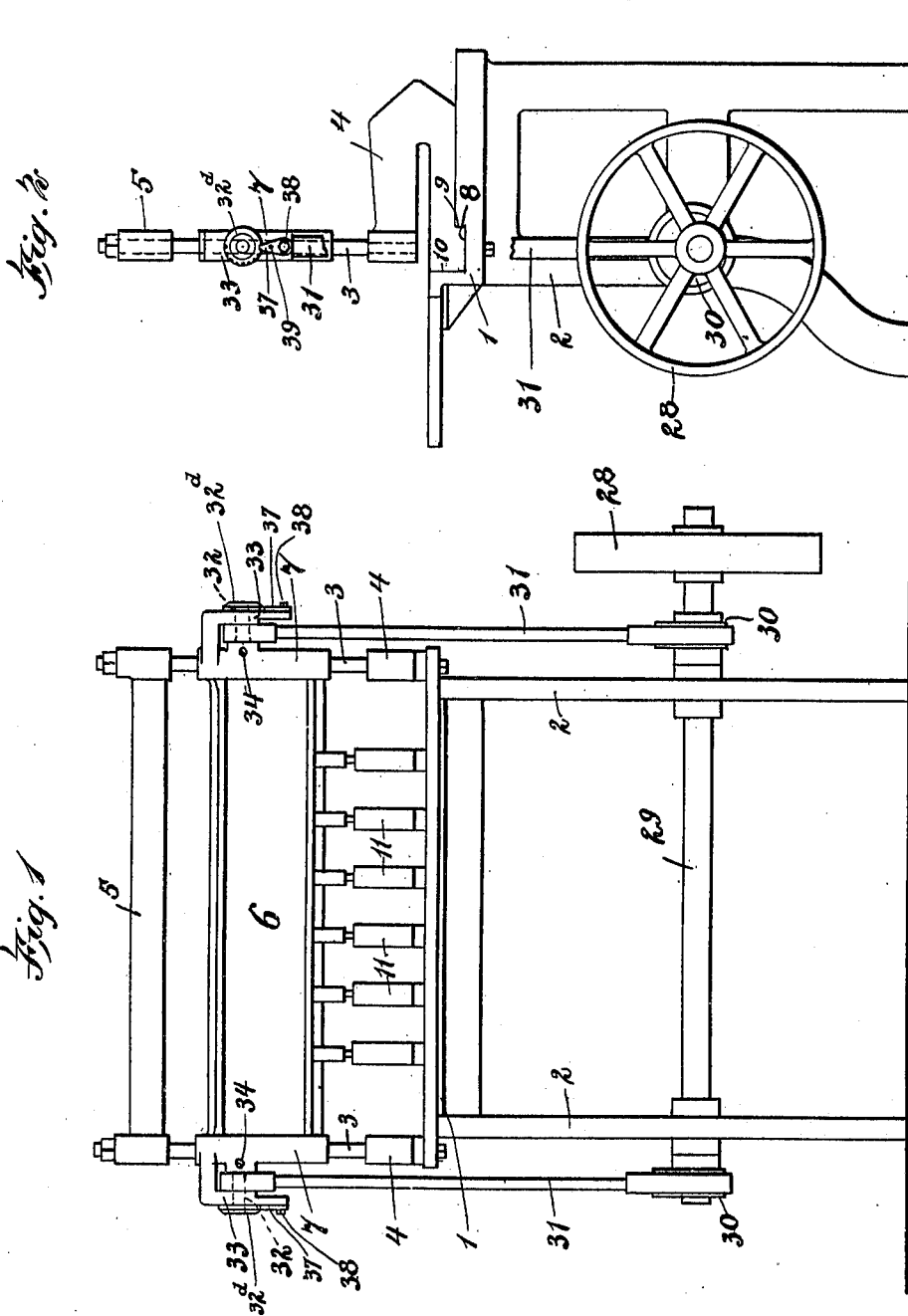


E. B. STIMPSON.
PUNCHING MACHINE.
APPLICATION FILED NOV. 19, 1909.

978,506.

Patented Dec. 13, 1910.

3 SHEETS-SHEET 1.



Witnesses:
H. D. Smith
E. B. Newton

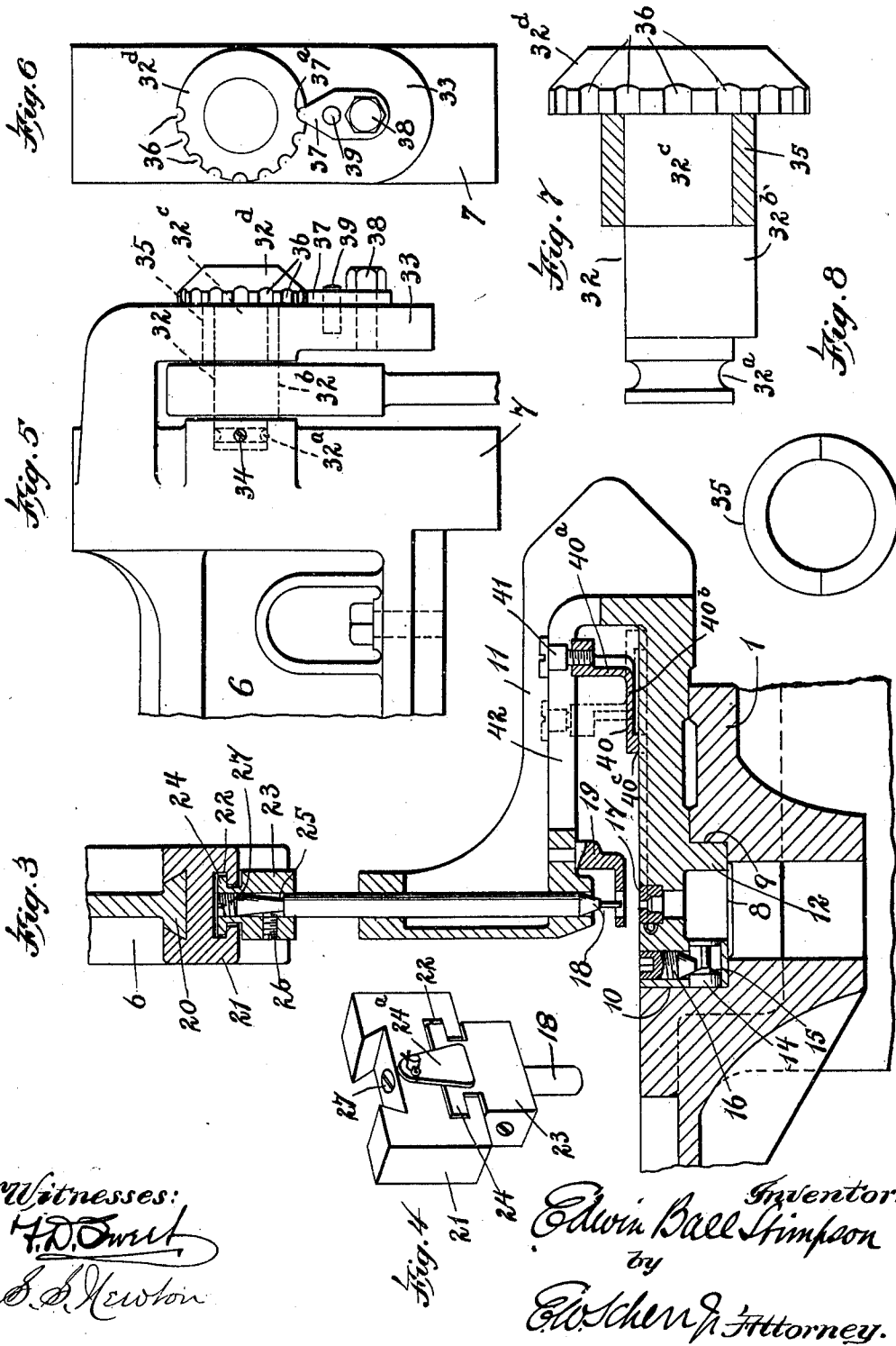
Edwin Bace Stimpson Inventor.
by
E. B. Schenck Attorney.

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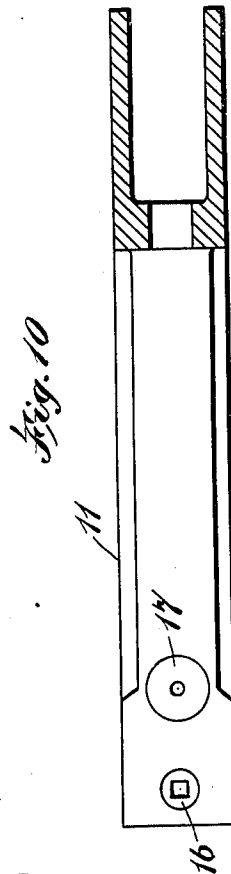
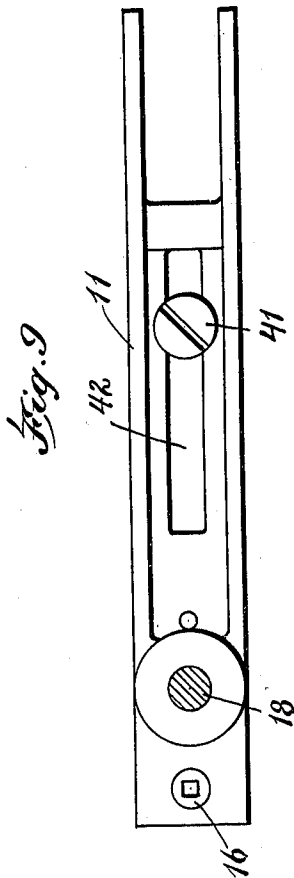
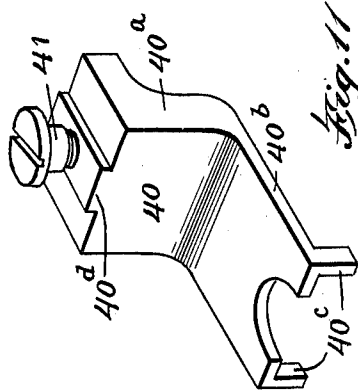
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UNITED STATES PATENT OFFICE.

EDWIN BALL STIMPSON, OF BROOKLYN, NEW YORK, ASSIGNOR TO EDWIN B. STIMPSON COMPANY, A CORPORATION OF NEW YORK.

PUNCHING-MACHINE.

978,506.

Specification of Letters Patent.

Patented Dec. 13, 1910.

Application filed November 19, 1909. Serial No. 528,866.

To all whom it may concern:

Be it known that I, EDWIN BALL STIMPSON, a citizen of the United States, and resident of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Punching-Machines, of which the following is a specification.

My invention relates to a machine for punching a plurality of holes through the given material, the distance between the holes being adjustable.

More particularly, my invention relates to specific improvements to such a machine including the following: first, improved means for releasably locking the sub-press to the bed; second, an improved, adjustable gage for regulating the feed of the sheets of material to be punched; third, improved means for supporting the individual punches from the cross-head; fourth, means for taking up the wear on the punches; fifth, improved means for connecting the eccentric rods to the cross-head; sixth, improved means for regulating the distance between the cross-head and the bed.

These and other improvements and advantages will appear from an understanding of the annexed description and drawings.

In the drawings which show only one of the forms which my improvements may take, Figure 1 is a front elevation of a machine within my invention; Fig. 2 is a side elevation thereof seen from the right in Fig. 1; Fig. 3 is a partial view on an enlarged scale and is a vertical section partly in elevation through the cross-head, one of the sub-presses and the bed of the machine; Fig. 4 is a perspective view of the slide, punch block and part of the punch; Fig. 5 is a partial view on an enlarged scale, being the upper right hand portion of the machine as shown in Fig. 1; Fig. 6 is a view in elevation looking at Fig. 5 from the right; Fig. 7 is an enlarged view of one of the pins showing in section the split bushing as applied to the pin; Fig. 8 is an end elevation of the split bushing; Fig. 9 is a combination horizontal section and plan view of one of the sub-presses detached from the machine, the section being taken through the punch at its upper or head end; Fig. 10 is a combination horizontal section and plan view taken

through one of the sub-presses at a point between the two arms; Fig. 11 is a perspective view of the gage detached.

Describing now the devices of the drawings and reserving it to the claims to point out the novel features, and to indicate the scope of the invention, 1 is the bed-plate of the machine supported on legs 2. 3 are posts having goose-necks 4 extending in fore and aft direction as shown, whereby sheets of material of any length, even much greater than the length of the machine bed, may be fed under the punches. A cross piece 5 rigidly connects the tops of these posts.

6 is the cross-head having sleeves 7 at its ends which slidably receive the posts 3 to permit up and down motion of the cross-head.

The bed-plate has a longitudinal trough 8, the rear side 9 of which is lower than the front side 10.

11 is a sub-press of general goose-neck shape corresponding to the goose-necks 4 of the posts. Its lower portion has a trough-fitting downward extension or projection 12 fitting down between the sides of the trough. Said sub-press can be adjusted laterally along the bed-plate trough but may be locked in any given position thereon by means next to be described. This locking means consists of a cylindrical member 14 loosely housed in a corresponding opening or socket in the front of the trough-fitting projection 12 of the sub-press. Said cylindrical member has an annular recess about its middle portion, the front wall 15 of which is beveled or tapering. In a suitable threaded opening in the sub-press is a set-screw 16 whose beveled end is adapted to bear against the bevel 15 and force the cylindrical member 14 outwardly into contact with the front wall of the bed-plate trough. Obviously, upon taking up sufficiently on the set-screw 16, the trough-fitting projection 12 can be locked rigidly between the sides of the bed-plate trough, and consequently the sub-press is anchored in stationary position. The fact that the cylindrical member 14 is able to rotate about its own axis in its socket in the sub-press, prevents the set-screw 16 from always bearing upon it in the same place.

17 is a die suitably mounted in the lower

portion of the goose-neck of the sub-press, the axis of the die being vertical and the die being over an opening in the sub-press for the punchings to drop through. In vertical
 5 alinement over the die is a punch 18 reciprocating in a vertical opening through the upper portion of the goose-neck of the sub-press.

19 is a stripper.

10 The lower edge 20 of the cross-head is dovetailed. From this edge, the punch is supported as follows: 21 is a slide having a dovetailed recess that slidably receives the dovetailed edge of the cross-head, whereby
 15 the slide is suspended therefrom. The opposite or bottom portion of the slide is provided with another recess 22. 23 is a punch block having a head 24 that is slidably receivable into the recess 22 of the slide and
 20 by which the punch block is suspended from said slide. 24 are plates pivoted to the ends of the slide and normally hanging down in closing position over the ends of the recess 22 whereby the punch block is re-
 25 tained in the recess but from which it is readily removed by pivoting the plate or plates 24 out of obstructing position and then sliding the punch block endwise to detach it from the slide.

30 The punch block has a vertical opening through it to receive the head of the punch 18, said head having an annular recess with inclined bottom 25. 26 is a set-screw in the punch block bearing against the inclined
 35 bottom 25 of the recess.

27 is a feed-screw in the upper portion of the punch block opening, the latter being suitably threaded for the purpose, said screw bearing against the top of the punch head.
 40 The purpose of the feed-screw 27 is that it is a means for taking up wear on the punch. Thus, as the latter becomes shorter through grinding, the feed-screw is fed inwardly to a corresponding extent, the set-screw 26 hav-
 45 ing, of course, been first loosened. This same feature makes it similarly easy to replace one punch by another, although of different length.

It will be noted that the punch block 23
 50 and the punch 18 are supported in strict vertical alinement under the cross-head. In addition, the intention is to have the fit between the punch block 23 and the slide 21 a loose one. Similarly, to have a loose fit be-
 55 tween the head end of the punch and the punch block, whereby all of these parts are permitted to have play to conform themselves, in whatever direction may be re-
 60 quired, to the vertical movement of the cross-head as confined by its guides, and to the vertical movement of the punch as confined by the guide-openings in the upper arm of its sub-press 11. The result is that
 65 the punch is saved from lateral strains tending to snap it and the friction of its sliding

contact with the guide-openings in its sub-press 11 is kept at a minimum.

As a matter of convenience, the screw 26 projecting from the punch block into the recess in the head end of the punch has been
 70 spoken of as a set-screw. More accurately speaking, however, it is an adjustable stop because its object is merely to prevent the punch from dropping down out of its socket
 75 in the punch block and not to rigidly bear against and confine the head end of the punch in said socket, as the term set-screw would ordinarily imply. Thus, the proper
 80 adjustment of this set-screw 26 and of the feed-screw 27 is to allow a little play between the punch and the punch block for the purpose already pointed out. Thus, to readjust the punch to proper length after
 85 same has been worn down and resharpened, the set-screw 26 is adjusted to bear against such portion of the inclined bottom of the recess in the head of the punch with just
 90 sufficient effect to uphold the punch at the proper elevation relative to its die. Then the feed-screw 24 is fed downwardly until
 95 it reaches a position just short of contact with the top of the punch. It will be obvious how the inclined bottom of the afore-said recess permits the set-screw 26 to en-
 100 gage it along various points of its length corresponding to the successive shortenings in the length of the punch as it wears down.

The description thus far has described only one sub-press, punch and punch-sup-
 105 porting means, but it will be understood that there will be a plurality of sets of these parts all connected up between the bed-plate and cross-head as described, and all located side
 110 by side adjusted to such distances apart as may be required to effect the desired punch-
 115 ings.

A single down stroke of the cross-head punches as many holes through the article
 120 as there are punches. The reciprocation of the cross-head is effected as follows: 28 is the drive pulley, 29 the driving shaft, and
 125 30 are eccentrics on said shaft which reciprocate the cross-head through eccentric rods 31. The upper end of the eccentric rods 31
 130 are journaled on pins 32 supported across a space or recess between the sleeve 7 of the cross-head and the depending arms 33 of
 135 right-angled extensions from said sleeves. One of these pins 32 is shown detached in Fig. 7. Near its free end is an annular re-
 140 cess 32^a into which bears a set-screw 34 on the cross-head preventing the pin from working endwise out of its position in Figs.
 145 1 and 5. The middle portion 32^b on the pin is eccentric, this being the portion to which the particular eccentric rod is journaled.
 150 The portion 32^c of the pin is surrounded by a split bushing 35, which latter fits the opening through the depending arm 33, said
 155 opening being large enough to permit the

eccentric portion 32^b of the pin to pass. 32^a is the head of the pin, the rim of which is provided at intervals with notches 36 for the purpose hereinafter mentioned. To assemble these pin parts, the pin is partly inserted into its supporting opening and through the opening in the eccentric rod; then the halves of the split bushing are applied to the 32^c portion of the pin, and the pin and bushing thereupon pushed fully home into the supporting opening. It will be understood that the split bushing referred to is cylindrical and made up of two separate halves. The two halves in assembled position are shown in end view in Fig. 8. Next, the set-screw 34 is screwed into the annulus 32^a of the pin but not so far as to prevent its free rotation. The above method of assembling will naturally apply also to the other pin 32 on the opposite side of the machine. It will be evident that rotating these pins 32 through a greater or less angle of rotation will vary the relation of their eccentric portion 32^b to the eccentric rods 31, and will consequently vary the distance between the cross-head and the bed. These pins 32, therefore, constitute means for adjusting the height of the cross-head to correspond, for example, to the length of the particular punches being used. The pins, having been given the proper rotary adjustment, are locked in that position by members 37, each of which is attached to the depending arm 33 by a nut-headed screw 38; each of said members 37 also has an opening receivable over a pin 39 projecting from arm 33, also a pointed end 37^a receivable into the notches 36. Thus having adjusted the particular pin 32 as desired, the locking member 37 is seated upon the pin 39 with its pointed end 37^a engaging the nearest notch 36, whereupon the screw 38 is tightened up and the pin is locked against accidental rotation.

Reverting now to the sub-presses, each will have a gage like that shown at 40 in Fig. 3. Said gage has a vertical body portion 40^a and a lower horizontal extension 40^b from which depend feet 40^c that straddle the side edges of the lower arm of the goose-neck. The upper arm of the goose-neck is longitudinally slotted at 42. 41 is a screw connecting with the gage through said slot, the head of the screw overhanging the sides of the slot and the gage underhanging said sides below, so that taking up on the screw supports the gage from the upper arm of the sub-press and locks it thereto in any given position of lengthwise adjustment on said arm. The gage has a reduced straight-sided portion 40^d on its top receivable with sliding fit between the sides of the aforesaid slot 42 in the arm of the goose-neck, thereby limiting lateral play of the gage in sliding it as described for the purpose of adjustment.

Thus, it will be seen that the gage 40 can be adjusted from the position shown in full lines in Fig. 3 into an extreme forward position as far as can ever possibly be acquired in practice. On the other hand, by loosening up the screw 41, the gage 40 can be reversed into the position shown in dotted lines in Fig. 3 so that rearward adjustment of the gage to full extent is now obtained, the only difference being that the edge of the sheet of material to be punched is now received against the inner side of the gage feet 40^c instead of against their outer side.

What I claim is:

1. In a machine of the class described, the combination of a bed provided with a trough, a block slidable longitudinally in said trough, a cylindrical member having one end directed toward one wall of the trough and being positioned rotatably in a suitable socket in the block, said cylindrical member having an annular recess around it, and a set-screw in the block located to have its end bear against the side of the annular recess, one of said parts, meaning the end of the set-screw and the side of the annular recess, being tapering, as and for the purpose set forth.

2. In a machine of the class described, the combination of a bed provided with a trough, a block slidable longitudinally in said trough, a cylindrical member having one end directed toward one wall of the trough and being positioned rotatably in a suitable socket in the block, said cylindrical member having an annular recess around it, a set-screw in the block located so that its end bears against the side of said annular recess that is nearer the aforesaid wall of the trough, one of said parts, meaning the end of the set-screw and the said side of the annular recess, being tapering whereby feeding the screw toward the cylindrical member forces said member endwise against the side of the trough.

3. In a machine of the class described, the combination of a cross-head, a slide under the cross-head supported from its bottom edge and being adjustable along said edge, said slide having a recess in its bottom under the cross-head and extending lengthwise thereof for removably supporting a punch block, said block having a top portion receivable loosely in said recess, and means on said block supporting a punch in vertical alinement under the cross-head.

4. In a machine of the class described, the combination of a punch having an annular recess near its head end, the bottom of said recess inclining toward the cutting end of the punch, a punch support having an opening receiving the head end of the punch, a set-screw in said support directed into the annular recess of the punch and acting as a stop to prevent the punch from dropping

by contacting with the inclined bottom of the recess, and a feed screw in the upper end of the punch-support opening.

5. In a machine of the class described, the combination of a reciprocating cross-head, an eccentric rod for reciprocating said cross-head, a rotatable pin carried by the cross-head having an eccentric portion by which the eccentric rod is connected with the cross-head, and releasable means for locking the pin in different positions of rotation.

6. In a machine of the class described, the combination of a reciprocating cross-head having a recess to receive the end of an eccentric rod for reciprocating said cross-head, said eccentric rod, a rotatable and removable pin extending across the recess through suitable openings in the sides of said recess, said pin at the recess having an eccentric portion with which the eccentric rod connects, and a split bushing surrounding the pin at its head end and fitting the opening in the corresponding side of the recess, said opening being large enough to permit the eccentric portion of the pin to pass when inserting and removing the pin.

7. In a machine of the class described, the combination of a reciprocating cross-head having a recess to receive the end of an eccentric rod for reciprocating said cross-head, said eccentric rod, a rotatable and removable pin extending across the recess through suitable openings in the sides of said recess, said pin at the recess having an eccentric portion with which the eccentric rod connects, a split washer surrounding the pin at its head end and fitting the opening in the corresponding side of the recess, said opening being large enough to permit the eccentric portion of the pin to pass when inserting and removing the pin, the pin further having an annular recess at its entering end, and a set-screw in the cross-head directed into said recess.

8. In a machine of the class described, the combination of a reciprocating cross-head having a recess receiving the end of an eccentric rod for reciprocating the cross-head, said eccentric rod, a rotatable and removable pin extending across the recess through suit-

able openings in the sides of said recess, said pin at the recess having an eccentric portion with which the eccentric rod connects, also having a head the rim of which is formed with notches, a split washer surrounding the pin between its eccentric portion and its head and fitting the opening in the corresponding side of the recess, said opening being large enough to permit the eccentric portion of the pin to pass in inserting and removing the pin, and a locking member on the cross-head engageable with the notches of the head of the pin.

9. In a machine of the class described, the combination of a bed-plate, a cross-head, cross-head supporting posts provided with fore and aft extending goose-neck bases, whereby sheets of material greater than the length of the bed-plate may be fed to the machine.

10. In a machine of the class described, the combination of a goose-neck sub-press having a longitudinally slotted upper arm, a gage consisting of a vertical body portion, and a lower horizontal extension from which depend feet that straddle the sides of the lower arm of the goose-neck, and a screw entering the body portion of the gage through said slot and supporting the gage adjustably along the upper sub-press arm.

11. In a machine of the class described, the combination of a goose-neck sub-press having a longitudinally slotted upper arm, a gage consisting of a vertical body portion and a lower horizontal extension from which depend feet that straddle the sides of the lower arm of the goose-neck, the top of said body portion of the gage being straight-sided to enter up into the slot of the goose-neck arm, and being adjustable longitudinally therein with sliding fit, and a screw entering the body portion of the gage through said slot and supporting the gage adjustably along the upper sub-press arm.

Witness my hand this 13th day of November 1909, at the city of New York.

EDWIN BALL STIMPSON.

Witnesses:

E. W. SCHERR, Jr.,

S. S. NEWTON.