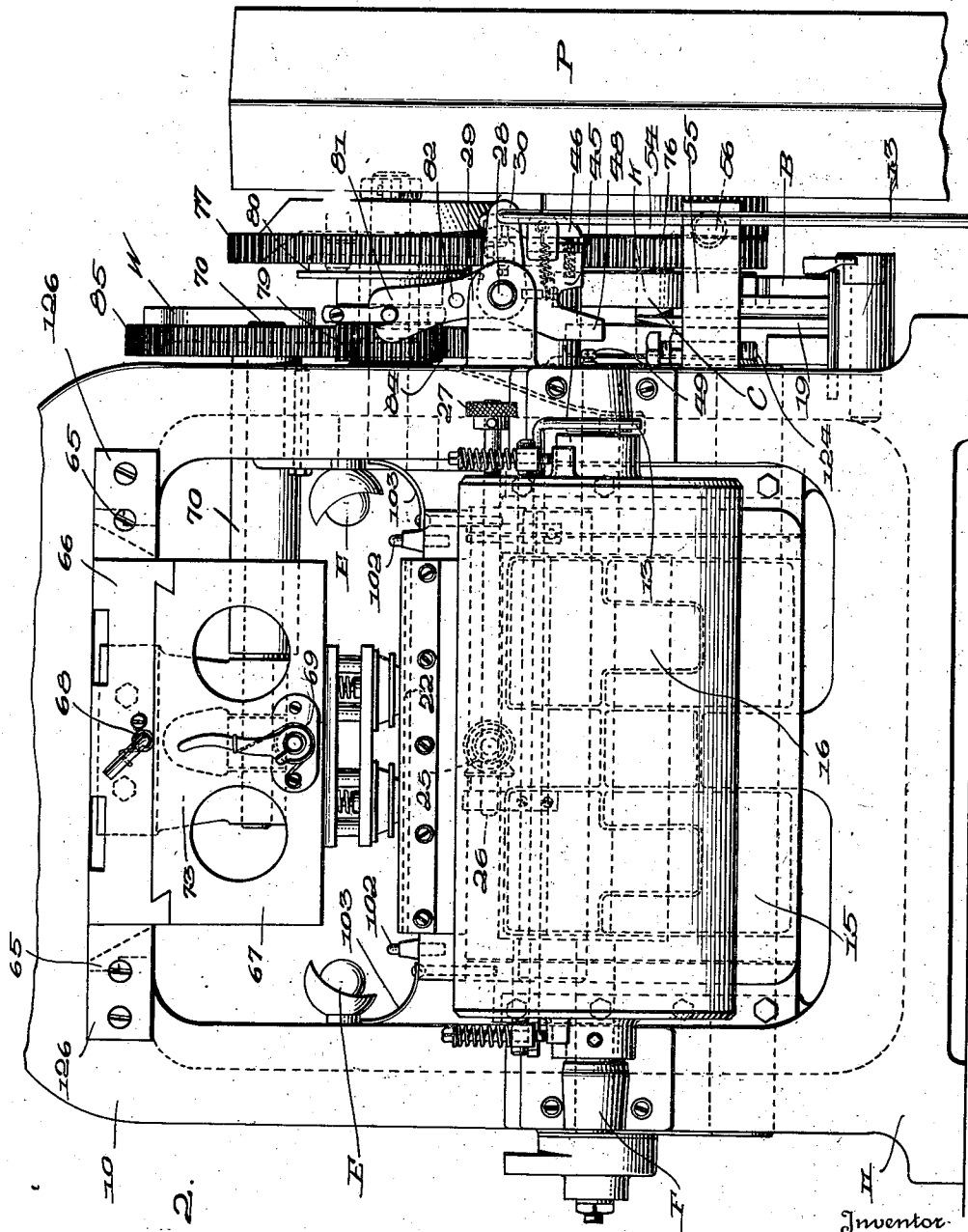


Fig. 2.

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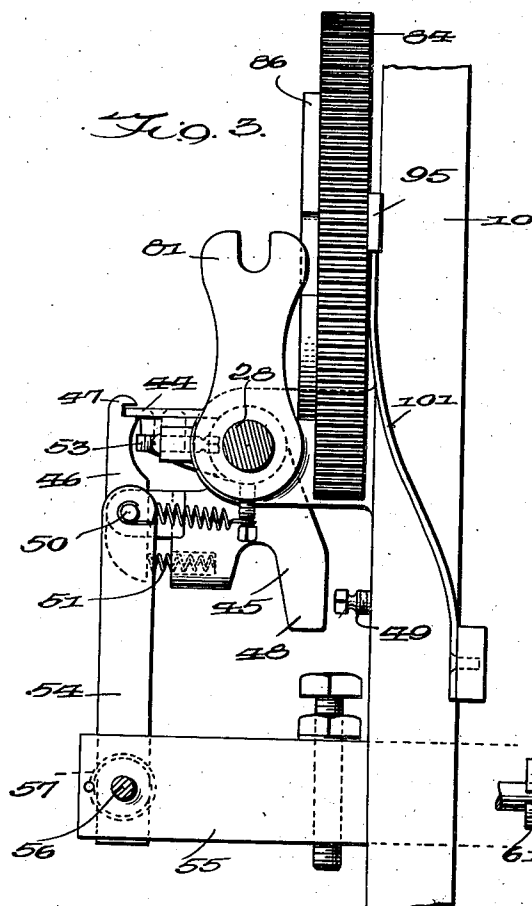
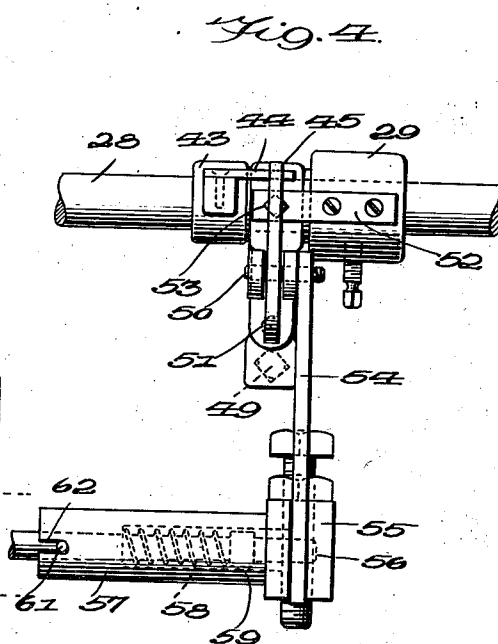
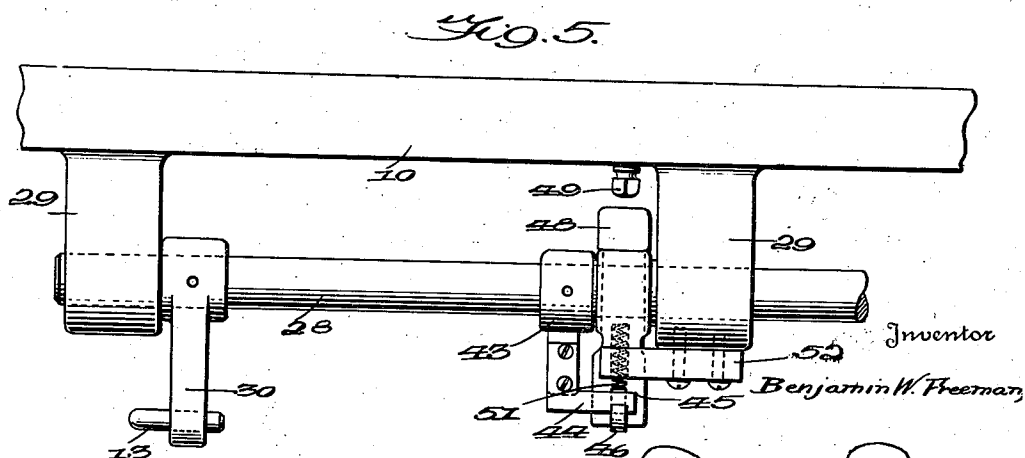
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5 Sheets-Sheet 3



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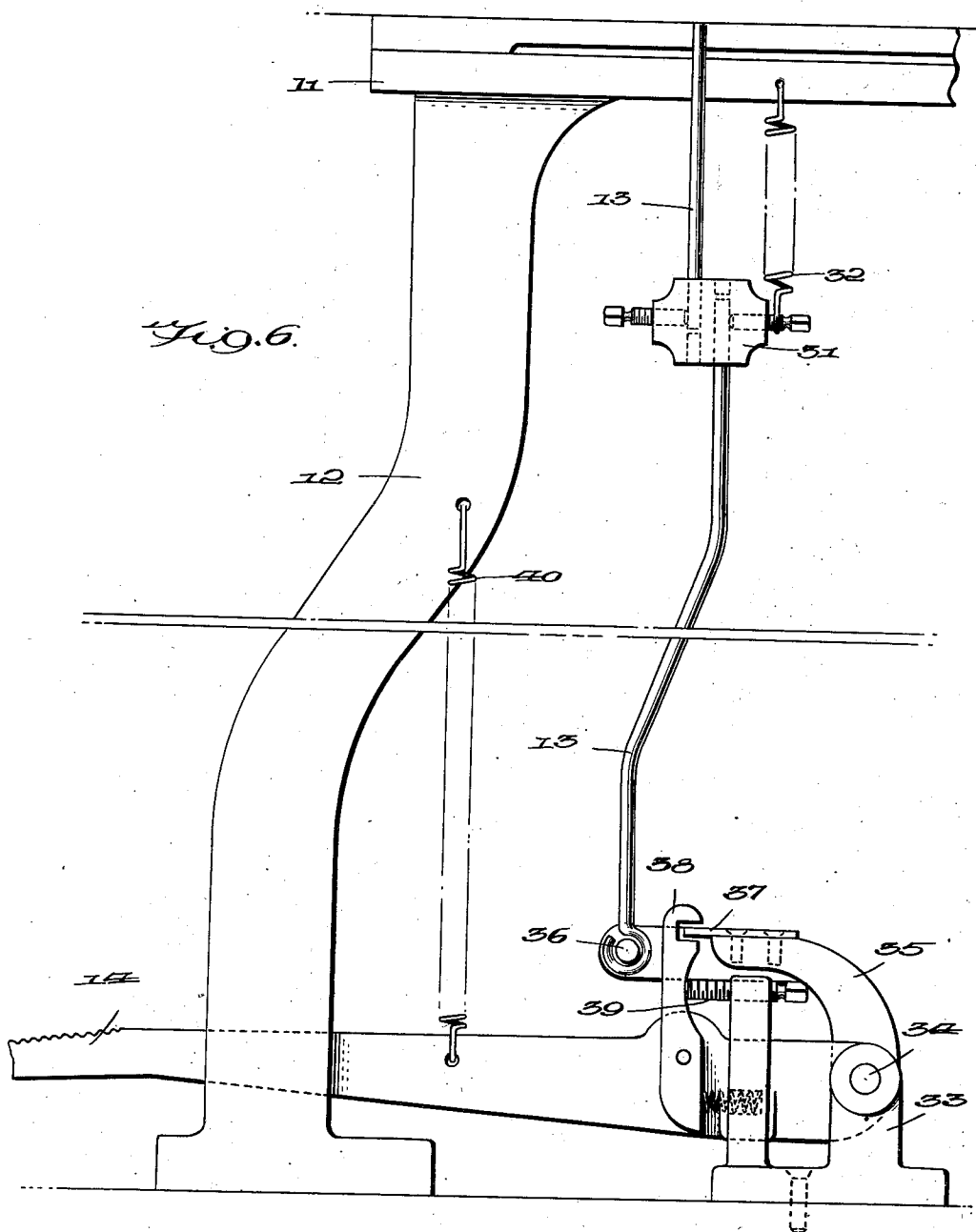
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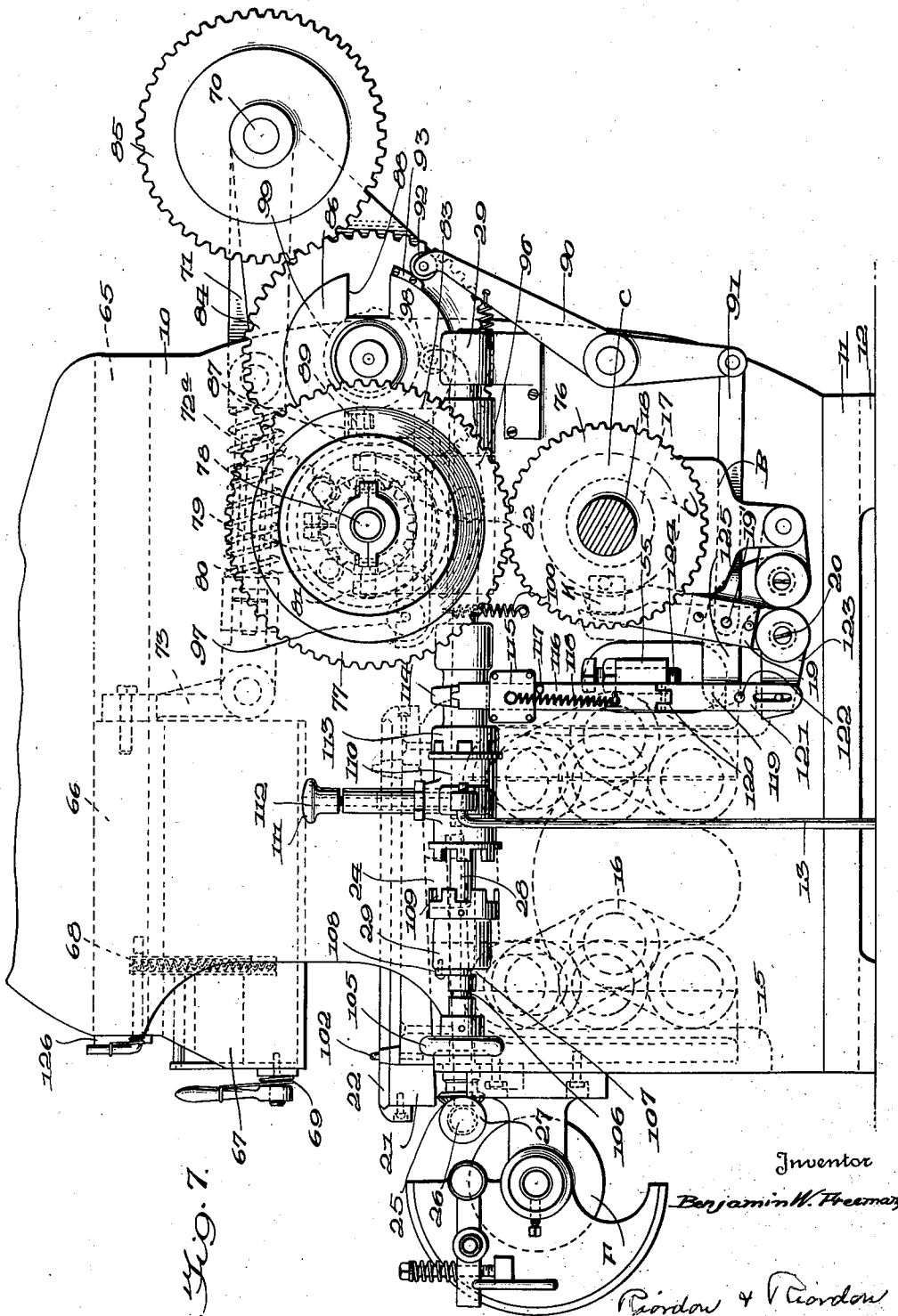
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ORNAMENTING MACHINE

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UNITED STATES PATENT OFFICE

2,084,335

ORNAMENTING MACHINE

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Application November 19, 1934, Serial No. 753,766

Renewed July 13, 1936

40 Claims. (Cl. 101—287)

The present invention relates to machines for the use in the manufacture of boots and shoes, and more specifically to combined marking and cutting machines adapted for operation upon skins, upper blanks, fitted or closed uppers and the like, in which the work is marked with ink, pigment or the equivalent at the same time, or as part of a cycle of operations during which the work is also ornamented by perforating or cutting out a design therein.

More particularly this invention relates to improvements upon devices and machines for accomplishing such work, as described and claimed in my Patents Nos. 1,990,592; 1,990,595; 1,990,597, and 1,990,598 all dated February 12th, 1935 and to which reference is hereby made.

These machines are of a type intended for use as "universal" cutout and marking machines particularly intended for work on shoes, leather and shoe materials and where the work is of a widely varying contour and design, the machines being adapted to operate not only upon flat material, but also to perform operations on other than flat work, such as closed and fitted uppers or other types of ring-like work.

Among the objects of the invention are the formation of ornamental designs in the work by the application of a stamped or printed marking, which may simulate stitching or may take the form of a design, by the production of ornamental cutouts in the work or by combinations of both marked and perforated designs, and in marking and cutting simultaneously or during a continuous cycle of operations.

Another object contemplates the application of markings to the work which may be used as a guide for subsequent operations such as stitching or aligning the shoe parts with respect to the marked part.

Still another object resides in the provision of a marking device which may function as a stripper in addition to its marking functions, or a stripper arranged to function as a marking device in addition to its function of stripping the work from the die.

Various safety mechanisms ensuring a predetermined cycle of operations and designed to prevent injury to an operator or to the work by preventing premature or inaccurate cutting operations form a feature of this invention.

In a preferred embodiment of the invention illustrated herein, there is disclosed a machine having a power driven plunger movable through a relatively vertical plane, the plunger serving to

mount a work support on which the work may be positioned. A suitable backing medium of paper or its equivalent will be provided between the work and the support. In order to properly align, gage and position the work relative to the operating position of the marking and cutting dies, gage abutments may be located on the work support, or a gaging mask might readily be utilized either in conjunction with or in lieu of such an abutment. Inasmuch as it is frequently desirable to clamp or hold the work in such aligned position, it is contemplated that a mask or clamp having no gaging function, may be provided, to cooperate with any desired type of gage, for this purpose.

An aim of the present invention is to provide a single control, as a treadle, for operating mechanism by means of which the die may be moved into an operating position, inked during its passage to such position, the main operating clutch of the machine released, the work support and operating plunger raised to effect an ornamenting operation, and the die thereafter moved to a position out of the way of an operator who is then free to remove the work from the machine.

Another object of the invention is the provision in an improved machine of the character described, of a die mechanism, which while movable into and out of operating position will be rigidly supported and backed up, for cooperation with a work supporting plunger which is so positioned as to at all times expose the upper surface of the work to full view of the operator.

Ornamenting machines, for forming cutouts in a work piece, for marking same or for effecting both operations are of course known, but these prior art machines are open to the objection that they cannot handle heavy work, or work of large size, being designed primarily to the treatment of comparatively small size or light work.

Merely increasing the size of the machine will not suffice to overcome this objection, in fact may result in such a cumbersome, heavy machine as to be impractical.

This objection is caused by several factors, one being movability of the die, which usually is arranged to move into and out of ornamenting relation to the work, and which because of inertia in the moving parts will rarely come to rest after an operation, at the same point, twice successively. The position of the die, at rest, however, should bear a definite relation to the mechanism which applies ink to the die, and hence the objection becomes important.

Another objection is caused by necessary clear-

ance, which must be provided between a vertically movable die and a relatively fixed work support, the purpose of the clearance being to facilitate removal of the die from the machine, fitting of the work into proper aligned position, inking of the marking elements on the die, etc. This clearance is quite substantial between the die and the work support, and necessitates therefor an operating stroke sufficient to carry the die or the work through such clearance to effect the ornamenting operation.

It is an important aim and object of the present invention to avoid these and other objections, and to this end the machine is designed in such a manner as to maintain always a predetermined relation between the die and the inking mechanism, e. g., the inker is substantially fixed with respect to the path of travel of the die, this being true whether the die has moved to an operative, an inoperative, or an intermediate position; and further to reduce the length of the operating stroke when ornamenting the work, with consequent saving in power, lessening of strain on the moving parts, and increased durability, as well as reduction in size of the machine.

Among the main or principal features of this machine are a substantial difference in the arrangement of parts over prior art machines which endeavor to obtain similar results, i. e., the work supporting plunger partakes of a movement toward and from the die, while the combined marking and cutting die unit remains fixed insofar as the plane of travel of the work support is concerned; the crank and driving connections heretofore mounted in the head or frame of the machine are located in the base thereof; the die partakes of a lateral movement from a position over the work support to an inner position and return for inking purposes; the usual frame enclosure is cut back and designed to offer as much freedom as possible to an operator reaching for the work; the parts are so synchronized and operate in such a sequence that the operator may remove the work immediately after the ornamenting operation, and before the die has been completely retracted. Where, in prior machines, it was essential from the standpoint of safety that the operator wait until all moving parts had come to rest, with the present apparatus, the operator may be handling the work in perfect safety even though the die is still moving to its inoperative position, insofar as cutting and marking are concerned.

In commenting upon the universal features of the machine it should be noted that this machine is readily adaptable to the self-contained, auxiliary type of die and paper feed mechanism, used in clicking machines, merely by the removal of its own die and die block, and the placement of such auxiliary mechanism upon the work support which will then act to press the auxiliary die with the work upon it, toward the head of the machine as a resistance or reaction member.

Further objects include the use of aligning mechanism for positioning the die and plunger in accurate relation to each other, such that should the die by any chance not be exactly aligned with the work on the work support, it will be automatically brought into alignment as the work support moves to ornamenting position; artificial illumination within the interior of the machine adjacent the work support, consistent relationship between the die and ink roll, i. e., no variation in the height of the die with respect to

the ink roll, and use of a relatively stationary ink applying mechanism.

To the attainment of the above and other objects which will appear as the description proceeds, reference may be made to the accompanying drawings, in which:—

Fig. 1 is a side elevation of a preferred form of the machine;

Fig. 2 is a front elevation thereof;

Fig. 3 is an enlarged end elevation of the die carriage control and actuating mechanism looking in the opposite direction from Fig. 2;

Fig. 4 is a face view of the mechanism shown in Fig. 3;

Fig. 5 is a plan view of details shown in Figs. 3 and 4;

Fig. 6 is an enlarged elevation of the treadle control details for initiating actuation of the machine; and

Fig. 7 is a view similar to Fig. 1, but illustrating a modified clutch and control mechanism.

Referring more specifically to the drawings, in which like reference numerals designate like parts, there will be seen a main frame or housing 10 having a sturdy base 11, which is carried by legs 12 of sufficient height to position the main frame conveniently to an operator. A treadle rod 13 extends to a treadle 14 and treadle mechanism (Fig. 6) below the base of the machine. At the forward part of the main frame 10 is a vertically reciprocable plunger 15 actuated by a four point toggle mechanism 16 which mechanism is connected to an eccentric 17 on a main power shaft 18. The shaft 18 is adapted for driving by a fly wheel pulley P which is connected to any suitable source of power.

The pulley P normally rotates freely and constantly on the shaft 18, until clutched thereto. A clutch C, comprising a clutch hub fixedly mounted on the shaft 18 in slightly spaced relation to the hub of pulley P, is peripherally grooved, to form a channel, and carries a spring pressed key K, slidable axially of the shaft, across the channel and into engagement with a recess in the pulley hub. Normally, with the parts at rest, a clutch control lever 19 pivoted to the frame at 20 will rest with its tapered or wedge shaped end resting in the channel to hold the clutch key in a position disengaged from the recessed pulley hub. When suitably actuated as hereinafter described, the clutch key will be released to engage the pulley and clutch same to the shaft 18. The details of this clutch are quite similar to the main power clutch in each of the copending applications, above mentioned, and to which reference may be had if desired.

A brake B is provided for bringing the shaft 18, and associated parts to rest promptly, at the proper time in the cycle of operations, after such parts are declutched from the pulley, and the plunger has completed its movement.

The top of the plunger 15 slopes rearwardly, and mounted thereon with a corresponding slope to its underside, is a work support 21 which usually will be surfaced as at 22 with brass or other material softer than the cutting edges of the die. The sloping surface permits a slight relative adjustment of the height of the plunger with respect to the frame, and to that end a lead screw 23 threaded through a lug 24 is utilized, the forward end of the screw being connected by bevelled gearing 25 to an adjusting shaft 26 which is equipped with a handle 27 at one side of the machine.

Extending from front to rear along one side of the frame 10 is a control shaft 28, bearing lugs 29 being provided at spaced intervals to support the same.

The shaft 28 is capable of rocking in the bearings under the influence of the treadle rod 13, and to effect this movement an arm 30 is pinned to the shaft and connects same to the upper end of the treadle rod 13. The treadle rod, as shown in Fig. 6 is made adjustable in length by means of a coupling 31 and this coupling is connected by a spring 32 and the base portion 11 such that the rod will always be urged to return to normal position after movement under influence of the treadle 14, thereby tending to rock the shaft 28 back to its original position after an operating movement.

The treadle itself is supported on a shaft 34 carried by a bracket 33 which in turn is secured to the floor or to a leg 12. Also carried by the shaft 34 is an arm 35 connected at its end as at 36 to the lower end of the treadle rod 13.

Securely mounted on the arm 35 is a projecting plate or flange 37 which is designed to cooperate with the hooked end of a spring pressed latch 38, the latch being pivoted on the treadle 14. With this arrangement, when the treadle 14 is depressed, the spring pressed latch 38, through its engagement with the flange 37 will depress the arm 35 to pull down the treadle rod 13 and consequently rock the shaft 28.

In order to ensure that the machine will cease operations after a single cycle of revolution, even though the operator maintains the treadle 14 in a depressed position, the latch 38 is provided with a curved underside engageable with an adjustable cam finger 39. As the treadle is depressed, the cam finger 39 serves to kick the latch away from the flange 37 thus permitting the treadle rod 13 to rise under the influence of the spring 32, and obviously the rod cannot be pulled down again, until the treadle has been released and the latch 38 permitted to re-engage flange 37. A spring 40 serves to restore the treadle 14 to its original position.

Pinned to the shaft 28, in spaced relation to the arm 30 is a second arm or lug 43, which has secured to its outer end a toe-like element or flange 44 (Fig. 5).

Mounted for free movement on the shaft 28 adjacent the lug 43 is a control plate 45 which carries a spring pressed latch 46 terminating in a hook 47 designed to engage the flange plate 44.

The spring pressed latch 46 is pivoted at 50 to the plate 45 and is normally pressed into engagement with the flange plate 44 by spring 51. Secured to the adjacent bearing 29 is a strut 52 which carries an adjustable cam finger 53 located to engage the curved underside of the latch 46.

The plate 45 is provided with a finger 48 engageable with an adjustable stop screw 49 whereby movement of the plate may be adjustably limited.

Also pivoted on the pivot pin 50 is a link 54 which serves to connect the plate 45 to an arm 55, which is rigidly mounted on the plunger 15. The arm 55 carries an adjustable, brake actuating stud 124, engageable with an extension 125 of the brake B, to apply the brake as hereinafter described.

This connection is made detachable through the medium of a spring pressed plunger 55 operating in a cylinder 57 which also encloses the spring 58 working against a collar 59 on the plunger 56. The outer end of the arm 55 is

slotted to receive the link 54 and both the link and the arm are perforated to receive the end of the plunger 56. A handle 60 forms a convenient means of disengaging the plunger 56, and a cross pin 61 normally riding in a slot 62 in the cylinder 57 may be removed from such slot and by slight rotation of the handle, positioned to ride on the end of the cylinder, out of alignment with the slot, thereby serving to retain the plunger in a position where it will not connect the link 54 to the arm 55.

Formed in the head of the frame 10 is a track 65, and mounted for sliding movement therein is a die carrier or carriage 66. Detachably secured to the carriage is a die block 67, which is secured in place through the medium of a locking mechanism indicated generally at 68, this mechanism being substantially the same as illustrated in the aforesaid applications. A means 69 also similar to that of the aforesaid applications, is provided for the purpose of detachably securing a die to the die block.

The type of die which is preferably used, is fully illustrated and described in the several aforesaid applications, and comprises a cutting element adapted to cut, perforate and/or penetrate at least into the work, and a stripper plate resiliently mounted slightly in advance of the cutting element. The stripper plate may carry marking elements which, after having ink or pigment applied thereto, serve to mark the work slightly prior to, or simultaneously with a perforating operation, the stripper thereafter functioning to strip the work from the cutter or perforator.

A driven crank shaft 70 is provided with a crank arm 71 cooperating with a connecting rod 72 which in turn is pivoted to a lug 73 at the rear of the carriage 66, this arrangement forming the driving mechanism for the carriage and die. For the purpose of driving the shaft 70 there is provided a train of gearing from the main power shaft 18 comprising a gear 75 which is formed as an extension of the constantly rotating hub of the pulley P. This gear meshes with a gear 77 which constantly rotates on the shaft 78 under the influence of the gear 76. The gear 77 is provided with an elongated hub forming ample bearing surface for a gear 79 which is slidably mounted on said hub. The gear 79 forms part of a unit which includes a clutch plate 80 spaced from the gear by a channel designed to receive the ends of a yoke 81. This yoke is carried by the shaft 28 and connected by means of a stud 82 to an arm 83 which is rigidly pinned to the shaft 28, or the yoke may be directly pinned to the shaft. The stud ensures movement of the yoke with the arm 83, regardless of wear on the pin securing same to the shaft.

When the arm 83 oscillates or rocks with the shaft 28 it will cause a corresponding movement of the yoke 81 thereby sliding the plate 80 and the gear 79, to clutch or declutch the unit and the constantly moving gear 77. The gear 79 forms part of a reduction gearing which includes a gear 84 in constant mesh with gear 79 and also in mesh with a gear 85 carried by the shaft 70.

It will be evident then that when the clutch disc 80 is actuated to engage the gear 77 that the die carrier will be actuated. In order to ensure that the carriage or die carrier 66 will be stopped after a complete movement to the forward part of the machine and return, there is secured to the face of the gear 84 a control plate 86 which is notched at 87 and 88. The notches are offset relative to

each other and to the axis of the plate in order to avoid any possibility of the machine stopping at dead center.

The arm 83 carries a roller 89 which rides on the side face of the plate 86 until such time as it hits one of the notches 87 or 88. When the roller drops into one of these notches under the influence of the spring 32, which is acting at all times to return the shaft 28 to its original position, the yoke 81 will disengage the clutch plate 80 from the gear 77 thus breaking the train of gearing.

When the machine is in its normal position of rest the roller 89 will be positioned in the notch 88, and the die carriage will be located inwardly or at the rear of the housing 10.

There may be some tendency towards backlash or "rebound" in the gears and to prevent any such movement the gear 84 carries on one face thereof a lug 95 positioned in the path of movement of a spring steel stop 101 secured to the frame of the machine. While effective to prevent retrograde movement, the resiliency of the spring permits the lug 95 to slip thereunder in its normal direction of movement.

It may be found desirable to counterweight the gear 85 as indicated by the counterweight W although this is not essential. If desired the counterweight may be duplicated on the two faces of the gear 85.

It is of course essential that movements of the plunger 15 be synchronized with those of the die carrier 66, as the plunger should not start its movement toward the die until the carrier has placed the die in exact alignment with a piece of work which is accurately positioned on the plunger.

To ensure this synchronization, there is provided a series of connections comprising a rocker arm 90 pivoted to the frame 10 and having one arm thereof connected to a link 91 which in turn is pivotally connected at 19' to the main clutch control lever 19. The other end of the rocker 90 carries a cam roll 92 adapted to engage and ride upon the periphery of the control plate 86. Adjacent the notch 88 is a cam lug 93, effective to actuate the rocker 90 once in a complete revolution of the control plate 86. Movement of the rocker as it rides over the cam lug 93 directly controls movement of the control lever 19, and thereby, the clutch C.

In order to apply ink to the marking elements of the die, which as stated above is of the combined cutting and marking type illustrated in the above mentioned copending applications, there is provided a spring controlled rocker 96 carrying at one end an ink applying roller 97 and a co-operating idler roll, this organization of rollers being substantially as described in copending application Serial No. 679,962. At the other end of the rocker is a roller 98 which rides on a cam 99 keyed to the shaft which carries gear 84 and the control plate 86. The cam is so positioned as to depress the roll 98 and thereby raise the inking mechanism as the die begins its forward travel and to release the roller on the return stroke of the die, whereupon the spring 100 will tend to pull the inking mechanism slightly below the path of movement of the die and thus prevent any accidental contact between moving parts. Of course, variation in the shape of the cam, and the time of applying ink can be effected, as desired.

This arrangement offers quite an advantage over machines utilizing a vertically reciprocable

die. In the latter case, the die must always come to rest with the die in a definite vertical position relative to the ink rolls, or damage will result. It is immaterial in the present machine where the parts come to rest, and there is no danger of breakage in the event of premature or inadvertent operation of the plunger.

There will thus always be a constant relationship between the die and the ink roll, i. e., there is no variation in the height of the die with respect to the ink roll other than the brief movement of the ink roll to a non-inking position on a return stroke of the die. The ink roll is relatively stationary, that is it does not move back and forth, although it is vertically adjustable, 15 rotatable on its own axis, and vertically movable under the influence of the cam 99 to permit free passage of the die on the return stroke.

Indicated generally at E—E are electric lights, of which one may be provided for each side of the machine.

To ensure accurate placement of the work on the plunger it is contemplated that a convenient form of gage plate, illustration of which will be found in each of the recited applications will be positioned on top of the brass surface 22, pins 102 being provided on the plunger to engage and retain such plate. These plates may have suitable abutment gages or other type of gages such that the work can be quickly positioned in accurate alignment with the operating position of the die. In this connection a gaging mask, or a hold-down for the work, may readily be associated with the plate either in lieu of, or cooperative with the plate gages.

Guards 103 in the form of flexible strips may be secured to the sides of the plunger to extend the length thereof, for the purpose of preventing chips or other debris from falling into the mechanism below the surface of the plunger. These guards may function merely to retain the chips against gravitational displacement, may deflect same to one side of the machine, where they will drop to the floor or into a suitable receptacle, or may be connected to any chip exhaust or removing means.

To ensure satisfactory cutting and marking of the work the usual paper backing may be utilized. A convenient form of paper feed mechanism is indicated generally at F' at the forward end of the machine and comprises a conventional pair of feed rolls enclosed in an apron and having adjusting means.

The paper will be fed over the surface 22 and under any gage plate that might be used, being taken from any convenient source of supply, in the machine, the plate, of course, being suitably cut away to permit passage of the cutting edges of the die through the work and into the backing paper beneath the gage plate.

Having thus described the machine the general operation thereof will be readily apparent. Assuming the plunger 15 to be in its lowermost position, die carrier 66 in its rear or innermost position, with a die secured thereto, the operator will place a piece of work on the top of the plunger by reference to any convenient gage means cooperating therewith and will treadle the machine. At this time the latch 46 is disengaged from the plate 44 by virtue of the fact that the link 54 which is connected to the arm 55 on the plunger is in its lowermost position.

Upon treading the machine the shaft 28 will be rocked, raising the roller 89 out of the notch 87, and shifting the clutch plate 80 into engage-

ment with the gear 77, which gear, constantly rotating under the influence of the gear 76, will start the train of mechanism moving, and push the die carrier over the plunger, the ink applying mechanism operating at the beginning of this movement to work the marking elements of the die.

As the carriage 66 reaches its outer position, the roller 89 drops into notch 87, and the arm 83 moves to disengage clutch plate 80, whereby the die and carriage momentarily come to rest.

In the meantime, the rocker arm 90 will have moved, under the influence of the lug 93, to actuate the link 91 slightly to the left, (Fig. 1) forcing the lever 19 out of its track to permit the clutch key K of clutch C to slide across the track or channel under the influence of its spring thereby clutching the pulley P to shaft 18, which is connected to the plunger actuating mechanism 16 through the eccentric 17. As soon as the roller 92 passes over the cam lug 93 the rocker will return to its original position under the influence of its spring, restoring the clutch control lever 19, to its original position in the path of the clutch key.

By the time that the control plate 86 has rotated approximately 180°, permitting the roller 89 to drop into the notch 87, the plunger will make its upstroke against the die and start to return, being actuated by shaft 18, for one revolution thereof. The die, however, is in its outermost position and must be returned. This return is effected by virtue of the fact that the latch 46, rising under the influence of the upward movement of the plunger has engaged the plate 44 and as the plunger begins to descend will grip the plate 44 and thus rock shaft 28 a second time, in effect duplicating the original treadling motion, without need of the operator doing anything more.

This action removes the roller 89 from the notch 87 and a spring pressed shutter 94 will immediately drop across the notch 87 to prevent the roller 89 from slipping back until such time as the control plate 86 has travelled on, this shutter acting to take the place of an operator's foot on the treadle.

As the latch descends under influence of the plunger, it will be kicked off the plate 44 by the cam finger 53 whereupon, the control plate 86 completes 360° of revolution and the roller 89 drops back into the notch 88. In the meantime, the control lever 19 wedges between the clutch key K in the clutch hub C, and forces same away from the pulley hub, and all operations of the machine will cease, except, of course, for the continued rotation of the plunger P, the gear 76 and the gear 77.

Descent of the plunger causes the stud 124 carried by the arm 55 to engage the extension 125 of the brake linkage and apply the brake, to stop the shaft 18 and associated plunger driving elements from further movement.

Should it be desired to operate the die carriage, exclusively of the plunger, for the purpose of removing or replacing a die thereon, one has but to disengage the link 54 from the arm 55 by means of the handle 60 and treadle the machine, whereupon there will be no actuation of the plunger but a forward movement of the die carriage will be obtained, the power being disconnected, however, at the notch 87. A second treadling of the machine thereafter will act to return the die carriage and stop all operations.

Advantages in the arrangement of parts where-

in the die carriage and die move through a lateral plane while the ornamenting operation is effected by movement of the work supporting plunger through a substantially vertical plane, include the constant retention of the die in a predetermined exact relation to the inking mechanism, making it impossible to injure the ink applying roller 97, or to apply insufficient ink by means of such roller to the die. Where a die is carried by a reciprocating plunger, it is possible that inertia of the moving plunger might bring the die into different positions of rest after successive operating strokes.

Again, with this construction it is unnecessary to slide the work support to an inoperative position for placement of work thereon. With a work support movable into and out of aligned relation to the die, as distinguished from the instant construction wherein the die partakes of the movement into and out of aligned relation with respect to the plunger, a gage plate as above described, mounted on the pins 103, would have to move relative to the backing paper, and would tend to displace the work on the gage plate, by contact through the openings or cutout portions of the gage plate. In machines utilizing slidable work supports, the openings in the gage plate are made as small as possible, and beneath them is secured another plate of thin, tough material filling all the space possible between the work and the backing paper as described in my Patent No. 1,990,593, of February 12th, 1935, to minimize such displacement of the work.

Inasmuch, however, as the construction of the present machine offers no relative movement between the backing paper and the work after the work is located on the gage plate, the cut away portions in the gaging plate can be made larger than heretofore considered desirable, whereupon that portion of the work to be marked and cutout will be resting directly on the backing paper and when the marking element contacts the work, the work will be bottomed upon the paper and not held away from it by edges of the gage plate. This prevents the marking elements from first contacting the work and then moving with the work to bottom it against the paper backing, an operation that might result in a slight shifting of the work, and production of a wide or blurred mark, or a double mark.

Further, the thin plate across the bottom of the gage plate can be eliminated, and the work can be cut completely around, a feature which may not be practical where there is a possibility of movement between the work and any contacting surface.

The mechanism just described, while illustrative of a preferred form of practicing the invention is, of course, susceptible to modification by those skilled in the art, and it is not intended that this invention shall be limited except as defined in the appended claims.

As illustrative of one modification of the control mechanism, reference may be made to Fig. 7, as showing an embodiment wherein the shaft 28 is capable of slight endwise movement, a handle 105 being provided for this purpose. A pair of notches 106 and 107 are formed in the shaft, selectively to receive a latch 108 pivoted on the foremost bearing lug 29. A clutch element 109 is pinned to the shaft, and mounted on the shaft adjacent thereto is a clutch shifter element 110 which carries a handle 111 for adjustment purposes, a spring pressed lock pin 112 being arranged internally of the handle 111 and adapted to enter

a notch on the shaft, and lock the shifter 110 in neutral position.

The treadle rod 13, will be connected to a projection on the member 110. At the opposite side of shifter 110 from the clutch member 109, is a second clutch member 113, this member, however, being mounted for free rotary movement on the rod 28, and carrying a cam finger 114. The members 109 and 113 are notched, and the member 110 is provided with projections adapted to engage the notches of one or the other of these clutch members.

Slidable transversely of the shaft 28, through a bearing 115 is a push rod having a main body section 116 which carries a stop pin 117 engageable with the bearing to limit upward movement of the rod, which is connected by a spring 118 to the bearing in order to ensure a normal return to upward position. The upper end or tip of the push rod is arranged to engage the cam finger 114.

The lower part of this push rod is formed as an extension 119 hinged to 116 as indicated at 120. This extension carries on its inner face, a wedge or cam block 121 which tapers outwardly and upwardly, and the frame 10 supports an adjustable pin 122 in a position where it will ride against the tapered surface of the cam block, and which is effective to move the extension, through such engagement, out of alignment with the main portion 116 of the rod.

A pin and slot connection is provided between the end of this extension and an arm 123 which may be secured to or formed integrally with the control lever 19.

The arm 55 mounted on the plunger 15 carries the adjustable stop 124 and the brake B has an operating extension 125 projecting into the path of movement thereof, such that downward movement of the plunger will cause an application of the brake, just as described above.

Control means are provided for running the carriage thorough a normal stroke out and return, and also for rendering the actuating mechanism for the die carrier inoperative, should it be desired to operate the plunger exclusively. To this end, the notch 87 is made radially shorter than the notch 88, consequently when the shaft 28 is shifted to the right and the stop or latch 108 dropped into the notch 106, the roller 89 will travel past the inner end of the notch 87 and drop into the notch 88 only, thus running the table out and back, to stop only in its rear position. On the other hand when the shaft 28 is shifted to the left the notches 87 and 88, both, will be operative.

This control mechanism will operate as follows.

When the shifter member 110 is in engagement with the clutch element 113, as shown in Fig. 7, a treading of the rod 13 will depress the cam finger thereby pushing the rod 116 downwardly, but will not rock the shaft 28, and hence the carriage 66 will not move. The lower edge of the cam lug 121 will first engage the arm 123 to remove the clutch control lever 19 from the channel in clutch C and permit the clutch key to slide into clutching engagement with the pulley hub thereby causing an actuation of the shaft 18. Thereafter the pin 122 acting on the cam lug 121 will push the extension and cam lug out of alignment with the main section 116 to release the control lever 19, whereby the clutch key will be forced back to an inoperative position as soon as a single revolution of the shaft 18 has been effected, and these parts will come to rest.

The plunger in the meantime, however, has made one movement up and down, and in its

down movement the stop 124 will apply the brake and ensure prompt stopping of the shaft 18.

An advantage of this arrangement is that the die might be positioned forwardly of the machine, for an indefinite number of plunger operations, as in cases where no inking of the die is required.

When the shifter 110 is in engagement with the clutch element 109, the control and actuating mechanism for the die carriage 66 will be rendered operative as the element 109 is pinned to the shaft 28, but the rod 116 and mechanism for actuating the plunger will be disconnected. However, the plunger mechanism will be connected to the source of power, through the rocker 90.

To control style of stroke in the carriage, the shaft 28 will be longitudinally shifted by means of the handle 105 to the right for complete movement out and back and, inasmuch as the notch 87 is radially shorter than the notch 88, the roller 89 having moved with the shaft 28 will pass the notch 87 without dropping therein and will come to rest in notch 88 only, with the carriage in its rear position. Or, when shifted to the left position, illustrated in Fig. 7, the carriage will stop at each end of its stroke.

At such times as the machine is operated with the die carrier inoperative or not moving, the arm 90 and connections will merely idle relative to plate 86. When it is desired to synchronize movements of the plunger with those of the die carriage, the connections including the rocker 90 will be utilized, and the shifter 110 will be positioned to engage with the clutch element 109, and the clutch member 113 together with cam 114 will not move, the shaft 28 oscillating freely therein.

With the mechanism of the modifications just described it is possible to operate the plunger and carriage in synchronized relation to operate either to the exclusion of the other, or to operate the carriage through a half stroke, i. e., outwardly and stop, or inwardly and stop, either alone or in conjunction with a plunger movement.

The stud 82, while not essential in the form of machine illustrated in Fig. 1, takes on added importance in the modification of Fig. 7. In this latter case, the yoke 81 must be free on the shaft 28, to permit endwise movement of the shaft, and hence the stud 82 forms the sole actuator for the yoke.

It may be found desirable to utilize a spring controlled telescopic connection 12a in place of the rigid rod 72, which will ensure that the die carrier always moves to the forward part of the machine, to be held in position by plates 126 secured across the ends of the track 65, as illustrated particularly in Fig. 2.

Although this arrangement is illustrated in conjunction with the modification of Fig. 7, it is readily adaptable to the other embodiments of the invention, e. g., as in Fig. 1.

When using a telescoping rod, the counterweights W, and the rebound spring 101 are unnecessary. An advantage of the spring pressed, telescopic connection resides in the possibility of obtaining a dwell in the carriage at the end of the forward stroke. This is effected by compression of the spring, as the plates 126 stop the carriage.

While the spring controlled telescopic connection and the plates 126 function to maintain the die and plunger in an accurate relationship, it is contemplated that other equivalent means might be substituted, particularly if the rigid

drive 72 is used and plates 126 are omitted. For example, such means might take the form of a spring pressed trigger element whereby the die would be stopped in a desired position, or might take the form of a pin extending from the face of the work table and movable into a bevelled edged opening on the die such that should the die and carrier be slightly out of alignment when over the work table, the pin would serve through engagement with the opening to push the carriage into proper position, or if the misalignment is too great, the pin would prevent contact between the die and work support thereby preventing injury to the work and various associated parts. Among the many advantages offered in the present machine over machines of prior art and practice, is that of permitting use of a self-contained anvil and paper feed mechanism, an example of which will be found in the Thomas patent, Reissue No. 17,085, dated September 18th, 1928, or various other types of known dies which might readily be substituted for the die block and die described above. With such dies it is not even essential that the carriage and its actuating mechanisms be operated.

Obviously the herein described machine will perform the function of cutting or marking per se, or in combination.

Other advantages are the provision of ample space both horizontally and vertically, for large work, with the die moving away in a horizontal direction from a location over the plunger. This latter permits a great saving of time in that the operator can remove or position the work while the die and carriage are moving to a return position. The die being entirely out of the way cannot injure the operator. Should the operator's hands happen to be in the path of the die, then the die will act to sweep the hands out of the way and cannot crush or otherwise injure them.

In this connection it should be pointed out that the normal vertical clearance between the work and the die with the parts separated is insufficient to permit insertion of the hands therebetween, the removal or placement of the work being effected after the die has started away from a position over the work support.

The entire construction, regardless of which details or modification may be utilized, is intended to be as "fool proof" as it is possible to make a machine and at the same time so simple in operation that a relatively inexperienced operator will have no difficulty.

Modification of the driving mechanism for the carriage 65 will occur to those skilled in the art, and as illustrative of such modification within the scope of this invention reference is made to the fact that an electric or magnetic drive might be provided for the die carrier, and such mechanism might utilize a quick traverse lead screw, a reversible motor, and suitable controls actuable under the influence of the die carriage, when same reaches a predetermined position.

Use of the term cutting element in the specification and claims is not intended as limiting, but as inclusive of cutting, slitting, perforating and partial penetration of the work.

Having thus described my invention what I claim as new and desire to secure by Letters Patent of the United States is:—

1. An ornamenting machine of the class described comprising a work support, movable through a substantially vertical path, an ornamenting die mounted for movement through a

substantially horizontal path of movement, and means to actuate said support and die in synchronized relation.

2. An ornamenting machine of the class described comprising a movable work support, an ornamenting die mounted for movement into and out of an aligned operating position relative to said work support, and means to actuate said support and die in synchronized relation.

3. An ornamenting machine of the class described comprising a movable work support, an ornamenting die mounted for movement into and out of an aligned operating position relative to said work support, means to actuate said die, and means to actuate said support through an operating stroke.

4. An ornamenting machine of the class described comprising a movable work support, an ornamenting die mounted for movement into and out of an aligned operating position relative to said work support, means to actuate said die, means to actuate said support through an operating stroke and means to synchronize the actuating means for said die and support, whereby said support will effect an ornamentation of a work piece positioned thereon, when the die is in its aligned operating position.

5. An ornamenting machine of the class described comprising a movable work support, an ornamenting die mounted for movement into and out of an aligned operating position relative to said work support, means to actuate said die, means to actuate said support through an operating stroke, means to synchronize the actuating means for said die and support, whereby said support will effect an ornamentation of a work piece positioned thereon, when the die is in its aligned operating position, and means to render said synchronizing means inoperative.

6. An ornamenting machine of the class described comprising a movable work support, an ornamenting die mounted for movement into and out of an aligned operating position relative to said work support, means to actuate said die, means to actuate said support through an operating stroke, means to synchronize the actuating means for said die and support, whereby said support will effect an ornamentation of a work piece positioned thereon, when the die is in its aligned operating position, means to render said synchronizing means inoperative, and control means to effect a selective, independent operation of the die actuating means and support actuating means.

7. An ornamenting machine of the class described comprising a movable work support, an ornamenting die effective to apply a marking medium to a work piece on said support, and mounted for movement into and out of an aligned operating position relative to said work support, means to actuate said support and die in synchronized relation, and means to apply a marking medium to said die during movement thereof.

8. An ornamenting machine of the class described comprising a movable work support, an ornamenting die including an element effective to apply a marking medium to a work piece on said support, and mounted for movement into and out of aligned operating position relative to said work support, means to actuate said support and die in synchronized relation, and means to apply a marking medium to said die element as the die moves into its aligned operating position.

9. An ornamenting machine of the class de-

scribed comprising a movable work support, a combined perforating and marking die unit mounted for movement into and out of an aligned operating position relative to said work support, means to actuate said unit, means to apply a marking medium to said unit during movement thereof, and means to actuate said support through an operating stroke when said unit reaches its aligned position, whereby a work piece on said support will be marked and perforated in a single operation.

10. An ornamenting machine of the class described comprising a movable work support, an ornamenting die including an element effective to apply a marking medium to a work piece on said support, and mounted for movement into and out of aligned operating position relative to said work support, means to actuate said support and die in synchronized relation, means to apply a marking medium to said die element as the die moves into its aligned operating position, and means to move said medium applying means to an inoperative position, during movement of said die away from its aligned operating position.

11. An ornamenting machine of the class described comprising a movable work support, an ornamenting die mounted for movement into and out of an aligned operating position relative to said work support, and gage means cooperating with said support for positioning a work piece in accurately aligned relation to said die, and means to actuate said support and die in synchronized relation to each other whereby to first position the die and thereafter move the support into engagement with the die to effect an ornamentation of the work piece.

12. An ornamenting machine of the class described comprising a movable work support, an ornamenting die mounted for movement into and out of aligned operating position relative to said work support, means to actuate said die, means to actuate said support, disconnectible means to interconnect said actuating means for synchronized operation, and a single operator controlled means for initiating actuation of all of said means.

13. An ornamenting machine of the class described comprising a movable work support, an ornamenting die mounted for movement into and out of aligned operating position relative to said work support, means to actuate said die through a portion of its cycle of operations, means to actuate said work support, means to synchronize said die and support actuating means whereby said die actuating means is thereafter effective to complete the cycle of operations of the die, operator control means for initiating operation of all of said means through the first portion of the cycle, and automatically controlled means for initiating actuation of the subsequent operation of the die actuating means.

14. An ornamenting machine of the class described, comprising a movable plunger, a reaction member mounted for movement into and out of an operative position opposed thereto, work supporting and ornamenting means operatively interposed between said plunger and member, and means to actuate said plunger, work supporting and ornamenting means through an operating stroke effective to ornament a piece of work supported between the plunger and member.

15. An ornamenting machine of the class described, comprising a movable plunger, a reaction member mounted for movement into and out of an operative position opposed thereto, work support-

ing and ornamenting means operatively interposed between said plunger and member, means to actuate said plunger, work supporting and ornamenting means through an operating stroke effective to ornament a piece of work supported between the plunger and member, means to actuate said reaction member, and means interconnecting the respective actuating means for said plunger and reaction member, effective to synchronize movement thereof.

16. An ornamenting machine of the class described, comprising a movable plunger, a reaction member mounted for movement into and out of an operative position opposed thereto, work supporting and ornamenting means operatively interposed between said plunger and member, means to actuate said plunger through an operating stroke effective to ornament a piece of work supported between the plunger and member, means to actuate said reaction member, means to connect said plunger and member actuating means for synchronous operations, and manually detachable means for breaking such connection, whereby either of said plunger and member may be actuated independently, and exclusively.

17. An ornamenting machine of the class described comprising a movable plunger, a reaction member mounted for movement into and out of an operating position opposed thereto, means carried by said plunger for accurately gaging and aligning a piece of work in operating position thereon, and means to actuate said plunger through an operating stroke toward and from said reaction member.

18. An ornamenting machine of the class described comprising a base, a frame, and a head carried thereby, a plunger mounted in said base for substantially vertical reciprocatory movement, power actuated operating mechanism therefor mounted in said base, a die carriage mounted in said head for movement through a path angularly disposed to the path of movement of said plunger, and into and out of a position of alignment relative to said plunger, actuating mechanism for said carriage, carried by said frame, means to mount a die on said carriage, control means effective to synchronize movements of said plunger and carriage, and means mounted in said frame for applying a marking medium automatically to said die during movement of said carriage.

19. An ornamenting machine of the class described, comprising a movable plunger having a work supporting surface, an ornamenting die mounted for movement through a path angularly disposed to the path of movement of said support, means to vary the location of said work supporting surface with respect to said plunger and thereby vary the effective operating position of the plunger relative to said die, and means to actuate said support and die in synchronized relation.

20. An ornamenting machine of the class described, comprising a movable work support, an ornamenting die mounted for movement into and out of an aligned operating position relative to said work support, means to actuate said support and die in synchronized relation, means to initiate actuation of said actuating means, and means to render said initiating means inoperative after a single operation thereof.

21. In an ornamenting machine having a work support and an ornamenting die and means for producing a relative movement therebetween to ornament a piece of work on said support, the

combination with a control means comprising a member effective to clutch a power supply means to said actuating means, and means to disconnect said member from operative engagement with the machine, automatically upon a single movement thereof, and to restore such operative engagement immediately upon return of said member to its original position.

22. An ornamenting machine of the class described comprising a movable plunger, a reaction member mounted for movement into and out of an operative position opposed thereto, means to detachably mount a die on said reaction member, work supporting and gaging means carried by said plunger, and means to actuate said plunger through an operating stroke effective to ornament a piece of work supported between the plunger and member.

23. An ornamenting machine of the class described, comprising a movable work support, an ornamenting die mounted for movement into and out of aligned operating position relative to said work support, means to actuate said support and die in synchronized relation including a power applying means, means to clutch and declutch said power applying means to said die and support actuating means, and automatically operable means to brake said actuating means when said power supply means is declutched.

24. An ornamenting machine of the class described, comprising a movable plunger, a reaction member movable into a position opposed thereto, work supporting and ornamenting means operatively interposed between said plunger and member, said ornamenting means comprising a cutting means and a marking element, and means to apply a marking medium to said marking element for subsequent transfer to the work, means to actuate said plunger and work supporting means through an operating stroke effective to apply the marking medium to a piece of work supported between the plunger and said reaction member, and means to hold said reaction member in its position opposed to the plunger, during a plurality of ornamenting operations, and operating strokes of said plunger.

25. An ornamenting machine of the class described, comprising a frame, a rigid guide therein, a plunger reciprocable in said guide, a reaction member mounted in said frame above said guide, in the path of said plunger, and opposed thereto, work supporting and ornamenting means operatively interposed between said plunger and member, said ornamenting means comprising a cutting means and a marking element, and means to apply a marking medium to said marking element for subsequent transfer to the work, and means to actuate said plunger and work supporting means through an operating stroke effective to apply the marking medium to a piece of work supported between the plunger and said reaction member.

26. An ornamenting machine of the class described, comprising a frame, a rigid guide therein, a plunger reciprocable in said guide, a reaction member mounted in said frame above said guide, in the path of said plunger, and opposed thereto, work supporting and ornamenting means operatively interposed between said plunger and member, said ornamenting means comprising a cutting die and a marking element, means to apply a marking medium to said marking element for subsequent transfer to the work, and means to actuate said plunger and work supporting means

through an operating stroke effective to ornament a piece of work supported between the plunger and said reaction member.

27. An ornamenting machine of the class described, comprising a frame, a guide in said frame, a vertically reciprocable plunger in said guide, a reaction member mounted in said frame above said guide and in opposed relation to said plunger, work supporting means mounted on said plunger and work ornamenting means carried by said reaction member, said ornamenting means comprising a cutting means and a marking element, and means to apply a marking medium to said marking element for subsequent transfer to the work, and means to actuate said plunger and work supporting means through an operating stroke effective to apply the marking medium to a piece of work supported between the plunger and said reaction member.

28. An ornamenting machine of the class described, comprising a frame, a rigid guide therein, a plunger reciprocable in said guide, a reaction member mounted in said frame above said guide, in the path of said plunger, and opposed thereto, ornamenting means operatively interposed between said plunger and member, said ornamenting means comprising a cutting means and a marking element, and means to apply a marking medium to said marking element for subsequent transfer to the work, means carried by said plunger for accurately gaging, aligning and supporting a piece of work in operating position with respect to the ornamenting means, and means to actuate said plunger through an operating stroke toward and from said reaction member whereby to ornament a piece of work supported on the plunger.

29. An ornamenting machine of the class described, comprising a vertically reciprocable plunger, a reaction member opposed thereto, means to detachably mount an ink marking die and cutting means on said reaction member, means to apply ink to said die during normal operation of the machine for subsequent transfer to the work, work supporting and gaging means carried by said plunger, and means to actuate said plunger through an operating stroke toward and from said reaction member whereby to ornament a piece of work supported on the plunger.

30. An ornamenting machine of the class described, comprising a frame, a rigid guide therein, a plunger reciprocable in said guide, a reaction member mounted in said frame above said guide, in the path of said plunger, and opposed thereto, work supporting and ornamenting means operatively interposed between said plunger and member, said ornamenting means comprising a cutting die and a marking element, means to apply a marking medium to said marking element for subsequent transfer to the work, means to apply said marking element to the work to produce markings thereon, and to provide such contact between said cutting die and the work as to cut out a pattern in the work, the beginning and completion of said cutting out being effected while said marking element is contacting the work.

31. An ornamenting machine of the class described, comprising a frame, a rigid guide therein, a plunger reciprocable in said guide, a reaction member mounted in said frame above said guide, in the path of said plunger, and opposed thereto, work supporting and ornamenting means operatively interposed between said plunger and member, said ornamenting means comprising a cut-

ting die and a marking element, means to apply a marking medium to said marking element for subsequent transfer to the work, said marking element and cutting die being located relative to each other such that the marking element will contact the work in advance of the cutting die, and means to actuate said plunger and work supporting means through an operating stroke effective to ornament a piece of work supported between the plunger and said reaction member.

32. An ornamenting machine of the class described, comprising a movable plunger, a reaction member movable into a position opposed thereto, work supporting and ornamenting means operatively interposed between said plunger and member, said ornamenting means comprising a cutting means and a marking element, and means to apply a marking medium to said marking element for subsequent transfer to the work, means to actuate said plunger and work supporting means through an operating stroke effective to apply the marking medium to a piece of work supported between the plunger and said reaction member, means to hold said reaction member in its position opposed to the plunger, during a plurality of ornamenting operations, and operating strokes of said plunger, and means to connect said reaction member to the plunger actuating means for synchronous operation with respect to said plunger.

33. An ornamenting machine of the class described, comprising a work support and a die, means to effect relative lateral movement between said work support and die, whereby work may be readily placed upon and removed from said support at a location spaced from said die and pressure applying means to move said work and work support into ornamenting relation with said die, through a substantially vertical plane, whereby to effect an ornamenting operation on the work.

34. An ornamenting machine of the class described, comprising a work support, a cutting die and a marking die, means to effect relative lateral movement between said work support and dies, whereby work may be readily placed upon and removed from said support at a location spaced from said dies, means to ink said marking die during said relative lateral movement, and pressure applying means to move said work and work support into ornamenting relation with said dies, through a substantially vertical plane, whereby to effect an ornamenting operation on the work.

35. An ornamenting machine of the class described, comprising a work support, a cutting die and a marking die, means to effect relative lateral movements between said work support and dies, whereby work may be accurately positioned upon said support while said support and dies are separated and spaced from each other, accurately aligned with said dies, and after an ornamenting operation be removed from said support for replacement, means to ink said marking die during at least one of said relative lateral movements, and means to move said work and work support into ornamenting relation with said dies, through a substantially vertical plane whereby to cut and ink mark the work.

36. An ornamenting machine of the class described, comprising a work support, a cutting die and a marking die, means to effect relative lateral movement between said work support and dies, whereby work may be readily placed upon and removed from said support at a location spaced from said dies, means to ink said marking die during said relative lateral movement including an ink roll mounted in the plane of the inking surfaces of said marking die to apply ink thereto for successive operations by said die, and means to move said work and work support into ornamenting relation with said dies, through a substantially vertical plane, whereby to effect successive ornamenting operations on the work.

37. An ornamenting machine of the class described, comprising a work support and a die, means to accurately locate a piece of work on said support, means to effect relative lateral movements between said work support and die, whereby work may be accurately positioned upon said support while said support and die are separated, and spaced from each other, accurately aligned with said die, and after an ornamenting operation be removed from said support, for replacement, pressure applying means to move said work and its support into ornamenting relation with said die through a substantially vertical plane, whereby to effect an ornamenting operation on the work, and means to restrain said pressure applying means from operation until said work support, work, and die are in exact alignment.

38. An ornamenting machine comprising a marking die and a cutting die, means to accurately position a work piece relative to said dies, pressure applying means for effecting a movement of said positioning means and work into ornamenting relation to the dies, means to actuate said pressure actuated means, thereby to ornament the work, and means to control movement of said pressure applying means until the work piece and dies are accurately positioned with respect to each other.

39. A machine for ornamenting shoe parts comprising a movable work support, a marking die having a marking surface, means to effect relative lateral movement between said support and die, means to apply ink to said marking surface and thereafter separate said die and inking means during such movements, and means to move the work under pressure, into ornamenting engagement with the die.

40. A machine for ornamenting shoe parts comprising a movable work support, a marking die having a marking surface, a cutting die having a cutting element, means mounting said marking and cutting elements in relatively different planes, whereby ink may be applied to said marking element alone, means to effect relative lateral movements between said support and die, means to apply ink to said marking element and thereafter separate said die and inking means during such movements, and means to move the work under pressure into ornamenting engagement with said dies.

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