

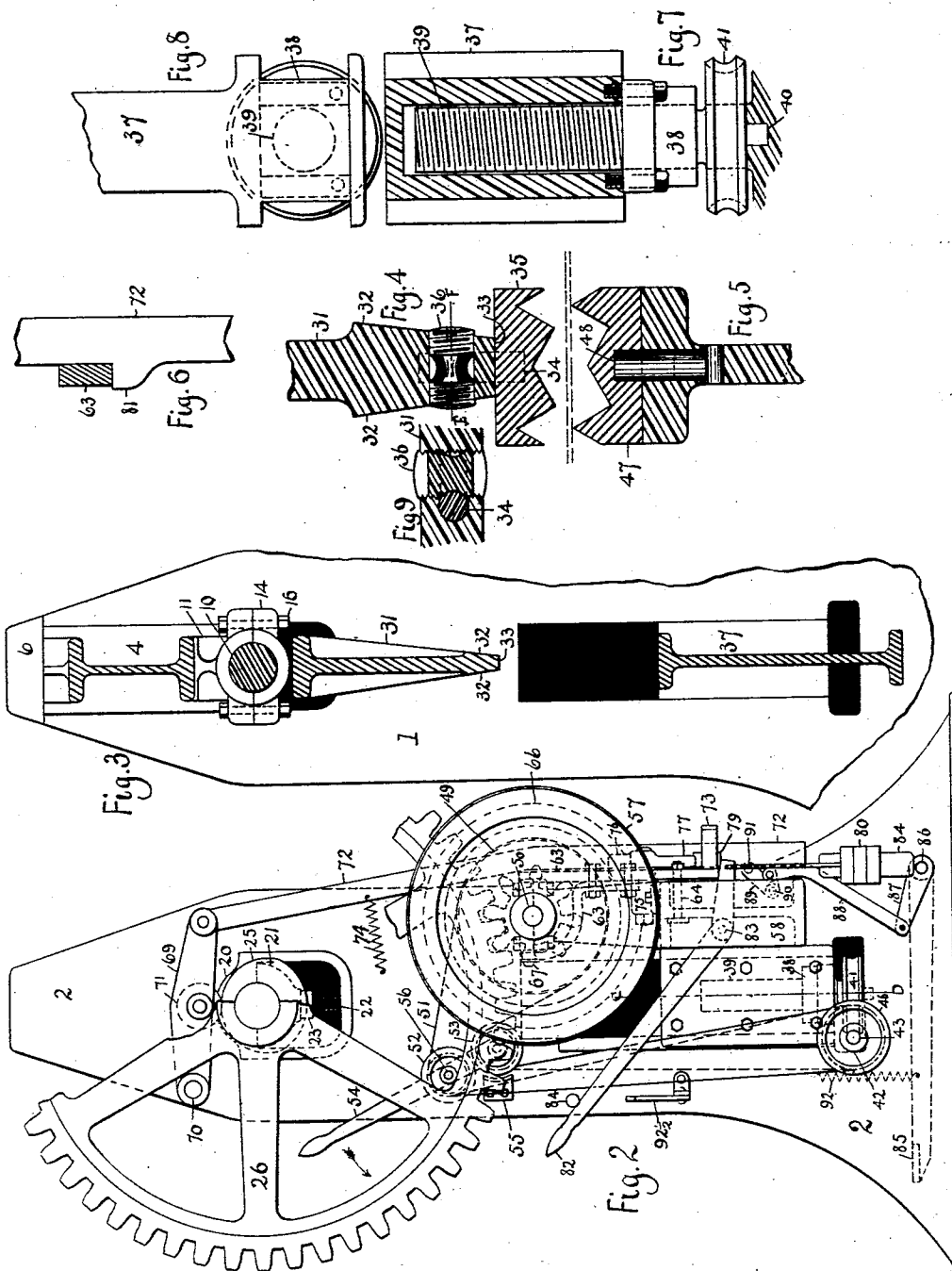
(No Model.)

2 Sheets—Sheet 2.

G. HENDERSON.
CORNICE MACHINE.

No. 573,655.

Patented Dec. 22, 1896.



WITNESSES
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CORNICE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 573,655, dated December 22, 1896.

Application filed February 27, 1896. Serial No. 581,010. (No model.)

To all whom it may concern:

Be it known that I, GEORGE HENDERSON, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Cornice-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to power pressing-machines for forming cornices, metal moldings, or making bends in sheet metal.

The object of my improvements is to construct a simple machine having an automatic stop-motion by which the dies are stopped automatically at each stroke unless the attendant, by means provided him, throws out the automatic stop-motion to allow the machine to make several successive strokes, as is sometimes necessary in some classes of work. In consequence of my stop mechanism the attendant can do much more work than with any previous machine, as my machine can be run faster, the attendant having only to adjust the sheet of metal being worked after each stroke and not having to also watch the moving die to know when he can do so. I also provide means for elevating or depressing the table, so a nice and close adjustment may be made of the dies to the work and to enable different heights of dies to be used, the table being operated by power at the will of the operator. I also provide a hand mechanism by which the slide and its die may be moved any part of the stroke for more perfect adjustment when setting the dies to each other, these improvements being the means by which my machine is able to produce superior work to any heretofore done and at much less cost. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my machine. Fig. 2 is an end elevation. Fig. 3 is a section on line A B, Fig. 1. Fig. 4 is a vertical section of an upper die and a part of the slide. Fig. 5 is a vertical section of a lower die and a part of the table. Fig. 6 is a fragment of the cam-rod where its lug engages the bent yoke-lever. Fig. 7 is a vertical section of one end of the table on line C D, Fig. 2. Fig. 8

is a plan of Fig. 7. Fig. 9 is a section on line E F, Fig. 4.

Similar reference-figures refer to similar parts throughout all the views. 55

The general framing and support of my machine is composed of upright frames 1 2, they being broadened at their base 3 to form a secure and reliable foundation for the machine. At the upper part or end of 1 and 2 they are united by a tie-girder 4, placed between 1 and 2 and held by bolts 5, and by upper lugs 6 on 1 and 7 on 2 the tie-girder is machine-fitted at its ends and abuts a fitting-strip 8 on 1 and 9 on 2. A double-crank shaft 10 is suspended 65 to the tie-girder 4 by hangers 11 12, held by bolts 13 and having caps 14 15, held by bolts 16. Outside of the hangers 11 12 are double cranks 17 18. These cranks are in line and are of comparatively short stroke. The shaft 70 10 has bearings 19 20, formed in 1 2, each bearing having an under cap 21, held up by bolts 22 and nuts 23, the bolts 22 being decreased in diameter and entering pockets 24 in the frames 1 and 2. Outside of frame 2 on 75 shaft 10 a cam 25 is fixed, and farther out is a spur gear-wheel 26.

The cranks 17 18 are coupled by rods 27 28 to seats 29 30, secured to the slide 31, guided at its ends in frames 1 and 2. The slide 31 80 is beveled at its lower sides 32, and into its lower edge 33 are inserted the pins 34 of the upper die 35. These pins are secured in place by lock-screws 36, tapped through the lower part of the slide. These lock-screws 36 have 85 slotted ends, and midway of their length they are formed with a neck decreased in diameter and cutting away the thread, they being formed to fit closely around the pins 34, and after the pin is inserted a turn of the lock-screw 36 will cause it to hug the pin 34 and prevent its dropping out. 90

It will readily be seen that by the arrangement of parts described the slide 31 has a fixed upward-and-downward movement whenever 95 the shaft 10 is revolved by the spur gear-wheel 26, one revolution of the shaft causing one fixed and unchangeable downward advance of the slide and the receding of the same for another stroke. Below the slide is 100 a girder-table 37, guided by frame 1 and frame 2 and supported upon nuts 38, secured

under each end, the nuts being supported upon screws 39, which are screwed into them. The screws are decreased in diameter at their lower ends 40 and inserted in a pocket in the frames 1 2, which support them. At the lower end of each screw 39 is fixed a worm-wheel 41, actuated by a worm 42, fixed upon a shaft 43, carried in bearings 44, attached to the inside of the frames 1 2, collars 45 being on the shaft 43 to adjust any end movement of the shaft 43, the shaft connecting the two worms and reaching outside of frame 2, where a pulley 46 is attached, this arrangement of parts causing the screws 39 to revolve simultaneously when the pulley 46 and shaft 43 are turned, and the girder-table will consequently be moved up or down, according to the way the screws 39 are turned into or out of the nuts 38, the girder-table going up or down parallel and true. On top of the girder-table 37 the lower die 47 rests, being held true to place by the pins 48. The plate of metal to be formed is shown in dotted lines in Fig. 5.

The screws 39 are driven by the pulley 46 and by 49, fixed upon the driving-shaft 50, the belt 51 passing over two idler-pulleys 52 53, secured to a hand-lever 54, fulcrumed upon and secured to the outside of the frame 2 at 56. Whenever it is desired to raise the girder-table 37, the lever 54 is pulled down in the direction indicated by the arrow. This tightens the belt 51 on the pulleys 49 52 53 46 and causes the revolving of the screws 39, and should it be desired to lower the girder-table the belt 51 will be removed from the pulley 46, and after being crossed will again be put upon 46, as shown in dotted lines, which will give a reverse movement of the screws 39. The lever 54 normally stands up, and the belt 51 is then loose and inoperative, it being held fast between the idler-pulley 53 and the stop 55, the stop circling partially around the pulley, but removed enough therefrom to not touch except when the pulley 53 is forced against it by lever 54.

Upon the main shaft 50 is the driving-pulley 57 at its outer end. This is a heavy-rimmed pulley, being made heavy to act as a balance-wheel. Inside the pulley 57 is a bracket 58, attached at its inner end to frame 2 and forming a journal-bearing at its outer upturned end where the shaft 50 is seated and over which the cap 59 is secured. Inside of the bracket is a collar 60. Still farther in, on the shaft 50, is a friction-clutch of any suitable make, the part 61 of the clutch being secured to revolve with the pinion 67 and the part 62 being so arranged as to move along the shaft 50 and also to revolve with it to engage the part 61 for revolving or disengage the part 61 for non-revolving, the sleeve part 62 being controlled by a bent yoke-lever 63, fulcrumed at 64 on the bracket 58, being forked to engage a trunnion 65 on each side of 62 and passing backward from the fulcrum beyond the face and to the outside of the

frame 2. The clutch 61 62 is shown as engaged and revolving the disk 66 and the pinion 67, which revolves the spur gear-wheel 26, on shaft 10, and moves the slide 31. The inner end of shaft 50 is supported in a flanged sleeve-bearing 68, attached to frame 2.

The cam 25 has resting upon and moved by it a lever 69, fulcrumed at one end 70 to frame 2, having a roller 71 directly over the cam 25, and at its outer end the lever 69 carries a flat rod 72, which passes down outside of the bracket 58, its lower end being controlled by a guide 73, and it also has a spring 74 attached to it and to frame 2 to return it to its normal position after being forced aside. The guide permits the up-and-down and outward movement of the rod 72, as will presently be described.

The bracket 58 has a double journaled seat 75 resting on and secured to its upper side central with the disk 66. Journaled in 75 are a pair of oppositely-moving friction-plates 76, having extensions 77 reaching below the seat 75 and spread apart, each having an adjusting-screw and nut 78.

Seated upon the bent yoke-lever 63 is a wedge-shaped projection 79, arranged to engage the extensions 77, force them apart, and press the plates 76 against each side of the disk 66 whenever the end of the lever 63 is raised, a weight 80 being hung thereon to keep the lever 63 in normal position. The rod 72 has a projection 81 reaching under the bent yoke-lever 63. A hand-lever 82 is fulcrumed at 83 on frame 2, from which the handle end inclines upward and outward and rests under and against a stop 84, inserted into the frame 2. The end of the lever from the fulcrum 83 projects inwardly toward the bent yoke-lever 63, under which it passes, and, extending outward, has a weight 84½ hung to its outer end, thus insuring its normal position, as shown in the drawings. A latch 92½, fulcrumed upon frame 2, is provided to enable the attendant to secure the lever 82 down, if he so desires, without the necessity of himself holding it.

A foot lever or treadle 85 reaches across the inside of frame 2, being fulcrumed on a shaft 86, reaching through the frame 2 and having an arm 87 attached thereto upon the outside of frame 2. Therefrom a rod 88 reaches upward and is attached to a push-lever 89, fulcrumed upon the bracket 58 at 90. The push-lever 89 has a projection 91 from one side of its outer arm, the projection 91 engaging the rod 72. A spring 92, attached to the treadle 85 and frame 2, tends to bring it to its normal position after being pushed down and released by the operator.

Having now described the construction of my mechanism, I will describe its operation.

A belt from the source of power being applied to the pulley 57 will cause it to revolve continuously and uninterruptedly as long as the power is so applied. The part 62 of the clutch running upon a feather 50½, let into

the shaft 50, will also revolve with the shaft and at the same time be free to move along the shaft. The part 61 of the clutch is secured to the pinion 67, and both run free on shaft 50, or the shaft may revolve and not revolve the pinion 67 or the attached disk 66 or the part 61 of the clutch, except when the part 62 of the clutch is forced into 61 and has frictional contact therewith. It will be noticed that the bent yoke-lever 63 engages trunnions 65 on part 62 of the clutch and that back of the fulcrum 64 the bent yoke-lever 63 rests upon the projection 81 of rod 72, which passes up and connects to the lever 69, which is moved by the cam 25. This mechanism is for automatically stopping the machine (except the pulley 57, shaft 50, and part 62 of the clutch) after one revolution has been performed, thereby enabling the workman to adjust his sheet of metal in position for the next revolution, causing the downward stroke of the slide 31 and its attached die 35. During the revolution the part 62 of the clutch is pushed into frictional and driving contact with the part 61 of the clutch and so held by the weight 80 pulling down the inner end of the bent yoke-lever 63, thus causing its upper or yoke end to force the part 62 of the clutch into the part 61, revolving the pinion 67, disk 66, spur gear-wheel 26, cam 25, and shaft 10, and causing the cranks 17 18 to descend, moving down the connecting-rods 27 28, slide 31, and die 35. The cam 25, as the mechanism is revolved and after the die 35 has done its work, commences to raise the lever 69 and its attached rod 72, and in consequence of the lug 81 lifting the inward end of the bent yoke-lever its upper or yoke end disengages the part 62 of the clutch from the part 61, thus throwing off the power and also causing the projection 79 to push apart the extensions 78, and, forcing the plates 76 against the disk 66, acts as a brake to overcome the inertia of the moving parts and stops them. This occurs every revolution, the machine automatically stopping after each revolution, unless the workman applies the means provided to overcome the automatic mechanism and thereby cause the machine to continue to run as long as he engages this antiautomatic mechanism, which I now describe.

The foot-treadle 85, placed across the inside of frame 2 at its lower part and convenient for the attendant, is fulcrumed upon a shaft 86, reaching through frame 2 and having a lever 87 upon the outside. This lever extends upward and is coupled to a push-off lever 89, fulcrumed upon the bracket 58 at 90. A projection 91 from one side of the lever 89 is in position for contact with rod 72. A spring 92 connects treadle 85 to frame 2, holding this mechanism disengaged and inoperative. The attendant by pressing down 85 causes the projection 91 to force rod 72 aside, thus disengaging lug 81 from contact with and from holding bent yoke-lever 63, thus allowing the

weight 80 to pull the lever down, and thereby, as heretofore described, closing the clutch and starting the machine. If the pressure upon 85 is but momentary, only one revolution will be made, but if the pressure is continuous revolutions will continue during such pressure. I have provided means by which the attendant can cause the revolving mechanism to operate for any part of the stroke of the slide and its die. A hand-lever 82 is fulcrumed at 83 on bracket 58, the direction of this part from the fulcrum being upward and outward. From the fulcrum the opposite way it is nearly level, and is long enough to touch the under side of the bent yoke-lever 63, and has at its outer end a weight 84 suspended therefrom, the weight forcing the handle end against the pin 84, keeping the lever inoperative, as shown in the drawings. It being desired to cause the parts to perform any part of a revolution, the handle of 82 is grasped and pulled down, the machine first having been started by pressure on treadle 85. This disengages the clutch, engages the friction-plates to the disk, and holds the mechanism at the desired position, and any part of a revolution can be made, this being essential in adjusting the dies to one another. By hooking the latch 92 $\frac{1}{2}$ over the lever 82 the clutch cannot be engaged or the machine started, a precaution necessary when adjustments of dies are being made.

Having now described the mechanism I at present employ, and having so illustrated it that those skilled in the art can thoroughly comprehend it, I hereby reserve the right to such variations of construction as will be comprised within equivalent mechanism and that accomplish practically what I have set forth.

I claim—

1. In a plate-forming machine, a framework therefor having independent ends joined by an independent tie, a double-crank shaft carried by the frames and the tie, a cam and a gear upon the shaft, a bracket secured to one frame, a main shaft carried by the bracket, a pulley upon the shaft, a friction-clutch upon the shaft consisting of two parts one part revolving with the shaft but free to slide along the shaft, the other part revolving freely upon the shaft and attached to a pinion engaging the gear of the crank-shaft, a disk upon the hub of the pinion, means to connect a weight to the sliding part of the clutch to cause it to engage and revolve the clutch and pinion, and means from the cam upon the crank-shaft to automatically lift the weight, engage friction-plates with the disk, throw the parts of the clutch out of contact and automatically stop the machine at each stroke, substantially as described.

2. In a metal-bending machine, a framework therefor carrying a multiple-crank shaft having a cam and a gear thereon, means to connect the cranks of the shaft with a slide guided in the frames, a main shaft carried by a bracket upon the frame and having a

- pinion engaging the gear of the crank-shaft, a clutch controlling the pinion, a pulley upon the shaft, a disk upon the pinion, means to force the clutch into engagement by weights, means on the crank-shaft to lift the weights disengage the clutch and apply friction to the disk, automatically at each stroke, and means to disengage the weight-lifting mechanism by hand, substantially as described.
3. In plate-forming machines, means to fixedly connect upper dies to a multiple-crank shaft, lower dies secured on an adjustable table, an independent driving-shaft having means for engagement with the crank-shaft controlled by gravity, means upon the crank-shaft to overcome the gravity, apply friction and stop the upper die automatically at each stroke, and means for the operator to disconnect the automatic mechanism at will, to allow the continuous pressing of the dies, substantially as described.
4. In a cornice-machine, upper dies fixed upon a reciprocating slide worked by a shaft thereto attached by connections of fixed length, lower dies fixed upon a table having means for its adjustment toward or from the upper dies, means to automatically stop the movement of the upper dies after each depression, means to disengage the automatic stopping mechanism, means to disengage the driving mechanism from the pressing mechanism at the will of the attendant, and means to raise or lower the table and the lower dies from the driving mechanism of the machine and at the will of the operator, substantially as described and set forth.
5. In a plate-forming machine, a slide reciprocally driven and carrying a die, a table arranged for upward or downward movement and carrying a die, means for the movement of the table by the power supplied to the machine, and means to lock the table-moving mechanism, substantially as described.
6. In a cornice-forming machine independent end frames united by an independent tie, a multiple-crank shaft suspended from the tie and carried by the frames, a main shaft

having driving mechanism engaging the mechanism of the crank-shaft, a slide moved by the crank-shaft and carrying a die, a girder-table carrying a die and having means for its adjustment when required for different depths of cornices, a cam upon the crank-shaft, mechanism from the cam to the stopping mechanism of the main shaft automatically operated at each stroke, means within the control of the operator to disengage the automatic mechanism and means to so lock the disengaging mechanism that revolutions of the crank-shaft may be made until the disengaging-mechanism lock is released by the operator, substantially as described.

7. In a plate-forming machine, a driving-shaft, a pulley thereon, a crank-shaft having a die connected thereto and by it moved, means on the crank-shaft and thereto connected for its driving from the main shaft, automatic mechanism to disconnect the power and stop the crank-shaft after a single revolution, and means by which the operator can throw off or on the automatic mechanism at will to start and stop the crank-shaft within a desired portion of its stroke for the purpose of adjusting the dies, substantially as described.

8. In a plate-forming machine, a slide having upward and downward movement from an attached multiple-crank shaft and having fixed connections thereto, a die thereto attached having multiple projections entering receptacles formed therefor within the slide, and having at right angles therewith connected double ended and threaded locking-screws, having central concave necks, adapted to hold the die to its place by means of engaging its projections as aforesaid, substantially as described.

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

GEORGE HENDERSON.

Witnesses:

SAML. B. S. BARTH,
R. C. WRIGHT.