

Sept. 20, 1949.

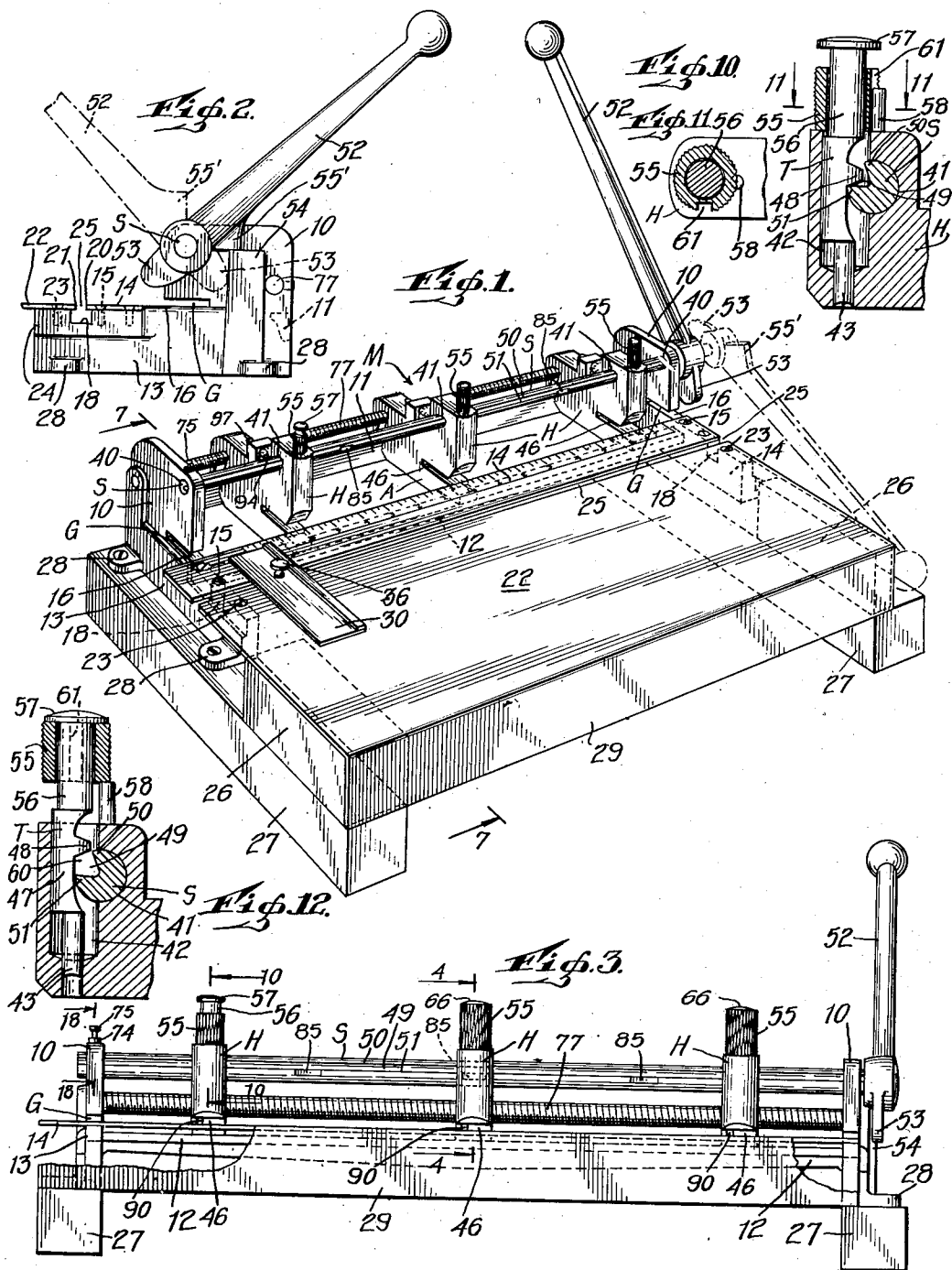
S. SEGAL

2,482,218

PAPER PERFORATING DEVICE

Filed Feb. 26, 1945

2 Sheets-Sheet 1



INVENTOR
SAMUEL SEGAL
BY
Samuel Segal
ATTORNEY

Sept. 20, 1949.

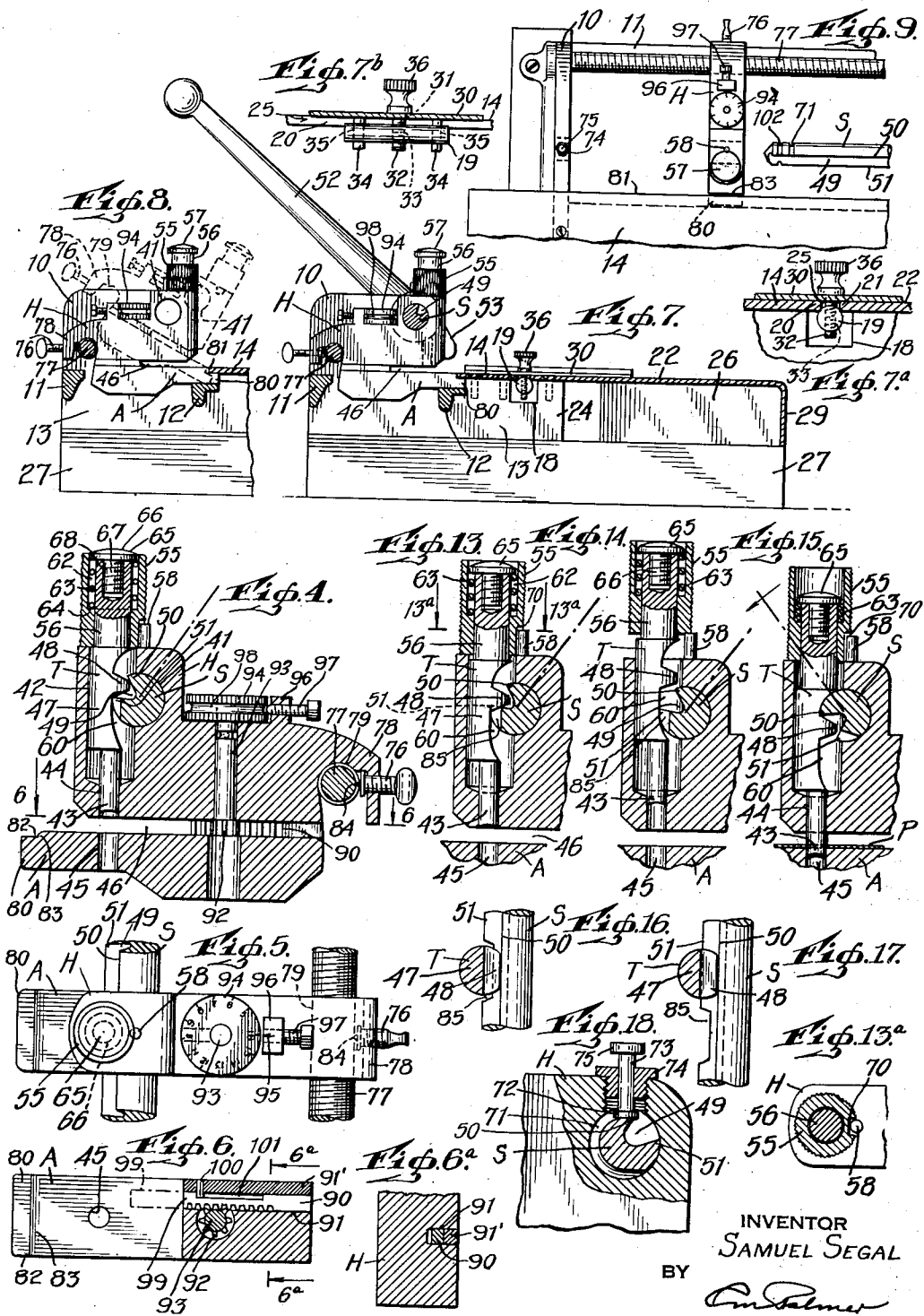
S. SEGAL

2,482,218

PAPER PERFORATING DEVICE

Filed Feb. 26, 1945

2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,482,218

PAPER PERFORATING DEVICE

Samuel Segal, New York, N. Y., assignor to Wilson-Jones Co., Chicago, Ill., a corporation of Massachusetts

Application February 26, 1945, Serial No. 579,764

50 Claims. (Cl. 164—91)

1

This invention has to do with punching and is particularly directed to perforating a stack of paper, cardboard, leather and/or the like and more specifically is concerned with a conveniently controlled and serviceable perforating machine having means selectively adaptable for severally and/or jointly actuating a plurality of slidably guided punching tools for readily penetrating the stack of sheet material. One important object of the invention resides in the provision of novel means for coupling or uncoupling the cutting tools to render them severally or jointly effective or ineffective with common driving means therefor. Another object of the invention is concerned with the utilization of a plurality of tool sustaining standards or headers conveniently and selectively adjustable longitudinally of the machine for desirably controlling the spacing of the cutting or punching tools. Specifically the invention has as another object to provide serviceable and regulatory means for controlling the extent of insertion of a stack of material into the headers prior to perforating. More particularly the invention has as a further object the utilization of a novel stop slidably guided longitudinally of the machine for controlling predetermined setting of the stack relative to the cutting tools of the headers prior to insertion of the stack in the headers. As a further object the invention is concerned with slidably guided tool carrying headers which may be quickly attached to the perforating machine and which if desired may be readily disengaged therefrom. Still a further object of the invention deals with novel shaft means adapted to be threaded into the several headers to removably interlock with the cutting tools thereof and adapted to be rotatably driven by a lever appropriately accessible at one side of the machine. Further functional and structural features of the invention reside, inter alia, in the provision of means for quickly arranging the operating lever in a lowered and out of the way position for purposes of compactly transporting the machine; the provision of means to permit withdrawal of the driven shaft means from the headers preparatory to the removal of the headers jointly and/or severally from the machine, the provision of rotatable indicia carrying means for actuating reciprocable means to limit the admission of the stack of material into the headers. Other functional, structural and salient features, advantages, and objects of the invention will appear from the teachings of the following detailed description considered in connection with the accompanying drawings wherein:

Fig. 1 is a perspective view of the perforating machine according to my invention, illustrating in full lines the operating handle in its normal raised or retracted position and in dash and dot lines in a lower and out of the way position essen-

2

tial for purposes of compactness in packing for transportation.

Fig. 2 is a fragmentary side view of Fig. 1, illustrating in full lines the handle fully retracted and in dash and dot lines at the completion of its downward operating stroke.

Fig. 3 is a front elevational view of Fig. 1, shown partly broken away to illustrate the intermediate and longitudinally disposed brace or shelf.

Fig. 4 is a transverse sectional view of one of the slidably guided and removable headers taken on the line 4—4 of Fig. 3.

Fig. 5 is a plan view of Fig. 4.

Fig. 6 is a horizontal sectional view on the line 6—6 of Fig. 4.

Fig. 7 is a transverse sectional view on the line 7—7 of Fig. 1.

Fig. 7^a is an enlarged detailed view of Fig. 7.

Fig. 7^b is a fragmentary detailed view of Fig. 1, illustrating clamping means for the slidable guided stop.

Fig. 8 is a fragmentary view of Fig. 7, however depicting one of the removable headers in full lines and showing in dash and dot lines the manner of positioning or removal thereof on or from the machine when desired.

Fig. 9 is a plan view of a fragmentary portion of the machine, showing the tool operating shaft disassociated from one of the headers.

Fig. 10 is a transverse sectional view on the line 10—10 of Fig. 3, showing the operating shaft coupled to the slidable punching tool.

Fig. 11 is a horizontal sectional view on the line 11—11 of Fig. 10.

Fig. 12 is a view similar to Fig. 10 but illustrating the operating shaft uncoupled from the punching tool and the latter in an elevated and idle position.

Fig. 13 is a fragmentary view of Fig. 4 but with the cutting tool of the header interlocked with an index notch portion of the operating shaft for predetermined setting.

Fig. 13^a is a sectional view on the line 13^a—13^a of Fig. 13.

Fig. 14 is a view similar to Fig. 13 but with the cutting or punching tool elevated and uncoupled from the operating shaft.

Fig. 15 is a view similar to Fig. 13 illustrating cutting tool driven through the perforated anvil by the shaft for cutting through the stack.

Fig. 16 is a fragmentary view illustrating one of the cutting tools removably interlocked with one of the indexing notches on the drive shaft.

Fig. 17 is a view similar to Fig. 16 however depicting the cutting tool out of the index notch and unlocked for purposes of displacement of its header along the shaft, and

Fig. 18 is an enlarged sectional view on the line 18—18 of Fig. 3, illustrating the locking means to prevent longitudinal displacement of the shaft.

3

Fig. 6^a is a sectional view on the line 6^a—6^a of Fig. 6.

In the embodiment disclosed, the perforating machine is generally designated M and is characterized by a one piece and sturdy cast iron frame having spaced side or standards 10 integrally merged with a rear strengthening brace 11 and with the front strengthening brace 12 also integral with the standards 10.

Also integral with the transversely arranged standards 10 of the frame are the forwardly projecting ledges 13 on which the graduated panel 14 is secured by the screws 15. This panel has its top face substantially flush with the aligned lower walls 16 or the stack receiving gaps G of the end brackets 10.

Interrupting the forwardly extending ledges 13 are the aligned slots 18 in which rod 19 (Figs. 7, 7^a and 7^b) is slidably and guided longitudinally by the spaced but adjacent margins 20 and 21 of the rear graduated panel 14 and the front panel 22, the latter being secured by the adjustable and removable screws 23 (Fig. 1) fastened to the forwardly disposed portions 24 of the ledges 13. Thus arranged the front and rear panels are separated by a gap 25 disposed lengthwise of the platform for supporting a stack of paper, cardboard and/or leather adapted to be perforated.

Referring again to the forward panel 22, the latter is also desirably supported by the front corner blocks 26 which in turn are fixedly mounted on the cross bars 27 to which the spaced ears 28 of the spaced standards 10 are appropriately fastened and the downwardly turned front wall 29 of the front panel 22 is disposed adjacent the front ends of the spaced blocks 26.

Associated with the slidably and longitudinally guided rod 19 is the stop or clamping plate 30 having a perforation 31 through which the threaded shank or stem 32 extends, the stem being threadably interconnected with the guide rod 29 by the threaded bore 33. Attached to and depending from the stop or gage 30 are the spaced posts 34 extending through correspondingly shaped openings 35 in the rod 19. Thus by rotating head 36 of stem 32, rod 19 may be shifted towards or away from the margins 20 and 21 of the rear and front panels 14 and 22, to be clamped thereagainst or be unclamped therefrom. If unclamped, margins 20 and 21 characterize rails for slidably guiding the displacement of the rod 19 and by the arrangement disclosed, the stop or gage 30 in its clamped relation against the panels is substantially normal to the dividing gap 25 as illustrated.

According to the invention a plurality of tool carrying headers generally denoted H is desirably interposed between the spaced standards 10. Specifically each of the headers H is slidably and removably mounted on the rotatable shaft S journaled in the openings or bearings 40 in the standards 10 and in the openings 41 in the several headers H each of which embodies a vertical bore 42 normal to and in communication with its bearing or opening 41.

The perforating or punching tools generally denoted T are slidably guided in the vertical bores 42 and each include a punching stem 43 slidably guided in a vertical bore 44 in alignment with bore 45 in the anvil A of its respective header, the anvil defining with its header, a suitable gap or throat 46 to permit the insertion of a stack of paper, cardboard, leather and/or the like therein.

Each punching tool T is provided with an in-

4

termediately arranged reduced portion 47 from which laterally extends a tooth 48 normally disposed in an outwardly diverged gap or groove 49 running lengthwise of the operating or driven shaft S. By this arrangement upper and lower lips 50 and 51 are provided on the operating shaft S and these in fact movably interlock with the teeth 48 of the cutting tools T. To the rotatable shaft S is desirably fastened the operating handle 52 which includes a lug 53 for cooperating with a boss 54 extending from a standard 10 to limit the downward rotational stroke of the handle (Fig. 2) at which time the punching stems 43 of the tools as T (Fig. 15) have punched or perforated the sheet material P which may be paper, cardboard, leather, etc. At this time, a punching stem 43 is slidably disposed in an aligned paper exhaust bore 45 of its anvil A and is awaiting the return stroke of the handle and such return stroke is limited by the lug 55' striking the top face of the boss 54 (Fig. 2).

Where the shaft S is coupled or interlocked with the teeth 48 of the slidably or reciprocably guided tools T, rotational displacement of the handle will slidably but vertically displace these tools. Where only one or perhaps possibly two cutting tools are sufficient in actual practice, the remaining tools not needed may be readily uncoupled from the shaft. For this purpose, it will be noted that with each cutting tool is provided a lifting knurled member 55 in the form of a sleeve rotatably and slidably surrounding a cylindrical extension 56 projecting from each cutting tool T and beyond its respective header.

In the form illustrated in Figs. 10 and 12 the lifting sleeve 55 cooperates with the overhanging rim of the head 57 to elevate the cutting tool T from the coupled relation thereof (Fig. 10) to its uncoupled relation with the tooth 48 (Fig. 12). The uncoupling relation is maintained by manually rotating the lifting sleeve 55 after having been manually elevated to position its lower face onto the top face of a post 58 (Fig. 12) fixedly fastened to an associated header H. Thus if the lever or handle be operated in either direction and if the cutting tool is uncoupled therefrom, the cutting tool will not be displaced, in that shaft S rotates idly (Figs. 12 and 14) insofar as it relates to the uncoupled cutting tool.

Where it is desired to couple a cutting tool T to the shaft, sleeve 55 is rotated until its slot 61 (Fig. 12) receives the post 58 at which time the sleeve is dropped, thus the cutting tool is freed and falls by its own weight provided the lever 52 is in its fully rearward position to permit tooth 48 to by pass the upper lip 50 and engage the lower lip 51. By this action, the tooth 48 is again interposed in the slot 49 of the shaft S. In effect it may be said that the key and slot connection defined by post 58 and groove 61 permits the knurled sleeve 55 to be reciprocably and slidably guided relative to the fixed post 58 and thus relative to its header.

In Fig. 1, three slidably guided and removable headers H are illustrated, the tool lifting means at the left hand end is along the lines of Figs. 10 and 12 while the remaining two headers have the tool lifting means illustrated in Figs. 4, and 13 to 15 inclusive and in the latter it will be observed that the rotatable and slidable sleeves 55 are each provided with an upper attenuated rim defining with extension 56 an annular chamber 62 wherein a normally expandible helicoidal spring 63 is confined between the annular shoulder 64 (Fig. 4) and the overhanging rim of the

head 65 of the set screw 66 having its shank 67 removably and threadably connected to the threaded bore 68 of the extension 56 of the cutting or punching tool T, the arrangement being such that if one or more of the cutting tools be coupled to the shaft S, and thereafter the handle be depressed or retracted the extensions 56 are not only displaced relative to the knurled sleeves 55 but in addition heads 65 slide in the chambers 62 and on the cutting stroke of the tools, spring 63 is compressed by the rim of head 65 (Fig. 15) and upon the return stroke of the operating handle the lips 51 drive the lower inclined faces of the teeth 48 to engage and elevate the cutting tools and the formerly compressed spring 63 expands and facilitates on the return stroke of the oscillatable shaft S, the withdrawal of the punching stems 43 from the stack P which may be as previously stated of paper, cardboard, leather and/or the like.

To selectively uncouple the cutting tools T of Figs. 4, and 13-15 the handle is first retracted fully, for example, as indicated by the dash and dot lines in Figs. 4 and 14. Thereafter a sleeve 55 is raised against the resistance of its associated spring 63 and positioned on the top face of the adjacent fixed post 58 (Fig. 14), thus uncoupling the cutting tool. Therefore even though the shaft may be rotated, the uncoupled cutting tool remains in raised but idle position. To again couple the cutting tools of Figs. 13-15 to the oscillatable shaft S, a respective sleeve 55 is rotated until its slot or keyway 70 lines up to receive an associated pin 58 and thereafter finger pressure is released. Spring 63 then expands and automatically retracts its sleeve which now yielding rests on the top face of its header (Figs. 4 and 7).

With the teeth 48 of the cutting tools interlocked with the shaft, that is, coupled thereto, on the downward or operating stroke of the handle, the upper lip 50 of the oscillatable shaft S coacts with and engages the upper inclined face of these teeth to depress the punching or cutting tools so that the punching stems 43 are downwardly displaced and through the stack of papers, cardboard, leather and/or the like inserted into the aligned gaps 46 of the several headers, and of course on the return stroke lips 51 act on these teeth to elevate or return cutting tools.

To preclude lateral displacement of the shaft S, the latter includes a groove 71 (Figs. 7 and 18) for removably receiving and interlocking with the enlarged end 72 of the movable pin 73 slidably guided in the exteriorly threaded bushing 74 (Fig. 18) mounted on the left hand brace 10 (Fig. 9) of the frame of the machine. By grasping head 75, pin 73 may be slidably withdrawn from the groove 71, thus unlocking the shaft S. Hence the latter may be slidably withdrawn from the headers, for example, in Fig. 9, shaft S is shown moved laterally to the right and disengaged from one header but if desired the shaft can be withdrawn from all of the headers and later rethreaded therein.

Where a header H is disassociated from shaft S, it may be readily replaced by another header or removed from the machine. If it is desired to remove a header, its rearwardly extending threaded set screw 76 is first disengaged from a threaded or notched supporting rod or reinforcing member 77 interconnecting the spaced braces 10 and thereafter the rear portion of the header is tilted upwardly (note dash and dot lines Fig. 8), that is, the tail portion 78 embodying the

notch 79 may be lifted to be free of the sustaining rod 77, and consequently the forwardly extending lip 80 of the anvil is correspondingly tilted and may be slidably withdrawn from between the rear margin 81 and the shelf or brace 12 which in fact characterizes a support for the anvils which upon the positioning of a header back onto the machine, may be readily placed on the shelf 12 to permit the reception of the rear margin 81 of the rear panel 14 in a re-entrant recess 82 of the anvil and against the stop shoulder 83. Thereafter the tail portion 78 is swung downwardly for reception of the fixed rod 77 in the notch 79. Thus each header is also removably sustained by the shelf or brace 12 and the rear rod 77 and if it is desired to set a header in a fixed position the threaded set screw 76 is tightened until its pointed end 84 (Figs. 4 and 5) is interlocked with the walls of a groove in the supporting rod 77.

According to the invention the headers may be set in predetermined positions along the shaft S and this is accomplished in first disconnecting the threaded set screws 76 from the rear supporting rod 77, and thereafter slidably shifting one or more of the several headers until the sides of attenuated portions 47 of the cutting tools T ride into a gap or notch 85 along the shaft S and many notches or keeper means as 85 may be provided as desired for predetermined spacing or indexing of the headers. In Fig. 17, the cutting tool T has its reduced or attenuated portion 47 out of notch 85 and by sliding the header along shaft S, the reduced portion 47 snaps into the positioning means or notch 85 (Fig. 16), thus automatically interlocking with the walls thereof. Because of this action, any two headers along the shaft may be conveniently and quickly shifted for predetermined spacing of their cutting tools although each header may be quickly shifted from its selected position by lifting its tool upwardly to remove the reduced portion 47 from the notch 85 and thereafter sliding the header lengthwise of the shaft.

Further in accordance with the invention the extent to which the stack of material or a sheet thereof may be inserted into the aligned gaps 46 in the headers may be controlled and regulated. To this end it will be observed that associated with each header is toothed rack 90 (Figs. 4-6) adapted to be projected into an associated gap 46. Each rack 90 is slidably guided in a slot 91 and meshes with a pinion 92 fastened to a stub shaft 93 desirably journaled in a header and fixedly fastened to each shaft 93 is a manipulatable and readily accessible wheel or graduated disc 94 having suitable indicia thereon. It follows that by rotating the indicia wheel 94 its associated rack 90 may be projected in and out of the adjacent gap 46 (note dash and dot lines Fig. 6). By regulating the indicia carrying wheels relative the datum line or index 95 inscribed on associated bosses 96, predetermined projection of the several racks may be controlled and such settings are maintained by the clamping of the threaded members 97, which selectively are adapted to be removably projected in the annular races or grooves 98, against the wall of such races. If therefore the racks have been adjusted for predetermined projection into the gap 46, the extent of insertion of the stack of material into the gaps 46 is limited in that the forward ends 99 (Fig. 6) of the racks serve as stop means and are desirably lined up in accordance with the setting of the indicator wheels 94. While each rack 90 is

slidably guided, each is limited in its displacement by a fixed pin or key 100 extending from the fixed guide block 91' and fitting into a companion keyway or guide slot 101 in the rack.

In operation, the stack of material to be perforated, which may be paper, is first positioned on the platform defined by panels 14 and 22 and against the stop 30 which previously has been adjusted and clamped. The sheet of paper P is inserted into the aligned gaps or throats 46 of the anvils A of the headers H. With the selected punches or cutting tools T coupled to shaft S, handle 52 is rotated downwardly. By this action, the coupled tools T perforate the stack as desired and thereafter the handle is retracted to its normal raised position. The depth of all slots 46 is the same and of course such depth may be shortened or enlarged upon adjustment of the racks 90 by the regulator wheels 94.

If desired locking pin 73 may be raised out of the end groove 71 (Figs. 9 and 18) and the drive shaft thereafter may be bodily longitudinally displaced and outwardly whereby lug or projection 53 of the pivoted handle 52 clears the boss 54. It follows that the handle 52 may be lowered and positioned on an adjacent block 27 (Fig. 1) and thus takes up less room for packing and transportation purposes. In such out of the way position, the slidable locking pin 73 may be again lowered and dropped into notch 102 (Fig. 9) hence again interlocking with shaft S, thus preventing unnecessary withdrawal of the shaft in its lowered and out of the way position of the handle.

With the locking means 75 clear of either of the grooves 71 and 102, shaft S may be completed slidably and rectilinearly withdrawn from the headers and the punching tools thereof readily removed or replaced. Or the headers may be now removed from the machine and new headers substituted without dismantling or removing the reinforcing rod 77 from the frame. Thereafter shaft S may again be threaded into the headers and interlocked or in mesh with the punching tools which selectively may be lifted or uncoupled to be out of mesh with shaft S if desired.

Various changes may be made in the details of construction and arrangement of parts without departing from the spirit of the invention or sacrificing any of the advantages thereof inherent therein.

I claim:

1. In a perforating machine, a frame having bearing means, a platform supported by said frame, a plurality of headers, shaft means rotatably sustained by said bearing means, punch means slidably guided by said headers, means to interlock said shaft means with said punch means for actuating the latter upon rotation of said shaft means, means for severally shifting each of said punch means selectively out of interlocking relation with said shaft means, and manipulatable means for driving said shaft means.

2. In a perforating machine, a frame having bearing means, a platform supported by said frame, a plurality of headers, shaft means rotatably sustained by said bearing means, punch means slidably guided by said headers, means to interlock said shaft means with said punch means for actuating the latter upon rotation of said shaft means, slidable means for selectively shifting each of said punch means selectively out of interlocking relation with said shaft means, means to sustain said punch means out of said

interlocking relation, and manipulatable means for driving said shaft means.

3. In a perforating machine, a frame having bearing means, a platform supported by said frame, a header, shaft means rotatably sustained by said bearing means and including a longitudinally disposed groove, punch means slidably guided by said header, a tooth extending from said punch means into said groove to interlock said shaft means with said punch means for actuating the latter upon rotation of said shaft means, means mounted on said punch means for shifting the latter out of interlocking relation with said shaft means, and manipulatable means for driving said shaft means.

4. In a perforating machine, a frame having bearing means, a platform supported by said frame, a plurality of headers, shaft means rotatably sustained by said bearing means, punch means slidably guided by said headers, means to couple said shaft means with said punch means for actuating the latter upon rotation of said shaft means, means for severally uncoupling said punch means of said plurality from said shaft means, means to sustain said punch means uncoupled from said shaft means, and manipulatable means for driving said shaft means in the coupled or uncoupled relation thereof with said punch means.

5. In a perforating machine, a frame having bearing means, a platform supported by said frame, a plurality of headers, shaft means rotatably, slidably and removably sustained by said bearing means, punch means slidably guided by said headers, means to couple said shaft means with said punch means for actuating the latter upon rotation of said shaft means, means for severally uncoupling said punch means of said plurality from said shaft means, means to sustain said punch means uncoupled from said shaft means, manipulatable means for driving said shaft means in the coupled or uncoupled relation thereof with said punch means, and locking means to permit or prevent withdrawal of said shaft means from said bearing means.

6. In a perforating machine, a frame having bearing means, a platform supported by said frame, shaft means rotatably and slidably sustained by said bearing means, a plurality of headers slidably and removably mounted on said shaft means, punch means slidably guided by said headers, means to couple said shaft means with said punch means for actuating the latter upon rotation of said shaft means, means for severally uncoupling said punch means of said plurality from said shaft means, means to sustain said punch means uncoupled from said shaft means, manipulatable means for driving said shaft means in the coupled or uncoupled relation thereof with said punch means, and removable locking means for predetermined setting of said headers longitudinally of said shaft means.

7. In a perforating machine, a frame having bearing means, a platform supported by said frame, shaft means rotatably and slidably sustained by said bearing means, a plurality of headers slidably and removably mounted on said shaft means, punch means slidably guided by said headers, means to couple said shaft means with said punch means for actuating the latter upon rotation of said shaft means, means for severally uncoupling said punch means of said plurality from said shaft means, means to sustain said punch means uncoupled from said shaft means, and manipulatable means for driving said shaft

9

means in the coupled or uncoupled relation thereof with said punch means, said shaft having keeper means for interlocking with said punch means upon displacement of said headers longitudinally of said shaft means.

8. In a perforating machine, a frame having bearing means; a platform supported by said frame, shaft means rotatably and slidably sustained by said bearing means; a plurality of headers slidably and removably mounted on said shaft means, punch means slidably guided by said headers, means to couple said shaft means with said punch means for actuating the latter upon rotation of said shaft means, means for severally uncoupling said punch means of said plurality from said shaft means, means to sustain said punch means uncoupled from said shaft means, and manipulatable means for driving said shaft means in the coupled or uncoupled relation thereof with said punch means, said shaft having spaced notches, and said punch means having attenuated portions for slidably interlocking with the walls of said notches upon slidable displacement of said headers relative to said shaft means.

9. In a perforating machine, a frame having bearing means, a platform supported by said frame, shaft means rotatably and slidably sustained by said bearing means and including spaced upper and lower lips defining with said shaft means a groove, a plurality of headers slidably and removably mounted on said shaft means, punch means slidably guided in said headers substantially normal to said platform and having toothed means slidably guided in said groove and removably interposed between said lips, means for holding said toothed means out of said groove and clear of said lips, and manipulatable means for driving said shaft means.

10. In a perforating machine, a frame having bearing means; a platform supported by said frame, shaft means rotatably and slidably sustained by said bearing means and including spaced upper and lower lips defining with said shaft means a groove, a plurality of headers slidably and removably mounted on said shaft means, punch means slidably guided in said headers substantially normal to said platform and having toothed means slidably guided in said groove and removably interposed between said lips, means for holding said toothed means out of said groove and clear of said lips, manipulatable means for driving said shaft means, a reinforcing member carried by said frame and spaced from said shaft means, and adjustable locking means mounted on said headers and cooperating with said member to preclude displacement of said headers relative to said shaft means.

11. In a perforating machine, a frame having bearing means; a platform supported by said frame, shaft means rotatably and slidably sustained by said bearing means and including spaced upper and lower lips defining with said shaft means a groove, a plurality of headers slidably and removably mounted on said shaft means and having a notched portion, punch means slidably guided in said headers substantially normal to said platform and having toothed means slidably guided in said groove and removably interposed between said lips, means for holding said toothed means out of said groove and clear of said lips, manipulatable means for driving said shaft means, a reinforcing member carried by said frame and disposed to the rear of and spaced from said shaft means and removably sustaining said notched portions, and adjustable locking means

10

mounted on said headers and removably engageable with said member to preclude displacement of said headers relative to said shaft means.

12. In a perforating machine, a frame having bearing means, a platform supported by said frame, shaft means rotatably and slidably sustained by said bearing means and including spaced upper and lower lips defining with said shaft means a groove, a reinforcing member spaced from said shaft means and carried by said frame, a header slidably and removably mounted on said shaft means and including a tail portion having a notch for removably receiving said member whereby said tail portion is liftably sustained by said member, punch means slidably guided in said header substantially normal to said platform and having toothed means slidably guided in said groove and removably interposed between said lips, movable means retained on said punch means for lifting said toothed means out of said groove and clear of said lips, and manipulatable means for driving said shaft means.

13. In a machine for perforating sheet material, a frame having bearing means, a platform supported by said frame, shaft means rotatably and slidably sustained by said bearing means and including spaced upper and lower lips defining with said shaft means a longitudinally arranged groove, a plurality of headers slidably and removably mounted on said shaft means and each embodying a sheet receiving throat and an anvil, punch means slidably guided in said headers substantially normal to said anvils and having toothed means slidably guided in said groove and removably interposed between said lips, means for lifting said toothed means out of said groove and clear of said lips, and manipulatable means for driving said shaft means.

14. In a machine for perforating sheet material, a frame having bearing means, a platform supported by said frame, shaft means rotatably and slidably sustained by said bearing means and including spaced upper and lower lips defining with said shaft means a longitudinally arranged groove, a plurality of headers each having a horizontally disposed bore arranged widthwise thereof for rotatably and slidably guiding said shaft means and each having a vertically arranged bore in communication with its respective horizontal bore, punch means slidably guided in said vertically arranged bores and each having toothed means removably arranged in said groove and adapted to be actuated by said upper or lower lips, a handle secured to said shaft means for rotating the latter, and selective means movably retained on said punch means for severally elevating the latter and consequently respective toothed means to arrange the latter clear of and above said lips to preclude actuation of said elevated punch means by said shaft means.

15. In a machine for perforating sheet material, a frame having bearing means, a platform supported by said frame, shaft means rotatably and slidably sustained by said bearing means and including spaced upper and lower lips defining with said shaft means a longitudinally arranged groove, a plurality of headers slidably and removably threaded on said shaft means and each embodying a sheet receiving throat and an anvil, punch means slidably guided in said headers substantially normal to said anvils and having toothed means slidably guided in said groove and removably interposed between said lips, means for lifting said toothed means out of said groove and

clear of said lips, manipulatable means for driving said shaft means, and locking means to prevent or permit withdrawal of said shaft means from said headers.

16. In a machine for perforating sheet material, a frame having bearing means, a platform supported by said frame, shaft means rotatably and slidably sustained by said bearing means and including spaced upper and lower lips defining with said shaft means a longitudinally arranged groove, a header slidably and removably mounted on said shaft means and embodying a sheet receiving throat and an anvil in alinement with said platform, punch means slidably guided in said header substantially normal to said anvil and having toothed means slidably guided in said groove and removably interposed between said lips, means rotatably and slidably mounted on said punch means for lifting said toothed means out of said groove and clear of said lips, and manipulatable means for driving said shaft means.

17. In a machine for perforating sheet material, a frame having bearing means and embodying a boss, a platform sustained by said frame, shaft means rotatably and slidably sustained by said bearing means and including spaced upper and lower lips defining with said shaft means a longitudinally arranged groove, a header slidably and removably mounted on said shaft means and embodying a sheet receiving throat and an anvil in removable alinement with said platform, punch means slidably guided in said header substantially normal to said anvil and having toothed means slidably guided in said groove and removably interposed between said lips, manipulatable means for actuating said shaft means and having projecting means limited in its arcuate displacement transversely of said frame by said boss, said shaft means and frame comprising disengageable locking means to permit or prevent rectilinear and lateral displacement of said shaft means relative to said bearing means, and said locking means when rendered ineffective from said shaft means permitting rectilinear and outward displacement of said shaft means whereby said projecting means is free of said boss.

18. In combination, a frame, a platform sustained by said frame and having spaced panels defining a gap, a rod projectible in part within said gap and slidably guided by said panels, a gage slidable longitudinally of said platform, and means at least in part disposed in said gap and slidably guided by panels and adjustably connected to said rod for removably clamping said gage against said platform.

19. In combination, a rotatable shaft having upper and lower lips, a slidably guided punch having a tooth in mesh and severally engageable with said lips and removably interposed therebetween, liftable means slidably and rotatably surrounding said punch and adapted to raise the latter bodily and elevate said tooth to be clear of and out of mesh with said lips, and means to sustain said liftable means elevated for continuing to hold said tooth out of mesh with said lips.

20. In a perforating machine, a frame having bearing means, a platform supported by said frame, a plurality of headers, shaft means rotatably sustained by said bearing means and having positioning means, punch means in part removably receivable in said positioning means and slidably guided by said headers, means to interlock said shaft means with said punch means

for actuating the latter upon rotation of said shaft means, slidable means mounted on said punch means for severally shifting said punch means selectively out of interlocking relation with said shaft means, and manipulatable means for driving said shaft means.

21. In a perforating machine, a frame having bearing means, a platform supported by said frame, a plurality of headers, shaft means rotatably and removably sustained by said bearing means and having spaced positioning means, punch means slidably guided by said headers and removably receivable by said positioning means to prevent displacement of said headers longitudinally of said shaft means, means to interlock said shaft means with said punch means for actuating the latter upon rotation of said shaft means, means mounted on said punch means for severally and selectively shifting said punch means out of interlocking relation with said shaft means, and manipulatable means for driving said shaft means.

22. In a perforating machine, a frame having bearing means, a platform supported by said frame, a plurality of headers, shaft means rotatably sustained by said bearing means and having spaced positioning means, punch means slidably guided by said headers and having means removably receivable by said positioning means, means to interlock said shaft means with said punch means for displacing the latter relative to said headers upon rotation of said shaft means, slidable means mounted on and accessible at one end of said punch means for severally and selectively shifting said punch means out of interlocking relation with said shaft means to preclude displacement of said punch means upon rotation of said shaft means, means to severally and selectively sustain said punch means out of said interlocking relation, and manipulatable means for driving said shaft means.

23. In combination, a header having an anvil, punching means slidably guided by said header and having a portion extending thereabove, a rotatable shaft extending through said header, coupling means cooperating with said punching means for displacing the latter in a direction towards or away from said anvil upon rotation of said shaft, and means for displacing said portion relative to said header for rendering said coupling means ineffective to preclude displacement of said punching means in a direction towards or away from said anvil upon rotation of said shaft.

24. In combination, a header having an anvil, punching means slidably guided by said header and having a headed portion extending thereabove, a rotatable shaft extending through said header, coupling means cooperating with said punching means for displacing the latter in a direction towards or away from said anvil upon rotation of said shaft, and a sleeve cooperating with and surrounding said portion for bodily elevating said punching means away from said anvil for rendering said coupling means ineffective to preclude displacement of said punching means in a direction towards or away from said anvil upon rotation of said shaft.

25. In combination, a header having an anvil, punching means slidably guided by said header and having a headed portion extending thereabove, a rotatable shaft extending through said header, coupling means cooperating with said punching means for displacing the latter in a direction towards or away from said anvil upon

13

rotation of said shaft, a sleeve cooperating with and surrounding said portion for bodily elevating said punching means for rendering said coupling means ineffective to preclude displacement of said punching means in a direction towards or away from said anvil upon rotation of said shaft, and means cooperating with said sleeve to sustain said punching means elevated.

26. In combination, a header having an anvil, punching means slidably guided by said header and having a headed portion extending thereabove, a rotatable shaft extending through said header, coupling means cooperating with said punching means for displacing the latter in a direction towards or away from said anvil upon rotation of said shaft, a sleeve slidably guided by and surrounding said portion for bodily elevating said punching means for rendering said coupling means ineffective to preclude displacement of said punching means in a direction towards or away from said anvil upon rotation of said shaft, and post means extending from said header and cooperating with said sleeve to sustain said punching means elevated.

27. In combination, a header having an anvil, punching means slidably guided by said header and having a headed portion extending thereabove, a rotatable shaft extending through said header, coupling means cooperating with said punching means for displacing the latter in a direction towards or away from said anvil upon rotation of said shaft, a sleeve slidably guided by and surrounding said portion, spring means interposed between said headed portion and sleeve, the latter adapted to be elevated relative to said header for bodily raising said punching means for rendering said coupling means ineffective to preclude displacement of said punching means in a direction towards or way from said anvil upon rotation of said shaft, and post means for holding said sleeve spaced from said header whereby said punching means is sustained in an uncoupled relation with said shaft.

28. In combination, a header having an anvil, punching means slidably guided by said header and having a headed portion extending thereabove, a rotatable shaft extending through said header, coupling means cooperating with said punching means for displacing the latter in a direction towards or away from said anvil upon rotation of said shaft, a sleeve rotatably and slidably guided by and surrounding said portion, spring means surrounding said portion and disposed within and abutting said sleeve, the latter adapted to be elevated relative to said header for bodily raising said punching means for rendering said coupling means ineffective to preclude displacement of said punching means in a direction towards or away from said anvil upon rotation of said shaft, post means for holding said sleeve spaced from said header whereby said punching means is sustained in an uncoupled relation with said shaft, said sleeve having means removably interlocking with said post means upon rotation of said sleeve relative to said punching means.

29. In a machine for perforating sheet material, a header embodying a sheet receiving throat, means to limit insertion of said material into said throat comprising a rack, a shaft journaled in said header and having a pinion in mesh with said rack, and indicia carrying control means for actuating said shaft to regulate the displacement of said rack relative to said throat.

30. In a machine for perforating sheet material, a header embodying a sheet receiving hori-

14

zontally disposed throat and guide means, means to limit insertion of said material into said throat comprising a rack disposed at the rear of said throat in said guide means, a shaft substantially normal to said rack and journaled in said header and having a pinion in mesh with said rack, and an indicia carrying wheel secured to said shaft for rotating the latter to regulate the projection of said rack into said throat.

31. In a machine for perforating sheet material, a header embodying a sheet receiving throat, means to limit insertion of said material into said throat comprising a toothed member, a shaft journaled in said header and having means in mesh with said member, indicia carrying control means for actuating said shaft to regulate the projection of said member into said throat, and means to limit said projection.

32. In combination, a frame, a platform sustained by said frame and having spaced panels defining a gap, a rod disposed longitudinally of said gap and slidably guided between said panels, a gage disposed transversely of said panels and having means slidably guiding said rod towards or away from said panels, and accessible means adjustably connected to said rod for removably clamping the latter against said panels.

33. In combination, a frame, a platform sustained by said frame and having spaced panels defining a gap, a rod disposed longitudinally of said gap and slidably guided between said panels and having spaced openings, a gage disposed transversely of said panels and having spaced depending means disposed in said openings for slidably guiding said rod towards or away from said panels, and accessible means threadably connected to said rod for removably clamping the latter against said panels.

34. In a perforating machine, a frame having bearing means, a platform sustained by said frame, a header, shaft means removably and rotatably sustained by said bearing means and removably projecting through said header, reinforcing means sustained by said frame and spaced rearwardly of said shaft means, said header including a notched portion for receiving and straddling said reinforcing means and adapted to be removably seated on the latter, and means to prevent displacement of said notched portion relative to said reinforcing means.

35. In a perforating machine, a frame having bearing means, a platform sustained by said frame, a header, shaft means removably and rotatably sustained by said bearing means and removably projecting through said header, a rod disposed longitudinally of said frame and sustained thereby and spaced rearwardly of said shaft means, said header including a rearwardly disposed notched portion for receiving and straddling said rod and adapted to be removably seated on the latter, and adjustable means to prevent displacement of said notched portion relative to said rod.

36. In a perforating machine, a frame having bearing means, a platform sustained by said frame, a header, shaft means removably and rotatably sustained by said bearing means and removably projecting through said header, a threaded rod disposed longitudinally of and sustained by said frame and spaced rearwardly of said shaft means, said header including a tail portion including a notch for receiving and straddling said rod and adapted to be removably seated on the latter, and threaded means cooperating with said threaded rod to preclude dis-

15

placement of said tail portion relative to said rod.

37. In a perforating machine, a frame having bearing means, a platform supported by said frame, a header having a horizontally arranged bore disposed widthwise thereof and having a vertically disposed bore in communication with said horizontally arranged bore, shaft means rotatably disposed in said horizontally arranged bore and said bearing means and including spaced lips defining a longitudinally disposed groove, punch means slidably guided in said vertically disposed bore, a tooth extending from said punch means into said groove to interlock said lips and for linearly but vertically actuating said punch means upon rotation of said shaft means, means mounted on said punch means for shifting the latter out of interlocking relation with said lips, and manipulatable means for driving said shaft means.

38. In a perforating machine, a frame having bearing means, a platform supported by said frame, a header having a horizontally arranged bore disposed widthwise thereof and having a vertically disposed bore in communication with said horizontally arranged bore, shaft means rotatably disposed in said horizontally arranged bore and said bearing means and including spaced diverging lips, punch means slidably guided in said vertically disposed bore, a tooth extending from said punch means into said groove to interlock said lips and for linearly actuating said punch means upon rotation of said shaft means, means mounted on said punch means for shifting the latter out of interlocking relation with said lips, means to maintain said punch means out of said interlocking relation, and manipulatable means for driving said shaft means.

39. In a machine for perforating sheet material, a frame having bearing means, a platform supported by said frame, shaft means rotatably and slidably sustained by said bearing means and including spaced upper and lower lips defining with said shaft means a longitudinally arranged groove, a plurality of headers each having a horizontally disposed bore arranged widthwise thereof for rotatably and slidably guiding said shaft means and each having a vertically arranged bore in communication with its respective horizontal bore, punch means slidably guided in said vertically arranged bores and each having toothed means removably arranged in said groove and adapted to be actuated by said upper or lower lips, a handle secured to said shaft means for rotating the latter, selective means movably retained on said punch means for severally elevating the latter and consequently its respective toothed means to arrange the latter clear of and above said lips to preclude actuation of said elevated punch means by said shaft means, and means to maintain said elevated punch means elevated.

40. In combination, a rotatable shaft having upper and lower lips, a slidably guided punch having a tooth in mesh and severally engageable with said lips and removably interposed therebetween, accessible means mounted on said punch and adapted to raise the latter bodily and elevate said tooth to be clear of and out of mesh with said lips, and means to sustain said accessible means elevated for continuing to hold said tooth out of mesh with said lips.

41. In a machine for perforating sheet material, a frame having bearing means, a platform sup-

16

ported by said frame, shaft means rotatably and slidably sustained by said bearing means and including spaced upper and lower lips defining with said shaft means a longitudinally arranged groove and including spaced positioning means, a plurality of headers each having a horizontally disposed bore arranged widthwise thereof for rotatably and slidably guiding said shaft means and each having a vertically arranged bore in communication with its respective horizontally arranged bore, punch means slidably guided in said vertically arranged bores and removably interlocking with said positioning means for setting said headers a predetermined distance apart and to prevent displacement of said headers longitudinally of said shaft means and each of said punch means having toothed means removably arranged in said groove and adapted to be actuated by said upper or lower lips, a handle secured to said shaft means for rotating the latter, and selective means movably retained on said punch means for severally elevating the latter and consequently its respective toothed means to arrange the latter clear of and above said lips to preclude actuation of said elevated punch means by said shaft means.

42. In a machine for perforating sheet material, a frame having bearing means, a platform supported by said frame, shaft means rotatably and slidably sustained by said bearing means and including spaced upper and lower lips defining with said shaft means a longitudinally arranged groove and including spaced positioning means, a plurality of headers each having a horizontally disposed bore arranged widthwise thereof for rotatably and slidably guiding said shaft means and each having a vertically arranged bore in communication with its respective horizontally arranged bore, a plurality of punch means slidably guided in said vertically arranged bores and removably interlocking with said positioning means for setting said plurality of headers a predetermined distance apart and to prevent displacement of said headers longitudinally of said shaft means and each of said punch means having toothed means removably arranged in said groove and adapted to be actuated by said upper or lower lips, a handle secured to said shaft means for rotating the latter, selective means movably retained on said punch means for severally elevating the latter and consequently its respective toothed means to arrange the latter clear of and above said lips to preclude actuation of said elevated punch means by said shaft means, and means to sustain said elevated punch means elevated.

43. In a machine for perforating sheet material, a frame having bearing means, a platform supported by said frame, shaft means rotatably and slidably sustained by said bearing means and including spaced upper and lower lips defining with said shaft means a longitudinally arranged groove and including notches spaced longitudinally thereof, a plurality of headers each having a horizontally disposed bore arranged widthwise thereof for rotatably and slidably guiding said shaft means and each having a vertically arranged bore in communication with its respective horizontally arranged bore, punch means slidably guided in said vertically arranged bores and removably interlocking with the walls of said notches for setting said headers a predetermined distance apart and to prevent accidental displacement of said headers longitudinally of said shaft means and each of said punch means having toothed means removably arranged in said

17

groove and adapted to be actuated by said upper or lower lips, a handle secured to said shaft means for rotating the latter, and selective means movably retained on said punch means for severally elevating the latter and consequently its respective toothed means to arrange the latter clear of and above said lips to preclude actuation of said elevated punch means by said shaft means.

44. In a machine for perforating sheet material, a frame having bearing means, a platform supported by said frame, shaft means rotatably and slidably sustained by said bearing means and including spaced upper and lower lips defining with said shaft means a longitudinally arranged groove and including a notch, a header having a horizontally disposed bore arranged widthwise thereof for rotatably and slidably guiding said shaft means and having a vertically arranged bore in communication with said horizontally arranged bore, punch means slidably guided in said vertically arranged bore and removably interlocking with the wall of said notch to prevent displacement of said header longitudinally of said shaft means and said punch means having toothed means removably arranged in said groove and adapted to be actuated by said upper or lower lips, a handle secured to said shaft means for rotating the latter, and selective means movably retained on said punch means for elevating the latter and consequently said toothed means to arrange the latter clear of and above said lips to preclude actuation of said punch means by said shaft means.

45. In a machine for perforating sheet material, a frame having bearing means, a platform supported by said frame, shaft means rotatably and slidably sustained by said bearing means and including spaced upper and lower lips defining with said shaft means a longitudinally arranged groove and including spaced positioning means, a plurality of headers each having a horizontally disposed bore arranged widthwise thereof for rotatably and slidably guiding said shaft means and each having a vertically arranged bore in communication with its respective horizontally arranged bore, punch means slidably guided in said vertically arranged bores and removably interlocking with said positioning means for setting said headers a predetermined distance apart and to prevent accidental displacement of said headers longitudinally of said shaft means and each of said punch means having toothed means removably arranged in said groove and adapted to be actuated by said upper or lower lips, and a handle secured to said shaft means for rotating the latter.

46. In a machine for perforating sheet material, a frame having bearing means, a platform supported by said frame, shaft means rotatably and slidably sustained by said bearing means and including spaced upper and lower lips defining with said shaft means a longitudinally arranged groove and including notches spaced longitudinally thereof, a plurality of headers each having a horizontally disposed bore arranged widthwise thereof for rotatably and slidably guiding said shaft means and each having a vertically arranged bore in communication with its respective horizontally arranged bore, punch means slidably guided in said vertically arranged bores and removably interlocking with the walls of said notches for setting said headers a predetermined distance apart and to prevent accidental dis-

18

placement of said headers longitudinally of said shaft means and each of said punch means having toothed means removably arranged in said groove and adapted to be actuated by said upper or lower lips, and a handle secured to said shaft means for rotating the latter.

47. In a perforating machine, a frame having bearing means, a platform supported by said frame, a plurality of headers, shaft means rotatably and removably sustained by said bearing means and having spaced positioning means, punch means slidably guided by said headers and having means removably receivable by said positioning means to interlock with the latter, and means to interlock said shaft means with said punch means for actuating the latter upon rotation of said shaft means.

48. In a perforating device, bearing means, a shaft journaled in said bearing means and having a reduced portion, a movable member having means for removably interlocking with said reduced portion to preclude longitudinal displacement of said shaft relative to said bearing means, and means carried by said bearing means for sustaining said movable member.

49. In a perforating machine, a frame having bearing means, a platform sustained by said frame, a header, shaft means removably and rotatably sustained by said bearing means and removably projecting through said header, a rod disposed longitudinally of said frame, means supporting said rod at the rear of said frame, said header including a rearwardly disposed notched portion defining an unobstructed downwardly facing groove for receiving said rod and including a wall in part fitting over and adapted to be removably seated on the latter, and adjustable means cooperating with said rod to prevent longitudinal displacement of said header relative to said rod.

50. In a perforating machine, a frame having bearing means, a platform sustained by said frame, a header, shaft means removably and rotatably sustained by said bearing means and removably projecting through said header, a threaded cylindrical rod disposed longitudinally of said frame, means supporting said rod at the rear of said frame, said header including a rearwardly disposed notched portion defining an unobstructed downwardly facing groove for receiving said rod and including in part an arcuate wall in part fitting over and adapted to be removably seated on the latter, and a threaded set screw carried by said portion and having pointed means cooperating with the threads of said rod to prevent longitudinal displacement of said header relative to said rod.

SAMUEL SEGAL.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
806,914	Pitt	Dec. 12, 1905
1,129,652	Dom	Feb. 23, 1915
1,655,315	Finley	Jan. 3, 1928

FOREIGN PATENTS

Number	Country	Date
456,867	Great Britain	Nov. 17, 1936