C. A. MYERS.

STAMPING AND PUNCHING MACHINE.

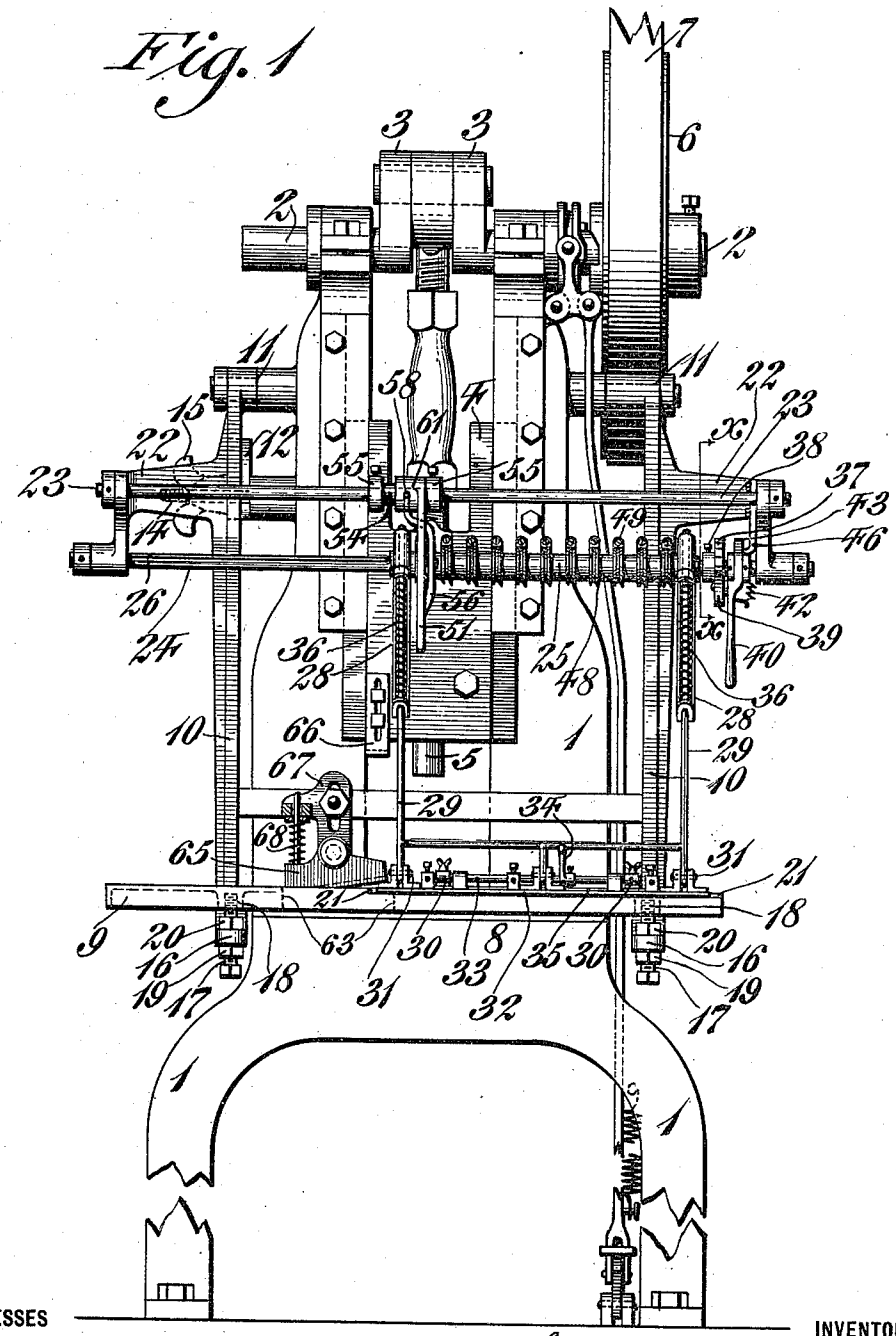
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974,695.

Patented Nov. 1, 1910.

4 SHEETS—SHEET 1.

Fig. 1



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4 SHEETS—SHEET 2.

Fig. 2.

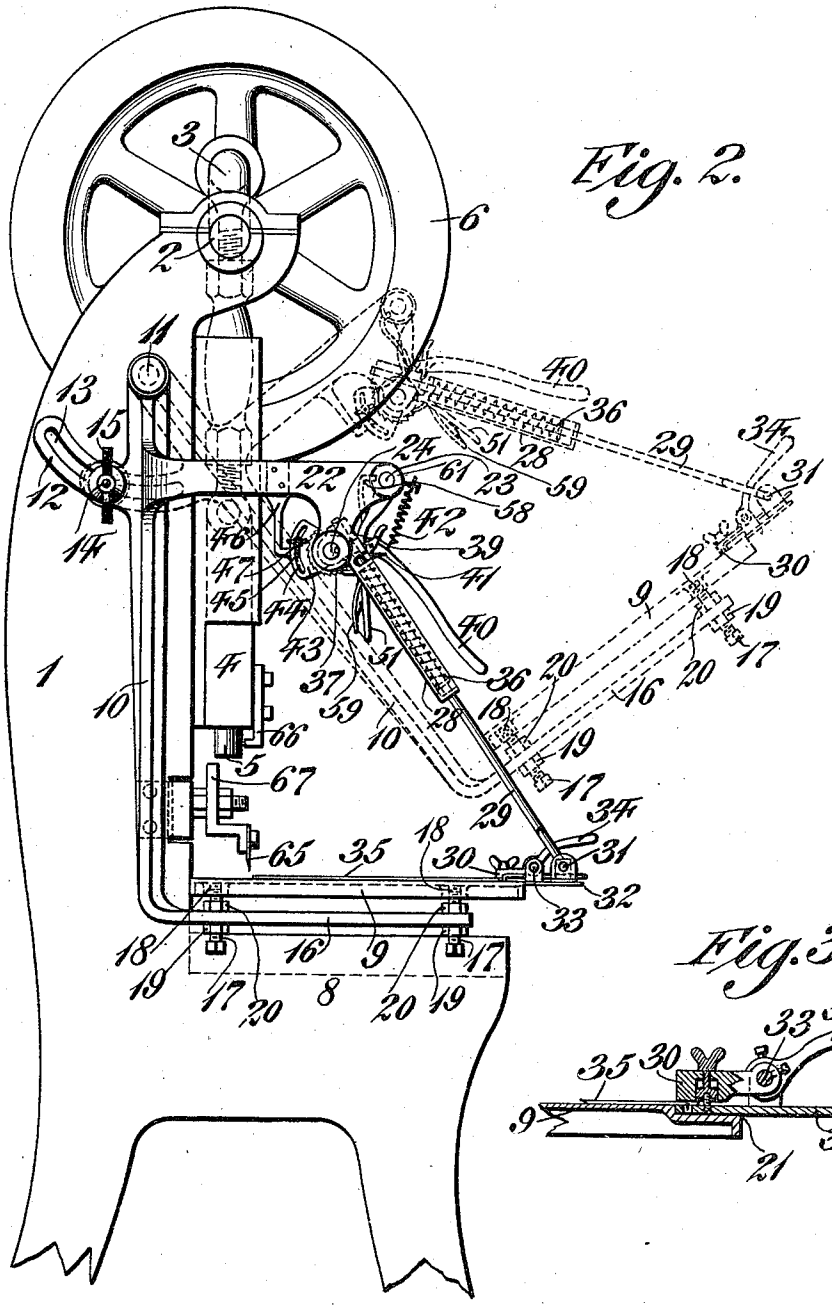


Fig. 3.

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4 SHEETS—SHEET 3.

Fig. 4.

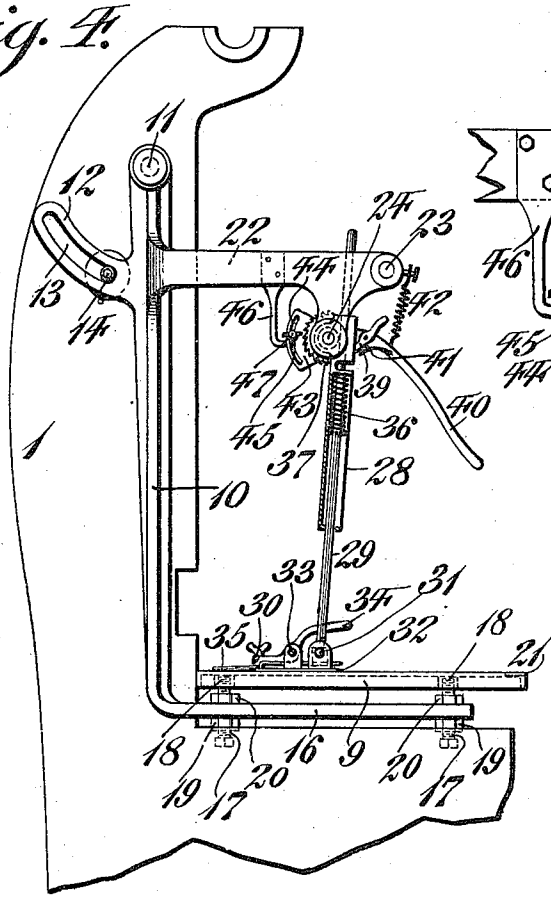


Fig. 5.

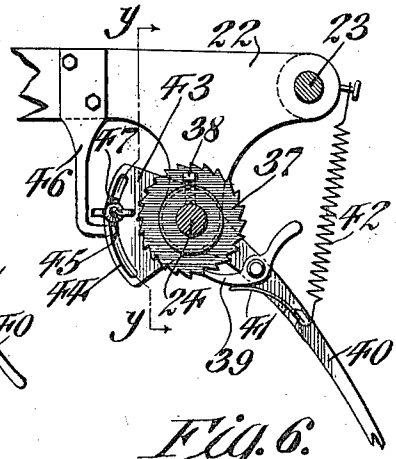


Fig. 6.

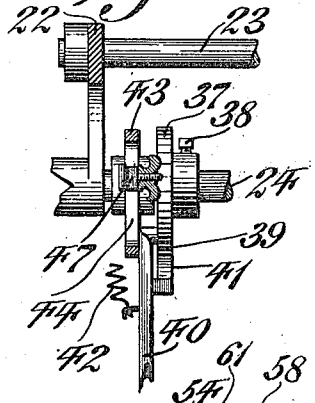


Fig. 7.

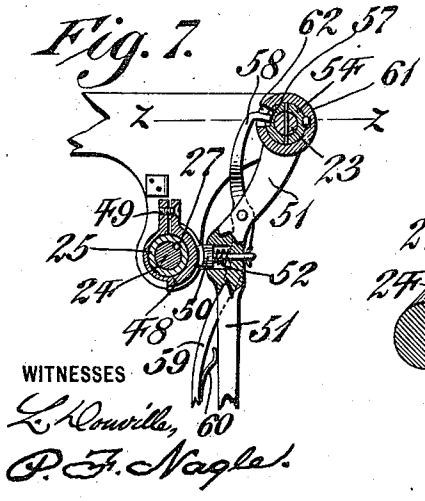


Fig. 9.

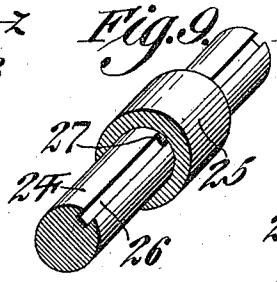


Fig. 8.

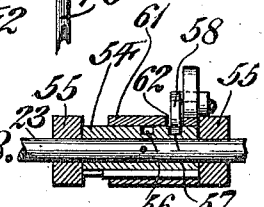
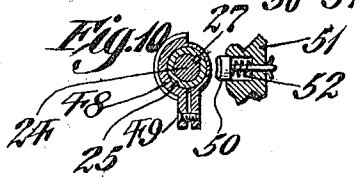


Fig. 10.



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4 SHEETS—SHEET 4.

Fig. 11.

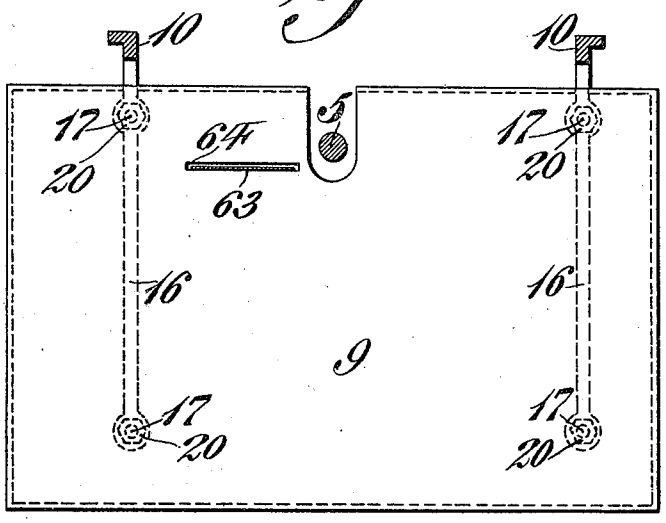


Fig. 12.

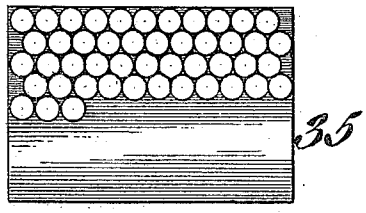
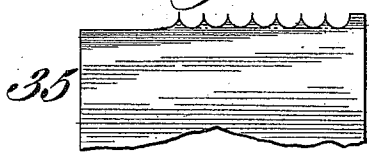


Fig. 13.



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UNITED STATES PATENT OFFICE.

CLARENCE A. MYERS, OF CAMDEN, NEW JERSEY.

STAMPING AND PUNCHING MACHINE.

974,695. Specification of Letters Patent. **Patented Nov. 1, 1910.**

Continuation of application Serial No. 508,599, filed July 20, 1909. This application filed June 10, 1910. Serial No. 566,226.

To all whom it may concern:

Be it known that I, CLARENCE A. MYERS, a citizen of the United States, residing at Camden, in the county of Camden and State of New Jersey, have invented a new and useful Stamping and Punching Machine, of which the following is a specification.

This application sets forth the same broad principles of invention as were disclosed in an earlier allowed and forfeited application filed by me on the 20th day of July, 1909, Serial No. 508,599, allowed Dec. 10, 1909.

My invention relates to a new and useful stamping and punching machine and consists of means whereby ready access may be had to the dies and to the other working parts of the machine and which eliminates the necessity of dismembering and reassembling certain parts for this purpose.

It further consists of means whereby a sheet of material is fed to the punching mechanism, is accurately positioned therebeneath and which provides for longitudinal movement, step-by-step, across the machine and for lateral movement, step by step, toward the machine.

It further consists of novel means for swingingly mounting the gripping means.

It further consists in swingingly mounting the table upon the machine.

It further consists of other novel features of construction, all as will be hereinafter fully set forth.

For the purpose of illustrating my invention, I have shown in the accompanying drawings a form thereof which is, at present, preferred by me since the same has been found, in practice, to give satisfactory and reliable results, although I desire it understood that changes may be made in the construction, that the arrangement of the parts may be varied, and that other instrumentalities may be employed which will come within the scope of my invention, and I do not therefore desire to be limited to the precise arrangement and organization of these instrumentalities as herein shown and described, but desire to make such changes as may be necessary.

Figure 1 represents a front elevation of a stamping machine, embodying my invention. Fig. 2 represents a side elevation of the same showing, in dotted lines, the position to which the table may be moved. Fig. 3 represents on an enlarged scale a sectional view showing the gripping means and a portion of the table in detached position. Fig. 4 represents a side elevation of a portion of the mechanism shown in Fig. 2 with some of the parts in different positions from that shown in said Fig. 2. Fig. 5 represents a sectional view on line *x*—*x*, Fig. 1, showing a detailed portion of one of the feed mechanisms on an enlarged scale. Fig. 6 represents a sectional view on line *y*—*y*, Fig. 5. Fig. 7 represents a sectional view of the device for effecting the step-by-step movement of the frame. Fig. 8 represents a sectional view on line *z*—*z*, Fig. 7. Fig. 9 represents a perspective view of a portion of the spindle employed, showing a portion of the sliding member or sleeve thereon. Fig. 10 represents a sectional view of a portion of the mechanism shown in Fig. 7 in a different position therefrom. Fig. 11 represents a plan of the table employed. Fig. 12 represents a blank, partially stamped, showing the staggered relation of the punches. Fig. 13 represents a portion of the plate showing a portion of the same after the trimming action.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings:—1 designates the frame of a stamping or punching machine, the same being of any suitable construction and supported in any suitable or desired manner, it being understood that the parts of the machine are connected and mounted in any suitable manner, said frame being provided with a suitably driven shaft 2 provided with a crank 3 adapted to operate a cross-head 4 which carries the punch or punching tool 5, whereby the latter will be suitably reciprocated, in order to stamp a sheet of metal or the like, it being understood that any suitable tool may be inserted in said cross-head 4.

It will be understood that the shaft 2 is driven in any suitable manner and in the present instance I have shown the same carrying a pulley 6 which is driven by a belt 7 actuated from any suitable source of power.

8 designates a suitable bed on the frame 1 above which is removably positioned the

table 9, and which is swingingly supported with respect to the machine. In the present instance the table 9 is carried by the side frames or arms 10 which are pivotally mounted on the main frame 1, in the present instance upon the studs 11, whereby the table 9 may be swung away from the machine and will assume a position as indicated in dotted lines in Fig. 2, in order that access to the punch and mechanism of the machine may be had. Any suitable means for locking the table 9 and the side frames or arms 10 may be employed. In the drawings I have shown a bracket or arm 12 provided with a suitable slot 13 with which coöperates the means for locking the table in adjusted positions, said means being shown as a bolt 14 carried by the frame 1, the said bolt being provided with means for engagement with the bracket 12 in order to lock the same with respect to the frame 1, whereby the table will be locked. I have shown in the present instance a wing nut 15 for this purpose.

It will be understood, if it is desired to raise the table 9 or swing the same outwardly into the position shown in dotted lines in Fig. 2, that by loosening the nut 15, the table 9 may be raised to the desired position and the nut 15 may be tightened again, whereby the table and the parts carried thereby are fixedly held, thus permitting changing of the punching tool, parts of the mechanism, or adjustments as required.

It will be noted that each of the side frames or arms 10 is provided with an extension 16 which in the present instance passes beneath the table 9 and which is provided with means for attachment to the table 9 in order to maintain the same in proper position. As here shown, I have provided the bolts 17 which engage with threaded openings 18 in the table and cooperate with the nuts 19 and 20 for locking the bolts 17 in their proper position. It will be noted, more particularly from Fig. 3, that I have formed a depression 21 adjacent the outer edge of the table 9 for reasons as will be hereinafter set forth.

22 designates an arm carried by each side frame 10 and forming a support for a rod 23 and for a rotatably mounted spindle 24, said rod and spindle being suitably located with respect to each other, the latter having mounted thereon a sleeve or member 25 which is suitably connected with said spindle in order that longitudinal movement of said member on said spindle is permitted but rotary movement, between these parts, is prevented. Any suitable means for accomplishing this result may be employed and in the present instance I have shown a groove 26 in the spindle 24 in which is situated a suitable number of rollers 27 mounted upon the sleeve 25 in order that the said sleeve 25 can freely move longitudinally on said spindle but no relative rotary movement between these parts is permitted.

Carried by the sleeve or member 25, as here shown at each end thereof, is a hanger 28 which is, in the present instance, secured to the said sleeve or member 25, the latter and said hangers together forming a frame. Movably carried by each of the hangers 28 is a pin or bar 29, one of each of the same, in the present instance, being suitably guided by each of the hangers in order to permit relative movement therebetween, and each of said pins or bars adjacent its lower end has pivotally connected therewith the gripping means 30, whereby the latter may be moved. As here shown, these pins or bars are connected, by means of a pivot pin 31, with a plate 32 which suitably supports a rod 33 carrying the gripping means 30, said rod 33 having connected therewith an operating lever 34, whereby the said gripping means 30 may be opened and closed, in order to engage with and release the sheet of metal 35, as best understood from Fig. 3. It will be noted from this figure that the support 32 for the gripping means 30 is adapted to be placed and rest in the depression 21 in the table 9, when it is desired to clamp or grip the sheet of metal 35, in order that the jaws of the gripping means will be in line with the surface of the table 9 so that the sheet of metal will be suitably supported with respect to the gripping means at that time.

36 designates a spring for each of the pins or bars 29, one end of a spring being in suitable connection with its bar 29 and the opposite end being in suitable engagement, in the present instance, with a suitable portion of hanger 28, said spring permitting yielding movement between the bar 29 and its hanger 28, but it will be understood that the complete withdrawal of a bar from its hanger is suitably prevented.

The yielding movement of the parts just described is provided to permit the step-by-step inward movement of the free end of the hangers which carry the gripping means, since the said free ends of the hangers will move in the arc of a circle, and by this means I provide for the proper relative movement of these parts to permit feeding to the punching tool. Suitable means for providing for this step-by-step inward movement and for holding the hangers and grippers in their different position is provided, and as here shown, is accomplished by means of a ratchet 37 suitably mounted or connected with the spindle 24, in the present instance being secured thereto by set screw 38, and the teeth of said ratchet being

adapted to be engaged by a pawl 39 suitably mounted on a lever 40, a suitable spring 41 bearing against said pawl 39 serves to hold the same in and force the same into engagement with the teeth of said ratchet. The lever 40 is freely mounted upon the spindle 24 and is in suitable connection with a spring 42 which is also in engagement with a suitable point, in the present instance with the arm 22, in order to hold the lever 40 in its elevated or normal position and to return the same thereto after being actuated. Carried by the lever 40, in the present instance, is a plate 43 provided with a suitable slot 44 extending into which is an abutment 45 carried by a bracket 46 suitably supported, as here shown, carried by the arm 22.

47 designates a stop adjustably mounted upon the plate 43 and which is adapted in one position of the lever 40 to contact with the abutment 45 to limit the movement of said lever.

It will be apparent that when the parts are in the position seen in Fig. 5 the lever 40 is held in its normal position with the pawl 39 in engagement with one of the teeth of the ratchet 37 and with the stop 47 contacting with the abutment 45 whereby the spindle 24 and the sleeve carried thereby will be held in this position. By lowering the free end of the lever 40, and overcoming the tension of the spring 42, the pawl 39 will rotate the ratchet 37 a suitable distance until the abutment 45 strikes the end wall of the slot 44 and when the lever 40 is released the spring 42 returns the same to its normal position, the pawl 39 in this movement freely riding the teeth of the ratchet 37, until the lever 40 has reached its normal position, at which time the pawl 39 will engage with another tooth of the ratchet 37 and lock the spindle 24 and the sleeve 25 in their adjusted positions.

By this means, proper feeding movement is imparted to the gripping means 30 since the free ends of the hangers 28 carried by the sleeve 25 will be swung toward the stamping machine, carrying with them the pins or bars 29 and consequently the gripping means 30, the said pins or bars 29 having sliding movement with respect to the hangers 28 as previously described. I thus provide a uniform step-by-step action, whereby the material is suitably fed to place the same properly in position beneath the punching mechanism at each step and the parts will be locked or held in their adjusted positions, as previously stated.

I have now described the means for feeding the material laterally with respect to the punching machine by the step-by-step movement in order that different rows of holes may be punched in the material and I will now describe the means for imparting a longitudinal movement to the material for this purpose.

In Fig. 1, I have shown the frame, formed of the sleeve 25, the hangers 28 and parts carried thereby, at the right hand side of the machine, which is the proper position thereof, in order that the strip of material will be properly positioned with respect to the punch for the first punching operation and the frame is adapted to have movement step by step to the left from the position seen in Fig. 1, so that an uncut portion of the material is presented to the punching tool at each operation thereof. I preferably desire to move the frame by hand manipulation, although any suitable means for accomplishing this result may be employed and in order to stop the frame at predetermined points in this movement longitudinally across the machine, I mount a plurality of collars or stops 48 upon the sleeve 25, in the present instance said stops being adjustably mounted thereon, in order that they may be suitably spaced apart on the sleeve 25, said collars being shown as split and the parts being suitably secured together by screws 49 in order to tighten the same properly upon the sleeve 25. Suitable means for coöperating with the stops is provided and as here shown I provide a stop member or dog 50 carried by an arm 51 adjustably mounted upon the rod 23, said dog being resiliently actuated, in the present instance by a spring 52 bearing thereagainst in order to hold the same in and return it to its normal position. The outer or engaging face of said dog is preferably tapered in order that it will more easily be actuated to engage with and to release the stops or collars 48. It will be understood from this that as the frame is moved or shifted to the left the same will be halted or stopped at a suitable distance by the stops 48 successively engaging with the stop member or dog 50 and that the dog releases the collar 48 with which it is in engagement, when the operator exerts sufficient power therefor, and permits movement of the frame until the next successive collar 48 is engaged by said dog 50, whereby it will be understood that the frame advances the distance of one collar and is stopped or halted, so that a step-by-step movement laterally across the machine is provided in order to properly position the material beneath the punch tool in order to present an uncut portion of the material to the action of said tool.

As is more clearly shown in Figs. 7 and 10, I preferably form one side of the collars 48 narrower than the other, in order that by turning the collars into the position seen in said Fig. 10 the same will be out of line of

the dog 50 and so cannot be engaged by the same, should it be desired to pass any of the collars, depending upon the character of the work to be done.

In punching and stamping work it is essential that as much of the material be utilized as possible, in order to prevent waste, and it is preferable therefore to provide means for starting the operation of the punching tool upon the material at different points thereon for each row of punches in order to stagger the relation of the punches with respect to each other, as more clearly understood from Fig. 12, and it is therefore preferable to provide means to position the strip of material for this reason, whereby the initial position of the material with respect to the punching tool may be varied for each row. I have provided mechanism for producing this adjustment which, as here shown, consists of a sleeve 54 secured to the rod 23, in the present instance, being held between the collars 55 secured to said rod, said sleeve being provided with two slots or openings 56 and 57, either of which is adapted to receive a dog 58 carried by a lever 59 pivotally mounted upon the arm 51, said lever being suitably actuated by a spring 60 in order to hold the dog 58 in engagement with whichever of the slots or openings 56 or 57 with which it is in engagement, it being noted that the said arm 51 is provided with a hub 61 slidingly mounted upon the sleeve 54, said hub being provided with a suitable opening 62 through which the dog 58 passes in order to enter either of the openings 56 or 57 so as to lock the said hub with respect to the sleeve 54, depending upon which slot or opening 56 or 57 it is desired to have the dog 58 enter. It will thus be apparent that by pressing upon the lever 59 the dog 58 is removed from the opening 56 or 47, whichever it is in engagement with, and the hub 61 can be moved along the sleeve 54 to cause the dog 58 to engage with the other opening 56 or 57.

As shown in Fig. 1 it will be seen that the hub 61 is so positioned that it is in its right hand position and in this position the dog 58 is in engagement with the opening 57. In this position the dog 50 is in engagement with the first collar 48 upon the sleeve 25 in order that the material will be positioned with respect to the punching so that the first row of openings or holes may be punched, as seen in Fig. 12. By removing the dog 58 from its engagement with the opening 57 and by sliding the hub 61 to the left of its position seen in Fig. 1, the dog 58 will be caused to engage with the opening 56 and the sleeve 25 and hangers carried thereby can be moved a corresponding distance in order that the material will be so presented, to the punching tool 5, that the second row of openings may be punched with the initial punch slightly to the right of the initial punch of the first row of holes, so that this row will be in staggered relation with respect to the first row.

It will be understood with respect to Fig. 13 that after a row of punches have been cut that it is preferable to provide some means for removing the ragged edge from the material remaining and for this purpose I have located a jaw member 63 in suitable relation with respect to the opening 64 in the table, while above the same and in suitable position with respect thereto is a pivoted jaw or cutting means 65 which is suitably positioned with respect to an actuating means or plate 66 adjustably carried or supported by the cross head 4 in order that, as the punching tool 5 is reciprocated, the said plate 66 will engage with the jaw 65 in order to operate the same to cut the material, which latter will be moved to a position between the cutting means. In the present instance the jaw 65 is pivoted to a bracket 67 adjustably supported and is engaged by a spring 68 to hold the same in its normal position and return the same thereto after operation.

From the above it will be seen that every downward stroke of the cross-head 4 produces a shearing action upon the strip of material to remove the ragged edge thereof. It will be further apparent that after a punching operation extending the width or length of a strip of material, that the cutting mechanism has suitably trimmed the ragged, uneven edge and the material may thus be fed forward accurately into the position for the next punching operation.

It will of course be understood that the punching machine is provided with suitable mechanism for the proper operation of the same

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

1. The combination of a stamping machine, with a table swingingly mounted thereon, and means to feed a strip of material along said table and toward said machine.

2. The combination of a stamping machine, with a table swingingly mounted thereon, means to feed a strip of material toward said machine, and means to feed said strip of material angularly to said first feeding movement.

3. The combination of a stamping machine, with a table swingingly mounted thereon, a frame carried by said table adapted to support a strip of material, and means to effect a step by step movement of said frame.

4. The combination of a stamping ma-

chine, with a table swingingly mounted thereon, of a frame carried by said table adapted to engage a strip of material, means to feed said strip of material toward said machine, and means to effect a step by step movement of said frame.

5. The combination of a stamping machine with a frame swingingly mounted thereon carrying a table, a rod carried by said frame, a plurality of hangers movably mounted on said rod, gripping members secured to said hangers for engaging a strip of material, and means to effect a partial rotation of said hangers.

6. The combination of a stamping machine with a frame swingingly mounted thereon carrying a table, a rod carried by said frame, a plurality of hangers movably mounted on said rod, gripping members secured to said hangers for engaging a strip of material, means to effect a partial rotation of said hangers, and means to slide said hangers on said rod.

7. The combination of a stamping machine with a table swingingly mounted thereon, of means for feeding a strip of material toward said machine, and means for cutting said strip of material during a stamping operation.

8. The combination of a stamping machine, with a table swingingly mounted thereon, of means for feeding a strip of material toward said machine, shearing mechanism, and means actuated by said stamping machine for operating said shearing mechanism.

9. The combination of a stamping machine with a table swingingly mounted thereon, means for locking said table in its proper position, and means for feeding a strip of material along said table and toward said machine.

10. The combination of a stamping machine with a table, a spindle suitably mounted adjacent thereto, a plurality of hangers movably mounted on said spindle, gripping members secured to said hangers for engaging a strip of material, a plurality of stops on said spindle, and means coöperating with said stops to effect a step-by-step movement of said hangers.

11. The combination of a stamping machine with a table, a spindle suitably mounted adjacent thereto, a sleeve carried by said spindle, a plurality of hangers secured to said sleeve, gripping members secured to said hangers for engaging a strip of material, stops adjustably secured to said sleeve, and means coöperating with said stops whereby a step-by-step movement of said hangers is effected.

12. The combination of a stamping machine with a table, a spindle suitably mounted adjacent thereto, a sleeve slidingly mounted on said spindle, hangers secured to said sleeve and forming therewith a frame, gripping members carried by said hangers for engaging a strip of material, and means to effect a partial rotation of said frame.

13. The combination of a stamping machine with a table, a spindle adjacent thereto, a frame slidingly mounted on said spindle, gripping members carried by said frame for engaging a strip of material, a plurality of collars adjustably mounted on said frame, a stop suitably mounted adjacent said spindle for successively engaging said collars, a shearing mechanism, and means actuated by said stamping machine for operating said shearing mechanism.

14. The combination of a stamping machine with a table, a member slidingly mounted adjacent thereto, a hanger carried by said member, a gripping means carried by said hanger for engaging a strip of material, a plurality of stops on said member, and means coöperating with said stops to effect a step-by-step movement of said hanger.

15. The combination of a stamping machine with a table, a member slidingly mounted adjacent thereto, a hanger secured to said member and forming therewith a frame, gripping members carried by said hanger for engaging a strip of material, and means to effect a partial rotation of said frame for feeding the material toward the machine.

16. The combination of a stamping machine with a table, a support adjacent thereto, a member movably mounted on said support, stops on said member, means coöperating with said stops to effect a step-by-step movement of the member, gripping means, a support therefor carried by said member, and means for moving the free end of said gripping-means support toward the machine.

17. The combination of a stamping machine with a table, a support adjacent thereto, a member movably mounted on said support, stops on said member, means coöperating with said stops to effect a step-by-step movement of the member, gripping means, a support therefor carried by said member, and means adapted to be operated to move the free end of the gripping-means support toward the machine and for holding said support and gripping means in adjusted positions.

18. The combination of a stamping machine with a table, a support adjacent thereto, a member movably mounted on said support, stops on said member, means coöperating with said stops to effect a step-by-step movement of the member, a swinging support carried by said member, means for moving the free end of said swinging support toward the machine, gripping means,

and a yielding and extensible connection between said gripping means and said swinging support.

19. The combination of a stamping machine with a table, a support adjacent thereto, a member movably mounted on said support, stops adjustably mounted on said member, means coöperating with said stops to effect a step-by-step movement of the member, a swinging support carried by said member, means for moving the free end of said swinging support toward the machine, gripping means, and a yielding and extensible connection between said gripping means and said swinging support.

20. The combination of a stamping machine with a table, a support adjacent thereto, a member movably mounted on said support, stops on said member, a spring actuated pawl coöperating with said stops to effect a step-by-step movement of the member, a swinging support carried by said member, means for moving the free end of said swinging support toward the machine, gripping means, and a yielding and extensible connection between said gripping means and said swinging support.

21. The combination of a stamping machine with a table, a support adjacent thereto, a member movably mounted on said support, stops on said member, means coöperating with said stops to effect a step-by-step movement of said member, a swinging support carried by said member, gripping means slidingly mounted on said swinging support adapted to engage a strip of material, and a spring interposed between said gripping means and said support.

22. The combination of a stamping machine with a table, a support adjacent thereto, a member movably mounted on said support, stops on said member, means coöperating with said stops to effect a step by step movement of said member, a swinging support carried by said member, gripping means carried by said support adapted to engage a strip of material, and means to effect a step-by-step movement of said swinging support toward the machine.

23. The combination of a stamping machine with a table, a support adjacent thereto, a member movably mounted on said support, stops on said member, means coöperating with said stops to effect a step by step movement of said member, a swinging support carried by said member, gripping means carried by said support adapted to engage a strip of material, and a pawl and ratchet forming a connection between said swinging support and the table, whereby a step-by-step movement of said swinging support is effected toward the machine.

24. The combination of a stamping machine with a table, of a support swingingly supported and mounted for lateral and longitudinal movement with respect to the machine, gripping devices secured to said support adapted to engage a strip of material, and means controlling the movement of said swinging support.

25. The combination of a stamping machine with a table, of a support swingingly supported and mounted for lateral and longitudinal movement with respect to the said machine, a step-by-step mechanism, manually controlled, for effecting longitudinal movement of said swinging support, gripping devices carried by said swinging support adapted to engage a strip of material, and means for controlling the lateral movement of said swinging support.

26. The combination of a stamping machine with a table, a support adjacent thereto, a member mounted on said support and in engagement therewith whereby rotary movement between the parts is prevented and longitudinal movement of said member on said support is permitted, stops on said member, means coöperating with said stops to effect a step-by-step movement of said member, gripping means, a support therefor carried by said member, and means for rotating the support whereby the free end of said gripping-means support is moved toward the machine.

27. The combination of a stamping machine with a table, a support adjacent thereto, a member movably mounted on said support, stops on said member, means coöperating with said stops to effect a step-by-step movement of said member, a swinging support carried by said member, gripping means carried by said support adapted to engage a strip of material, a pawl and ratchet forming a connection between said swinging support and the table whereby a step-by-step movement of said swinging support is effected toward the machine, and means for adjusting the throw of said pawl whereby the length of the step-by-step movement may be varied.

28. The combination of a stamping machine having a punching tool and a table, a member slidingly mounted adjacent thereto, a hanger carried by said member, gripping means carried by said hanger for engaging a strip of material, a plurality of stops on said member, means coöperating with said member to effect a step-by-step movement of said hanger, and means for adjusting the position of said coöperating means whereby the initial position of the material, with respect to the punching tool, may be varied for each row of punches.

29. The combination of a stamping machine with a table guidedly and movably mounted thereon, and means supported by the table to feed a strip of material longi-

tudinally and laterally of said table and of the machine, to feed the material in its relation to the machine.

30. The combination of a stamping machine with a table guidedly and movably mounted thereon, means for locking said table in its operative relation to the machine, and means movably mounted on the table for longitudinally and laterally feeding the material in its relation to the machine.

CLARENCE A. MYERS.

Witnesses:
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