

No. 874,183.

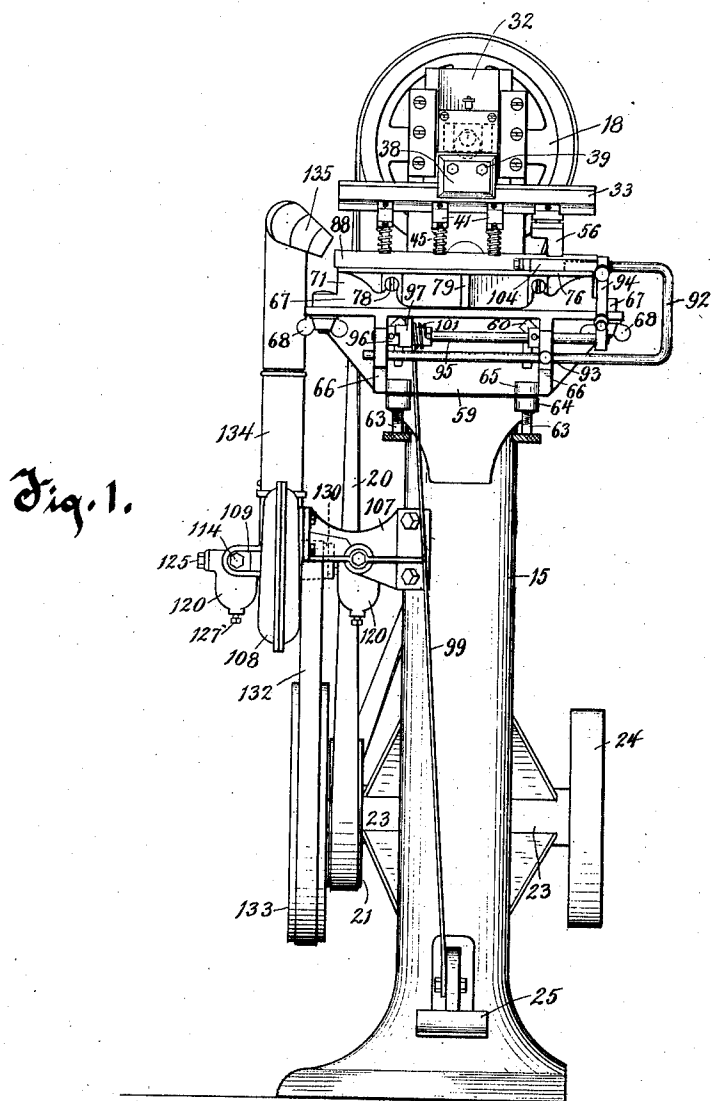
PATENTED DEC. 17, 1907

C. GORDON & H. HART.

POWER PUNCH.

APPLICATION FILED MAR. 24, 1905.

4 SHEETS—SHEET 1.



Witnesses.
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4 SHEETS—SHEET 2.

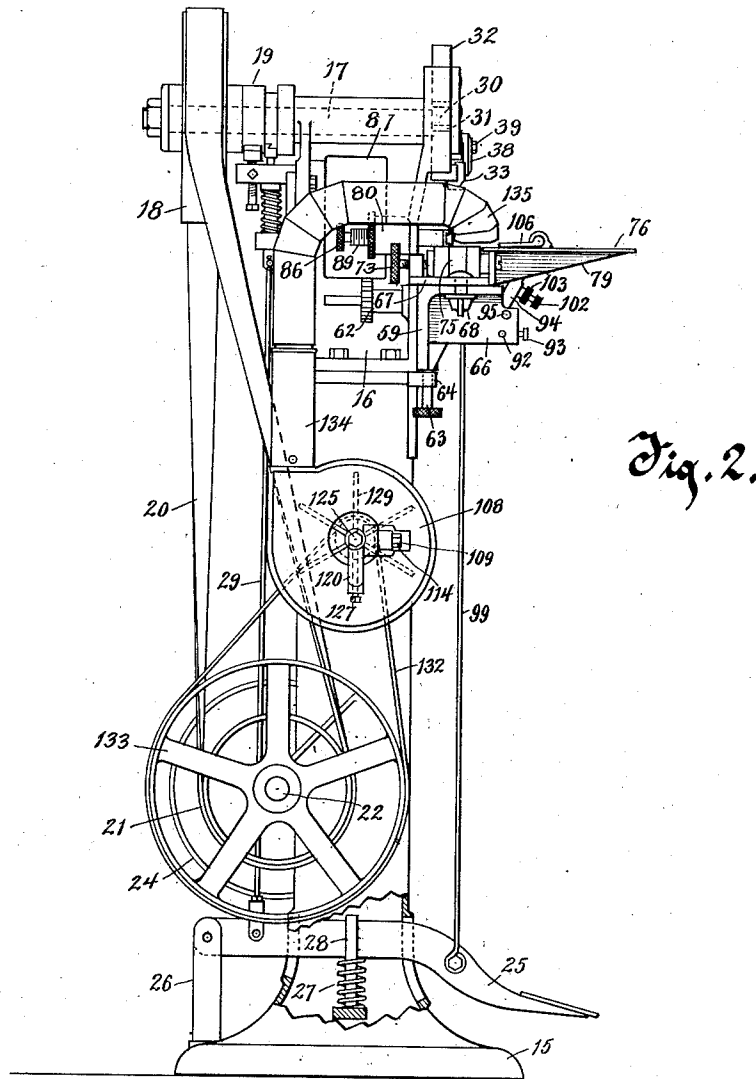


Fig. 2.

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4 SHEETS—SHEET 3.

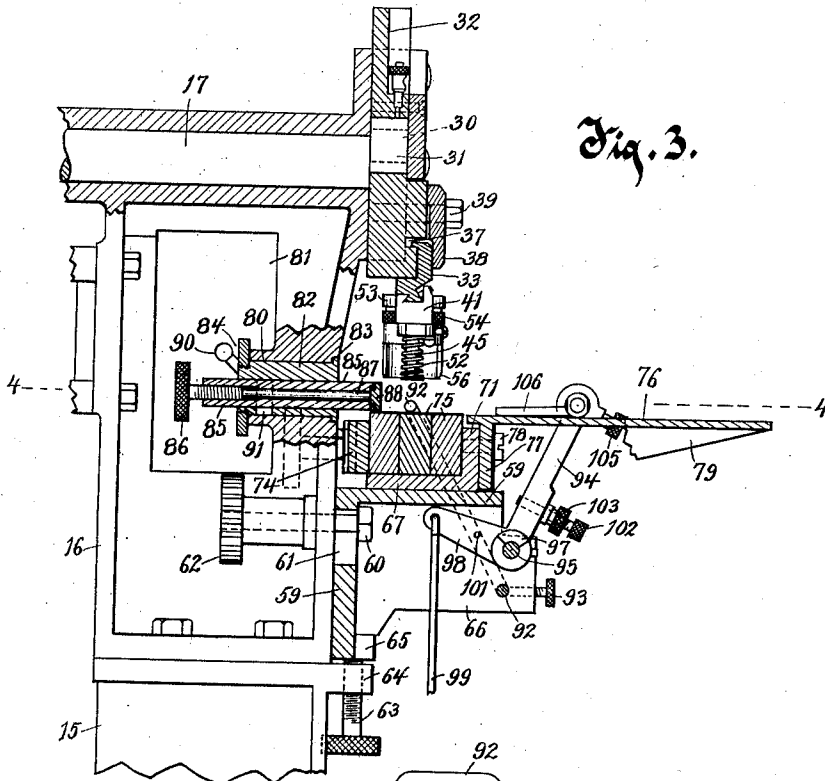
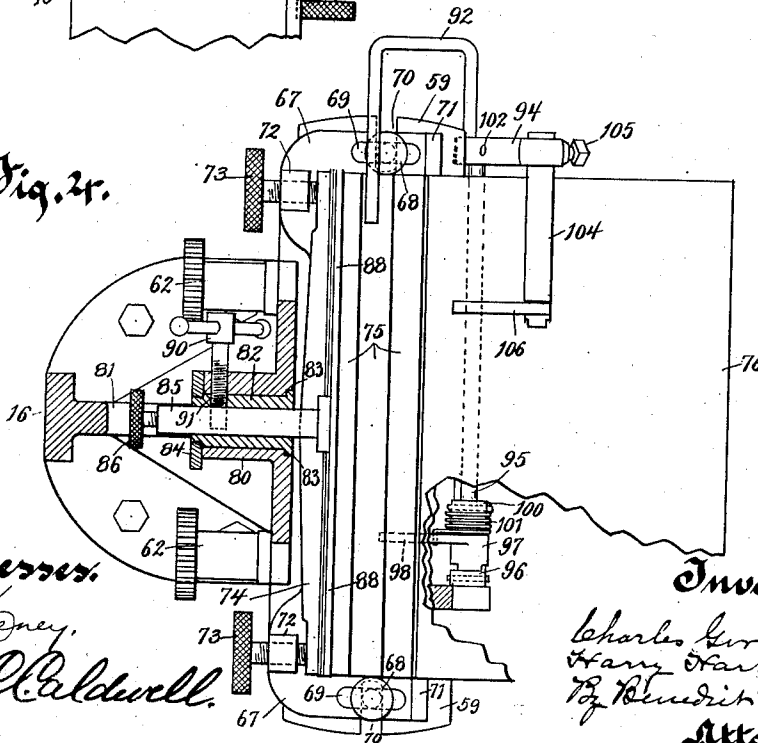


Fig. 3.

Fig. 4.



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4 SHEETS—SHEET 4.

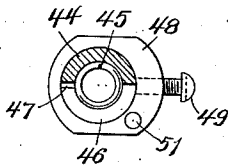
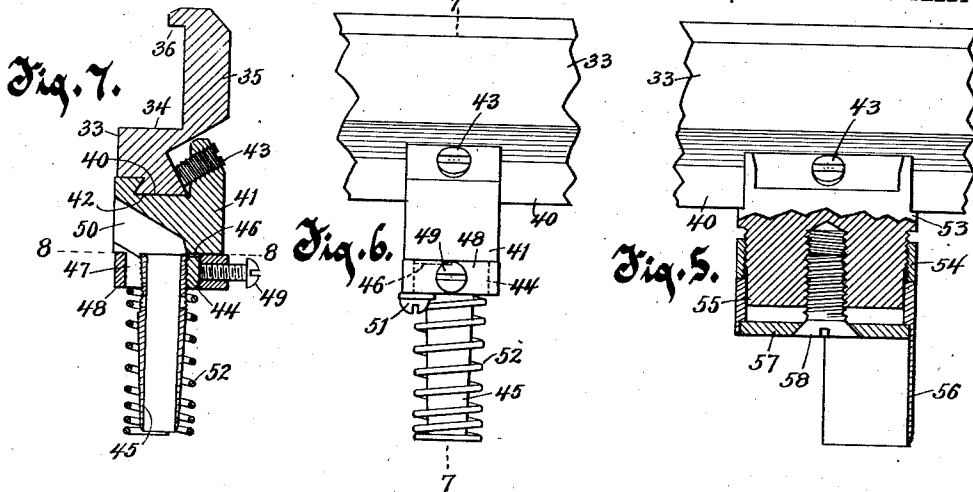


Fig. 8.

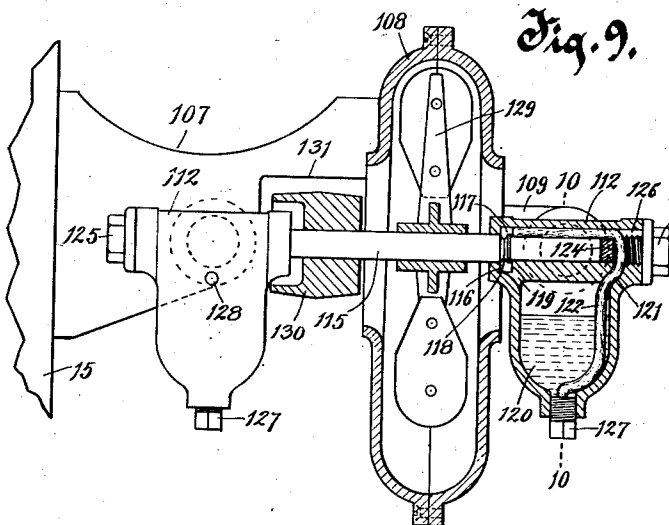


Fig. 9.

Fig. 10.

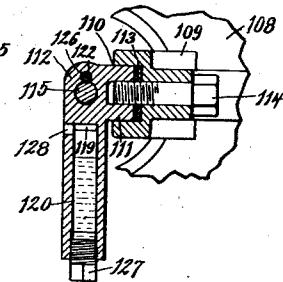


Fig. 11.

124 — 123

Witnesses.

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UNITED STATES PATENT OFFICE.

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POWER-PUNCH.

No. 874,183.

Specification of Letters Patent.

Patented Dec. 17, 1907.

Application filed March 24, 1905. Serial No. 251,763.

To all whom it may concern:

Be it known that we, CHARLES GORDON and HARRY HART, residing in Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Power-Punches, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

10 This invention relates to power punches and especially to power punches designed for punching leather and the like, and has for its object to improve upon the general construction of such devices.

15 Another object of this invention is to produce a power punch with its work table adjustable toward or away from the punching mechanism as well as transversely adjustable to the path of movement of the punching mechanism.

20 Another object of this invention is to improve upon the construction of the punching and cutting devices.

25 Another object of this invention is to provide a means for automatically moving the work to its proper position simultaneously with the starting of the machine in operation.

30 Another object of this invention is to provide suitable adjustable guides of novel construction.

Another object of this invention is to provide a suitably operated blower for keeping the table clear of punchings.

35 Another object of this invention is to provide a novel form of lubricating journal bearing especially adapted for use with blower fans.

40 With the above and other objects in view the invention consists in the device, its parts and combinations of parts as herein set forth and their equivalents.

Referring to the accompanying drawings in which like characters of reference indicate the same parts in the several views:—Figure 1 45 is a front elevation of a power punch embodying this invention; Fig. 2 is a side elevation thereof with parts broken away; Fig. 3 is a sectional elevation of the punch proper the punching table and their associated parts; 50 Fig. 4 is a sectional plan view taken on the plane of line 4—4 of Fig. 3; Fig. 5 is a sectional elevation of an end cutting tool as employed with the power punch of this invention; Fig. 6 is a front elevation of a

punching tool also employed therewith; Fig. 55 7 is a longitudinal sectional view thereof on the line 7—7 of Fig. 6; Fig. 8 is a transverse sectional plan view thereof on the line 8—8 of Fig. 7; Fig. 9 is a vertical sectional view of the blower fan; Fig. 10 is a vertical sectional view of one journal bearing thereof, 60 on the line 10—10 of Fig. 9; and, Fig. 11 is a plan view of the slotted wick plug shown in Fig. 9.

In these drawings 15 represents a standard 65 or supporting base to which is secured a head frame 16 having journaled in its upper part a crank shaft 17 carrying a loose pulley 18 which is adapted to be clutched thereto by a suitable clutch mechanism 19 and is driven 70 by a belt 20 from a pulley 21 mounted on a suitable countershaft 22. The counter shaft 22 is journaled in bearings 23 of the standard or support 15 at right angles to the vertical plane of the crank shaft 17 and is provided 75 with a driving pulley 24 which is adapted to be driven by any suitable source of power to cause the operation of the countershaft 22. The loose pulley 18 is driven from the counter shaft 22 through the belting connection 20, 80 and the clutch 19 is adapted to cause the crank shaft 17 to partake of its motion when a suitable treadle 25 is operated. The treadle 25 is pivoted to an upright post 26 at the rear of the machine base and extends 85 through openings in the standard 15, receiving an upward spring pressure from a coil spring 27 surrounding a split stud 28 through which it moves, and being connected to the clutch mechanism 19 by means of a connecting 90 rod 29.

The crank shaft 17 carries a crank 30 at its front end which fits within a sliding block 31 having a horizontal sliding movement in a ram 32 which has a vertically sliding movement in a guideway of the head frame 16. 95 A punch holder in the form of a bar 33 is firmly secured to the ram 32 by having a top shoulder 34 bearing against the bottom edge of the ram 32 with an upwardly extending 100 flange 35 bearing against the front face of the ram 32 and provided with an inwardly extending groove 37 in the face of the ram 32, the flange 35 being held by a clamping plate 38 105 clamped against it by means of screws 39 passing therethrough and threaded unto the ram 32. The punch holder 35 has a dove

tailed flange 40 with the front undercut deeper than the other and upon which are adapted to be adjustably clamped one or more punch blocks 41 with dove tailed slots 42 in their upper ends to receive the dove tailed flange 40. The upwardly extending front flange of the dove tailed slot 42 has a set screw 43 threaded therethrough to bear upon the front edge of the dove tailed flange 40 and securely clamp the punch block 41 to the punch holder 35.

The punch block 41 has a circular boss 44 on its bottom which has a central screw threaded bore into which is threaded a tubular punch 45. The boss 44 is partially severed from the punch block 41 by a slot 46 extending half way around it between the boss and the punch block, a vertical slot 47 serving to split the boss at one end of the slot 46 so that when a clamping ring 48 is fitted around the boss and the clamping screw 49 thereof is tightened the boss 44 is clamped tightly upon the tubular punch 45 to prevent its working loose. The punch block 41 has an inclined discharge opening 50 to lead the punchings away from the upper end of the tubular punch 45. The clamping ring 48 has a screw 51 threaded therein securing in place a coil spring 52 which surrounds the tubular punch 45 and serves as a stripper therefor.

At one end of the punch holder 41, as here shown, a cutter block 53 is clamped to the dove tailed flange 40 by parts identical with those of the punch block 41, and this cutter block consists principally of a cylindrical boss or body which is threaded at its upper portion and is unthreaded at its lower portion and has a knurled nut 54 threaded on the threaded portion thereof and a cylindrical base ring 55 of a semi-cylindrical cutter blade 56 fitting around the unthreaded portion and bearing on the knurled nut 54. A disk 57 is fitted upon an annular shoulder of the cylindrical base 55 and has a set screw 58 passing therethrough and threading into the body portion of the cutter block 53 to clamp the cutter against the nut 54. The cutter may be adjusted to raise or lower its cutting edge by first adjusting the nut 54 upon the cutter block and then tightening the set screw 54 until the cutter is properly clamped in position.

Beneath the punches and to the front face of the head frame 16 is vertically adjustably clamped a bracket table 59 by means of bolts 60 passing through vertical slots 61 in the vertical portion of the bracket table and through the front face of the head frame 16 with large hand nuts 62 threaded on their ends. Adjusting screws 63 are threaded through forwardly extending bosses 64 at the upper end of the standard or base 15 and bear upon lugs 65 of the bracket table so that when the bolts 60 are loosened by loosening

the hand nuts 62 the bracket table 59 may be moved vertically by turning said adjusting screws 63. The angular bracket table 59 is provided with a pair of vertical webs 66 between its vertical and horizontal portions to strengthen its construction as well as to afford supports for other devices to be later described.

A punching bed plate 67 is seated on the horizontal portion of the bracket table 59 and is adjustably secured thereto by having bolts with winged nuts 68 passing through transverse slots 69 in the ends of the plate 67 and also through longitudinal slots 70 in the ends of the bracket table 59, which arrangement permits of adjustment of the plate 67 on the bracket table 59 in any direction and of securely clamping it in any position to which it may be adjusted. The plate 67 has an upwardly extending flange 71 along its front edge and its rear edge is curved to avoid striking the head frame 16 during the adjustments thereof. Near the ends of its rear edge it is provided with upwardly projecting lugs 72 through which are threaded clamping screws 73 bearing upon a follower plate 74 which is adapted to clamp between it and the flange 71 a number of strips of wood 75 or other soft material which will form a suitable bed or support for the work that will not dull the edges of the cutting tools.

A shelf 76 has a depending flange 77 near its rear edge which is clamped to the flange 71 by screws 78 and the shelf portion overhangs said flange 71 to make said shelf portion practically a continuation of the upper surface of the strips 75, the flange 77 being provided with a web 79 connecting it with the under side of the shelf 76 to strengthen the construction.

The head frame 16 has a boss 80 projecting into the open space 81 thereof, through which boss is rotatably fitted a plug 82 having an annular flange 83 countersunk in the front face of the head frame and a knurled nut 84 threaded up to a shoulder on its other end to constitute a means for turning the plug 82 in the boss. A tubular stem 85 slidably and rotatably fits through the plug 82 longitudinally thereof and eccentric therewith so that as the plug 82 is rotated in its bearing in the head frame the tubular stem 85 will be raised or lowered with relation to the punching table. In the rear end of the tubular stem 85 is threaded a set screw 86 which bears against a pin 87 extending through the stem, forcing it to press against a gage rail 88 which has a dove tailed rib on its back extending lengthwise thereof and fitting in a correspondingly shaped slot in a head on the end of the stem 85. The gage rail is slidably adjustable on the stem 85 by means of this dove tailed connection when the set screw 86 is loose, but is locked in its

adjustments by the pressure of the pin 87 thereon when the set screw is tightened. The stem 85 may be moved in the plug 82 toward or away from the punching and cutting tools 5 to the desired extent, which may be determined by a series of graduations 89 thereon showing beyond said plug, and then the stem may be bound in this position by tightening a clamping screw 90 which is threaded 10 through the side of the boss 80 and passes through a slot 91 in the plug 82 and bears against the stem 85 so as to bind the stem and plug against movement.

When it is desired to adjust the gage rail 15 88 nearer to or farther from the punching and cutting tools it is only necessary to loosen the clamping screw 90 and slide the tubular stem 85 within the plug 82 to the desired position; and when a vertical adjustment of the gage rail 88 is desired this may 20 be accomplished by turning the plug 82 by means of its knurled nut 84 so as to cause the tubular stem 85 which is eccentric therewith to raise or lower the gage rail and when the 25 desired position of the gage rail is reached the tightening of the clamping screw 90 not only prevents the tubular stem from sliding in the plug 82, but also prevents said plug from turning in its bearing, the tubular 30 stem and the plug being clamped between the bearing for the plug and the clamping screw 90.

In order that the gage rail 88 which limits the position of the material to be punched 35 laterally of the punching and cutting mechanism may be supplemented by a means for limiting the position of the material longitudinally of the row of punching and cutting mechanisms, a gage rod 92 is provided which 40 is of a U-shape with one arm considerably longer than the other and passed through registering openings in the pair of webs 66 of the bracket table. Except when clamped by a set screw 93 threaded in one of said webs 45 and bearing thereon said gage rod 92 is free to slide in these openings so as to bring its shorter end, which extends around the end of the punch table, nearer to or farther from the end cutting tool 56 and thereby form a 50 stop against which the material to be punched may strike to determine the position of said material for the punching and cutting operation, said short arm of the gage rod resting upon the punch strips 75, preferably in alinement with the punching and 55 cutting mechanism.

It is desirable that a means should be provided for assuring the material to be punched being moved all the way up to the guide rail 60 88 before the punching and cutting operation, and to this end there is provided a rocker arm 94 to be operated by the depression of the treadle 25 and which carries a gage finger adapted to move toward the 65 work as the machine is started in operation.

The rocker arm 94, is rigidly mounted on shaft 95 which is journaled through the two webs 66 of the bracket table 59 and is provided near one end with a shouldered member 96 rigidly keyed thereto and which is 70 adapted to engage with a shouldered hub 97 of a crank arm 98 on the shaft, connected by means of a connecting rod 99 to the front portion of the treadle 25. A sleeve 100 which is also rigidly keyed to the shaft 95 75 has a coiled spring 101 fixed to it at one end, the other end of said spring being connected to the crank arm 98, so that the tendency of said spring is to cause the shoulders of the hub 97 and the shouldered member 96 to re- 80 main in engagement, but permitting the crank arm 98 to continue moving to separate the shoulder of its hub from the shoulder of the shouldered member 96 when the rocker arm 94 is stopped in its movement from any 85 cause before the treadle 25 has completed its movement. To adjustably limit the degree of movement of the rocker arm 95 a set screw 102 is threaded through said rocker arm to strike against the front end of the horizontal 90 portion of bracket table 95 and is provided with a jam nut 103 to lock it in its adjustments.

The upper end of the rocker arm 94 forms a socket through which a stem 104 is ad- 95 justably slidable and is bound in its adjustments by means of a set screw 105 threaded through said socket end of the rocker arm. The inner end of the stem 104 carries a pivoted finger 106 which rests upon the shelf 76 100 and when the rocker arm 94 is swung by means of the operation of the treadle 25 said finger 106 is adapted to slide upon the shelf 78 and the punch table strips 75 moving the material toward the gage rail 88 until the 105 rocker arm 94 is stopped by the engagement of the set screw 102 with the bracket table 59. When the treadle 25 is released the crank arm 98 is swung upwardly until the shoulders of the hub 97 and the shouldered member 96 110 are engaged, when the rocker arm 94 is caused to swing therewith to its normal position as shown in Fig. 3.

The punchings which are ejected from the tubular punches 45 become objectionable 115 when no means is provided for removing them and one of the objects of this invention is to automatically clear the punching table of these punchings at all times. This is accomplished by means of a blower secured 120 to the standard or base 15 discharging air through a discharge pipe onto the punching table in the direction of the line of punching and cutting tools.

A bracket 107 is bolted or otherwise se- 125 cured to the standard 15 and has a half section of a blower casing 108 secured to its outer end, the other half section of the blower casing being bolted to the first mentioned half section thereof and carrying a bracket 130

109 forming an extension of the bracket 107. The bracket 107 and its extension bracket 109 are provided with sockets 110 into which fit bosses 111 of pivoted journal bearings 112, the bosses 111 bearing against suitable washers 113 in the sockets 110 and being clamped in position by means of clamping screws 114. By means of the washers 113 the journal bearings 112 may be alined so that they both lie in the same vertical plane and the mounting of the journal bearings in the sockets 110 is such that their pivotal movement enables them to automatically register in perfect alinement when a shaft 115 is journaled therein.

Each end of the shaft 115 is slightly reduced to fit within the journal bearings 112 and at the reduction in its diameter it is provided with an annular groove 116 and an annular flange 117 between the groove and the reduced portion of the shaft, the flange 117 rotating in an internal annular groove 118 in the bore of the journal bearing which groove communicates by means of a passageway 119 with an oil pocket 120 beneath the bearing 112. At the other end of the journal bearing 112 is another passageway 121 leading to the bore of the journal bearing through which a wick 122 passes from the lower end of the oil pocket 120 to a slot 123 of a slotted plug 124 which fits in the bore of the journal bearing and is held against the end of the shaft 115 to take the end thrust thereof by means of a shouldered screw 125 threaded in said bore of the journal bearing. The wick 122 continues from said slot 123 through a smaller bore 126 of the journal bearing extending along the main bore thereof to the annular groove 118 and partially co-inciding with the main bore, so that the wick 122 practically rests upon the reduced portion of the shaft 115. A screw plug 127 is threaded in the lower end of the oil pocket 120 through which the contents of the oil pocket may be drained for cleaning and a perforation 128 near the upper portion of the oil pocket serves as an inlet opening through which oil may be inserted in the oil pocket.

The operation of the lubricating means for the journal bearing 112 above described is that the oil in the pocket 120 is conveyed by means of the wick 122 through the passageway 121 and the slot 123 of plug 124 to the small bore 126 where said wick extends the full length of the bearing portion of the shaft 115 in contact with the shaft and supplying it with oil, the surplus oil in the bearing being thrown by the centrifugal action of the annular flange 117 into the annular groove 118 from which it is returned to the oil pocket by means of the passageway 119.

A suitable blower fan 129 is mounted on the shaft 115 between the journal bearings and within the fan casing 108 and a driving pulley 130 is also mounted on said shaft 115

between the journal bearings 112 but outside of the casing, the bracket 107 being recessed at 131 to accommodate it. A driving belt 132 connects the driving pulley 130 with a large pulley 133 on the countershaft 22 so that the fan wheel 129 will be driven thereby at a high speed. The mouth of the fan casing 108 has connected to it a telescopically adjustable discharge spout 134 which is bent to first extend at right angles to its main portion and then terminate in an inclined flattened discharge nozzle 135 directing the blast of air along the line of punching and cutting tools so as to effectively remove all punchings and scraps left upon the punching table by the cutting and punching tools.

As the description of each of the several parts of the invention has been accompanied by a statement of its operation and function to make clear its construction and relation to the other parts, a further statement of the operation of the machine need be only general. Therefore briefly resuming, the operation of the machine as herein described is as follows. The driving pulley 24 being belted to a suitable source of power and causing the rotation of the countershaft 22 drives the loose pulley 18 on the crank shaft 17 through the belt 20 and the blower fan 129 through the belt 132. The clutch 19 being normally out of connection, the punching apparatus proper remains inactive until the treadle 25 is depressed. Previous to this, however, the proper adjustments are to be made, first, of the punching table 139 with relation to the punching mechanism by a vertical adjustment thereof through set screws 63. Then the bed of wooden strips 75 is to be adjusted horizontally in any direction by loosening the thumb bolts 68 to present a new surface of the wooden strips 75 to the punching and cutting mechanism if the machine has previously been in operation. The gages are to be adjusted by turning the knurled nut 84 when the clamping screw 90 is loose so as to raise or lower the tubular stem 85 and cause the gage rail 88 to rest upon the top of the bed of wooden strips 75 or wherever desired. Its adjustment toward or away from the punching and cutting mechanism is accomplished by sliding the tubular stem 85 through the plug 82 and in its adjusted positions, both vertical and horizontal it is secured against accidental movement by the tightening of the clamping screw 90. The gage finger 106 has its forward movement determined by the position of the set screw 102 so that it will stop at a distance from the gage rail 88 equal to the width of the material to be operated upon, and the gage rod 92 is adjusted in its bearings by loosening the screw 92 and sliding it to the position desired with relation to the end cutting tool 56 and again tightening the screw 93 so that the material when fed along the wooden strips 130

75 until stopped by the gage rod will be in the proper position to receive the punching and cutting operation without a waste of the material. Now, when the material is placed
 5 on the punching bed and the treadle 25 is pressed by the foot of the operator the connecting rod 99 causes the gage finger 106 to slide across the table and press the material to be punched against the gage rail 88 while
 10 simultaneously the connecting rod 29 operates the clutch 19 and causes the pulley 18 to rotate the crank shaft 17 and produce an operation of the punching and cutting mechanism, the block 30 sliding horizontally in
 15 the ram 32 and the ram sliding vertically in its guideways of the head frame. Preferably the clutch 19 is of such a nature that it permits of but a single operation of the punching and cutting mechanism and then
 20 automatically disengages the pulley 18 from the crank shaft 17 until another depression of the treadle 25, so that the material having received its punching and cutting operation may be removed at will having received a
 25 perforation from each tubular punch 45 and a rounded end cut by the semi-cylindrical cutter blade 56, the arrangement of the punching and cutting tools as here shown being that usually employed for cutting and
 30 punching buckle strap ends for harness and the like though other arrangements of these tools for other purposes may be adopted at will. The punchings dropped by the several punches and the waste material left by the
 35 end cutter will be immediately removed by the operation of the blast from the blower which is kept in constant motion for that purpose and therefore the following operations of the machine will not be hindered by
 40 the presence of such punchings or waste material on the punching table.

While a particular embodiment of this invention has been shown and described for the purpose of illustrating this invention it
 45 is not to be understood therefrom that the invention is confined solely to such details of construction and arrangement of parts, but that various changes and alterations and substitutions may be made without departing
 50 from the spirit and scope of this invention.

The object in locating the wick 122 above the shaft 115 is to avoid reducing the bearing surface of the bearing 112 since the belt
 55 132 by which the said shaft is driven pulls downwardly thereon and to place the bore 126 for the wick beneath the shaft 115 would cut away a portion of the bearing surface of the bearing and cause rapid wear.

60 What we claim as our invention is,

1. In combination, a frame, a punching mechanism thereon, a table on the frame, a punch bed adjustably mounted on the table, a flange on one side of the punch bed, clamping
 65 screws mounted on the other side of

the punch bed, and strips of soft material clamped on the punch bed between the clamping screws and the flange thereof for receiving the material to be punched.

2. In combination, a frame, a punching 70 mechanism thereon, a table carried by the frame, a punch bed adjustably mounted on the table, a flange on the punch bed, a clamping screw on the punch bed, a series of strips of soft material clamped to the punch bed 75 between the clamping screw and the flange thereof, and a shelf secured to the flange of the punch bed at approximately the level of the surface of the strips of soft material.

3. In combination, a frame, a table there- 80 on, a punching mechanism on the frame above the table, a punch bed mounted on the table, bolts connecting the punch bed with the table and passing through slots therein at an angle to each other so that the punch bed 85 may be adjustably clamped thereby to the table, and means carried by the punch bed to support the material to be punched without injuring the cutting edges of the punching mechanism. 90

4. In combination, a frame, a punching mechanism thereon, a table on the frame, a punch bed mounted on the table, bolts connecting the punch bed with the table and passing through slots thereof at an angle to 95 each other so that the punch bed may be adjusted and clamped to the table, a flange on the punch bed, a clamp screw on the punch bed, a number of strips of wood clamped to the punch bed between the clamp screw and 100 the flange, and a shelf secured to the flange with its top plate overhanging the said flange and standing approximately in a plane with the top surface of the strips of wood.

5. In combination, a frame, a punching 105 mechanism thereon, a punching table on the frame, a plug rotatably mounted in the frame, a stem carried by the plug eccentric thereto, a gage carried by the stem, and means for holding the plug in its adjusted 110 positions.

6. In combination, a frame, a punching mechanism thereon, a punching table on the frame, a plug rotatably mounted in the frame and having means for turning it, a 115 stem carried by the plug eccentric thereto, a gage rail carried by the stem, and a screw threaded through the frame and adapted to press the plug against its seat to lock the plug in its adjustments. 120

7. In combination, a frame, a punching mechanism thereon, a table carried by the frame, a plug rotatably mounted in the frame, a tubular stem slidable in the plug and eccentric thereto, a gage rail slidable in 125 the tubular stem, a screw threaded in the tubular stem and adapted to bind the gage rail to prevent its sliding on the tubular stem and means for locking the plug and the tubular stem in their adjusted positions.

8. In combination, a frame, a punching mechanism thereon, a table on the frame, a plug rotatably mounted in the frame, a stem slidable in the plug, a gage rail carried by the stem, and a screw threaded in the casing and passing through a slot in the plug and engaging the stem whereby the stem and plug may be clamped in their several adjustments.
9. In combination, a frame, a punching mechanism thereon, a table carried by the frame, a shouldered plug rotatably mounted in the frame, a nut threaded thereon by which the plug may be turned, a tubular stem slidable in the plug and eccentric thereto, a gage rail carried by the tubular stem, a screw threaded in the tubular stem, a pin located in the tubular stem and adapted to be forced by the screw against the gage rail to prevent said gage rail moving on the tubular stem, and a clamping screw threaded through the frame and passing through a slot in the plug to bear upon the tubular stem and so bind the plug and the tubular stem to prevent their moving out of adjustment.
10. In combination, a frame, a punching mechanism thereon, a bracket table carried by the frame, webs on the bracket table, a U-shaped gage rod having a long arm slidable in openings through the webs and extending around the end of the bracket table with its shorter arm resting upon the bracket table and adapted to be moved toward or away from the path of the punching mechanism by sliding the longer arm through the openings in the webs, and a set screw threaded in one of the webs to lock the gage rod in its adjustments.
11. In combination, a frame, a punching mechanism thereon, an adjustable bracket table carried by the frame, a shaft journaled in the bracket table, a rocker arm mounted on the shaft, a gage finger pivotally mounted on the rocker arm and resting on the bracket table, and means for oscillating the shaft to cause the rocker arm to swing and bring the gage finger against the material to be punched.
12. In combination, a frame, a punching mechanism thereon, a table carried by the frame, a shaft journaled in the table, a rocker arm carried by the shaft, a stem adjustable on the rocker arm, a gage finger pivoted to the stem and adapted to rest on the table, and adjustable means for limiting the movement of the rocker arm, a shouldered fixed member on the shaft, a shouldered loose member on the shaft, a spring having one end fixed to the shaft and pressing against the loose member to cause said member to press its shoulder against the shoulder of the shouldered fixed member, an arm on the loose member, a treadle for producing the operation of the punching mechanism, and a connecting rod connecting the arm with the treadle.
13. In combination, a frame, a punching mechanism thereon, a bracket table on the frame having a pair of webs, a shaft journaled between the webs, a rocker arm on the shaft, a stem adjustable on the rocker arm, a gage finger pivoted to the stem and bearing on the table, a set screw threaded through the rocker arm and adapted to engage the table to limit the movement of the rocker arm, a jam nut on the set screw to lock the set screw in its adjustments, a shouldered fixed member on the shaft, a shouldered loose member on the shaft, a fixed sleeve on the shaft, a coil spring having one end secured to the fixed sleeve and the other end bearing against the loose member and adapted to hold the shoulder of the loose member against the shoulder of the fixed member, a crank arm on the loose member, a treadle for producing the operation of the punching mechanism, and a connecting rod connecting the crank arm with the treadle.
14. In combination, a tool block, a boss formed thereon and connected therewith on one side but disconnected therefrom on the other side, said boss being split and having a threaded bore, a punch threaded in the bore of the boss, and a clamp for clamping the boss against the punch.
15. In combination, a punch block, a split boss formed thereon and partially separated from the punch block by a slot between the boss and the punch block, a punch threaded in the boss, and a clamp ring surrounding the boss and adapted to clamp the boss against the punch.
16. In combination, a punch block, a split boss formed thereon, and partially separated from the punch block by means of a slit between the boss and the punch block, a tubular punch threaded in the boss, a discharge outlet passageway in the punch block for the punchings communicating with the bore of the tubular punch, a clamping ring surrounding the boss, and a screw threaded through the clamping ring and bearing on the boss adapted to clamp the boss against the tubular punch.
17. In combination, a punch block, a split boss formed thereon, and partially separated therefrom by means of a slit between the boss and the punch block, the split of the boss being located at one end of the slit, a tubular punch threaded in the boss, an inclined passageway through the punch block registering with the bore of the tubular punch, a clamping ring surrounding the boss, and a screw threaded through the clamping ring and bearing on the boss opposite the slit thereof and adapted to clamp the boss around the tubular punch.
18. In combination, a punch block, a split boss formed thereon partially separated therefrom by a slit between the boss and the punch block, a punch threaded in the boss, a

clamping ring surrounding the boss, a screw threaded therethrough and adapted to clamp the boss on the punch, and a coiled spring stripper secured to the clamping ring and surrounding the punch.

19. In combination, a punch block, a split boss thereon partially separated therefrom by a slit between the boss and the punch block, a punch threaded in the boss, a clamping ring surrounding the boss, a screw threaded therethrough and adapted to clamp the boss around the punch, a second screw threaded in the clamping ring, and a coiled spring stripper secured to the clamping ring thereby.

20. In combination, a tool block, a threaded boss thereon, a nut threaded on the boss, a cutting tool having a cylindrical base fitting the boss, a disk having a shouldered seat in said cylindrical base, and a screw passed through the disk and threading into the boss.

21. In combination, a tool block, a threaded boss thereon, a nut threaded on the boss, a semi-cylindrical cutting tool having a cylindrical base fitting on the boss and bearing on the nut, a disk having an annular shouldered seat in said cylindrical base, and a screw passed through the disk and threaded into the boss whereby the cutting tool may be clamped in adjusted positions on the tool block.

22. In combination, a punching mechanism having a suitable supporting frame, a

35 bracket on said frame, a fan casing mounted on the bracket, an extension bracket on the fan casing, journal bearings mounted on the bracket and the extension bracket, a fan shaft journaled in said journal bearings, means for driving the fan shaft, and means 40 for conducting the air from said casing, to the punching mechanism.

23. In combination, a punching mechanism mounted on a supporting frame, a pair of pivotally mounted journal bearings having 45 support from the frame, a blower fan journaled in said bearings, and a casing surrounding the blower fan and adapted to discharge the air at the punching mechanism.

24. In combination, a punching mechanism 50 provided with a suitable supporting frame, a pair of journal bearings having pivotal support from the frame by means of bosses thereon pivotally mounted in sockets in members secured to the frame and having 55 adjusting screws clamping them in said sockets, a blower fan journaled in the journal bearings, and a casing surrounding the blower fan and adapted to discharge air at the punching mechanism. 60

In testimony whereof, we affix our signatures, in presence of two witnesses.

CHARLES GORDON.
HARRY HART.

Witnesses:

R. S. C. CALDWELL,
ANNA F. SCHMIDTBAUER.