

(No Model.)

2 Sheets—Sheet 1.

C. WEBER & H. SCHNEIDER.  
PUNCHING AND SHEARING MACHINE.

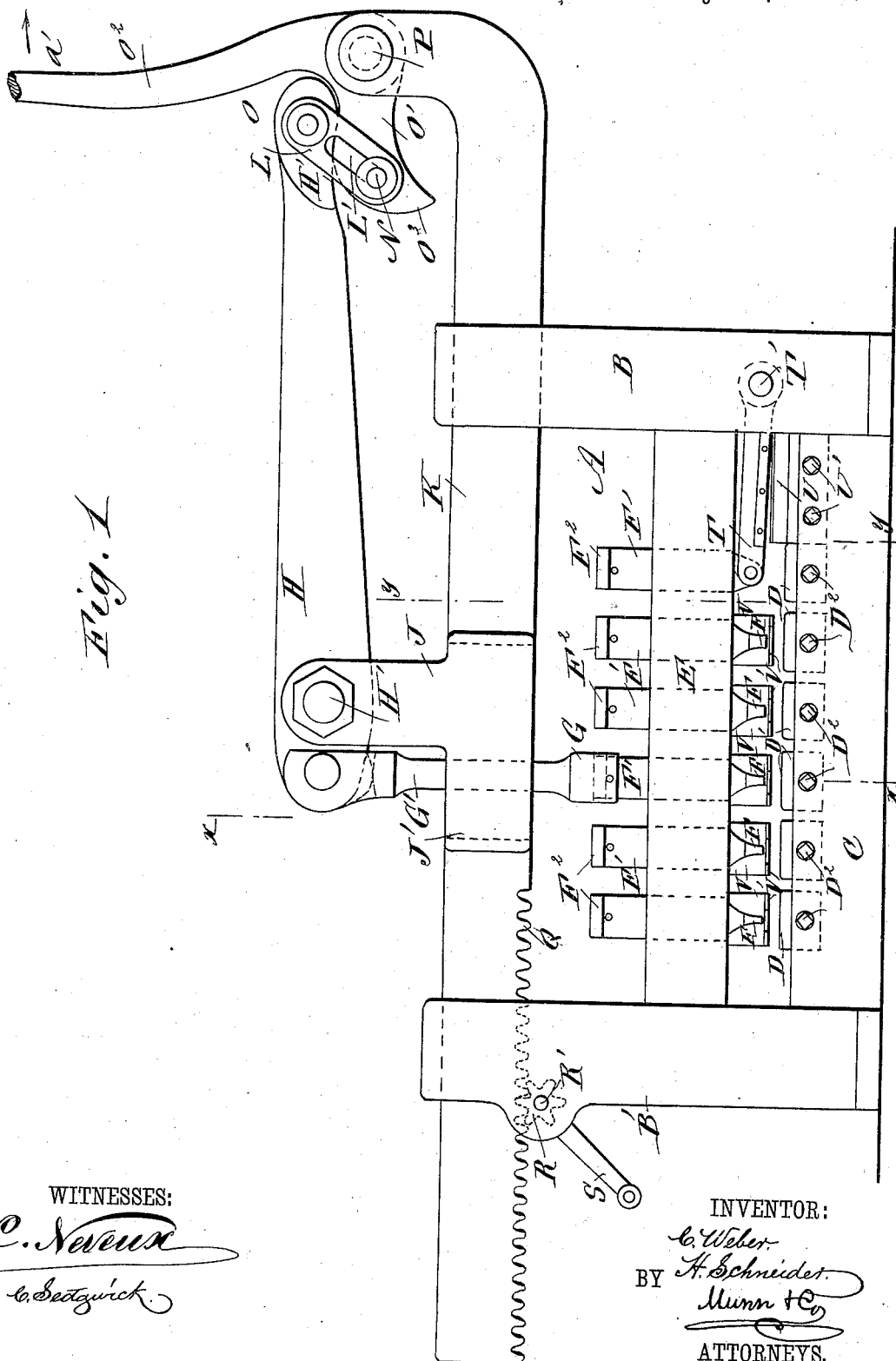
No. 383,200.

Patented May 22, 1888.

Fig. 1

WITNESSES:  
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INVENTOR:  
*C. Weber*  
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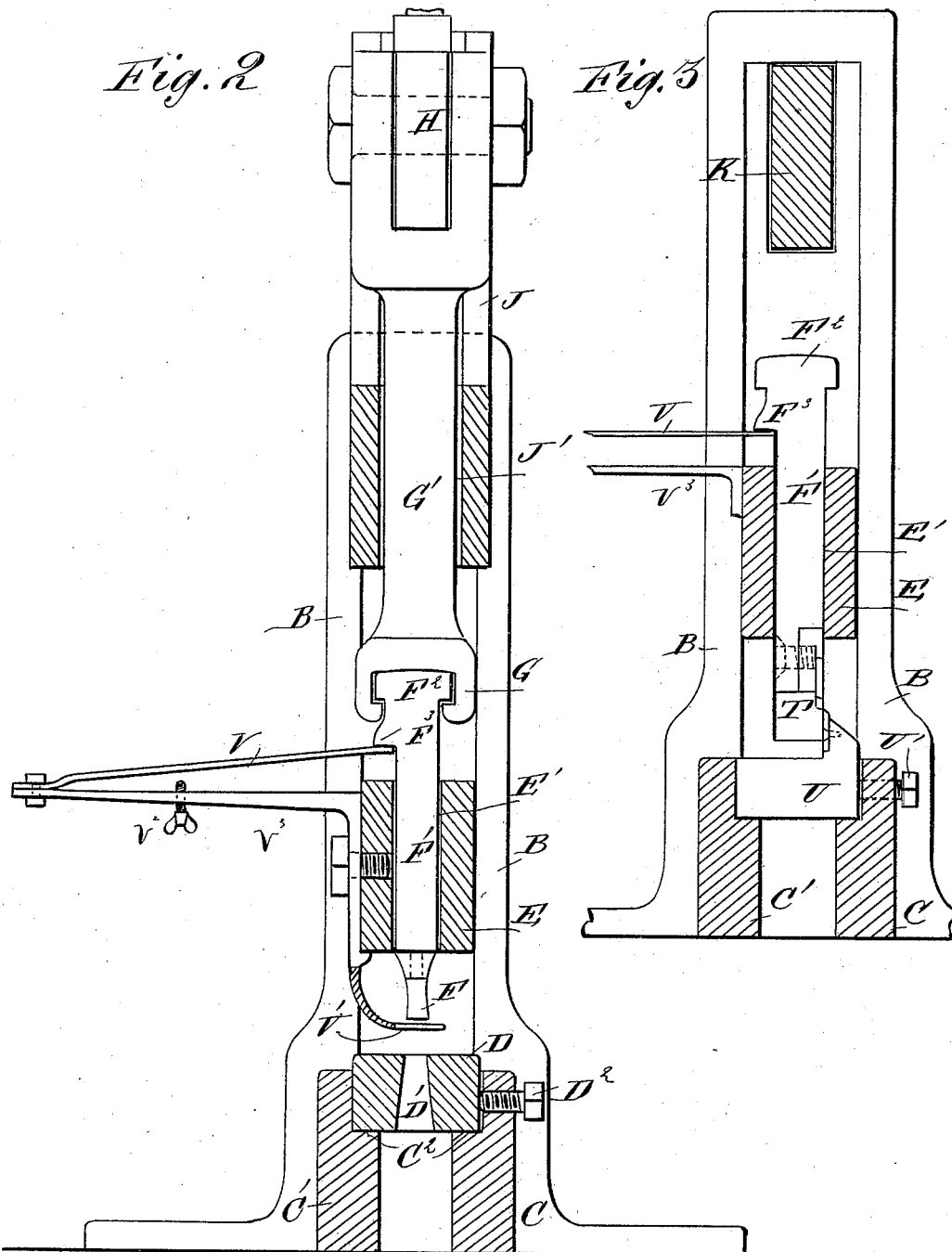
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WITNESSES:

*C. Seveux.*

C. Sedgwick.

INVENTOR:

BY *C. Weber*  
*H. Schneider*  
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# UNITED STATES PATENT OFFICE.

CLAUS WEBER AND HENRY SCHNEIDER, OF PARKER, DAKOTA TERRITORY.

## PUNCHING AND SHEARING MACHINE.

SPECIFICATION forming part of Letters Patent No. 383,200, dated May 22, 1888.

Application filed December 27, 1887. Serial No. 250,055. (No model.)

*To all whom it may concern:*

Be it known that we, CLAUS WEBER and HENRY SCHNEIDER, of Parker, in the county of Turner and Territory of Dakota, have invented a new and Improved Punching and Shearing Machine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved punching and shearing machine adapted for universal use.

The invention consists of a series of different-sized punches and a shear adapted to be engaged alternately at their heads by a link pivotally connected with a lever fulcrumed on a longitudinally-sliding bar held above the punch and shear heads.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement. Fig. 2 is an enlarged vertical cross-section of the same on the line *xx* of Fig. 1, and Fig. 3 is a like view of the same on the line *yy* of Fig. 1.

The frame *A* is provided with two standards, *B* and *B'*, connected with each other at their lower ends by the bars *C* and *C'*, each having a shoulder, *C<sup>2</sup>*, at its inner edge. In the recess formed by these shoulders the dies *D*, provided with the conical apertures *D'*, are held in place on the said bars *C* and *C'* by a set-screw, *D<sup>2</sup>*, screwing in one of the said bars and against one side of each die *D*.

The central apertures of the dies *D* vary in size, and are engaged by punches *F*, which correspond in size, and are held above the said dies *D* and provided with shanks *F'*, adapted to slide vertically in the apertures *E'*, formed in the longitudinal beam *E*, secured to the standards *B* and *B'*. Each of the punch-shanks *F'* is provided with a head, *F<sup>2</sup>*, adapted to be engaged by a correspondingly-shaped holder, *G*, secured to the lower end of a link, *G'*, pivotally connected at its upper end with the short end of a lever, *H*, fulcrumed at *H'* in a projection, *J*, secured on the bar *K*, adapted to slidelongitudinally in suitable bearings formed

in the upper ends of the standards *B* and *B'*. Between the lugs or projections *J* on the bar *K* is formed a slot, *J'*, through which said link *G'* passes, and the said slot *J'* is made large enough so as to permit of passing one of the punches *F*, with its shank *F'* and head *F<sup>2</sup>*, through said slot in case of changing said punch.

The long end of the lever *H* carries a link, *L*, provided with a slot, *L'*, through which passes a bolt, *N*, held on the arm *O'* of the bell-crank lever *O*, fulcrumed at *P* to one outer end of the bar *K*. The other arm, *O<sup>2</sup>*, of the bell-crank lever is formed into a handle for operating the lever *H* and the punches *F*, as hereinafter more fully described. The top edge, *O<sup>3</sup>*, of the arm *O'* of the bell-crank lever *O* is curved, and is adapted to engage the lower curved edge of the long end of the lever *H*, for the purpose of raising said long end of the lever *H* and depressing its short end, which carries the link *G'*. The link *L* serves to move the long end of the lever *H* downward and its other end, carrying the link *G'*, upward.

At one end of the bar *K*, at its bottom edge, is formed a rack, *Q*, meshing into a pinion, *R*, secured on the shaft *R'*, having its bearings in the standard *B'* and provided with a crank-arm, *S*, for turning the said shaft *R'* and its pinion *R*, so that the bar *K* is moved longitudinally in its bearings in the standards *B* and *B'*.

One of the shanks *F'*, instead of carrying a punch, *F*, is connected pivotally with the free end of the shear-arm *T*, fulcrumed at *T'* to the standard *B* and operating on the fixed shear-block *U*, held on the longitudinal bars *C* and *C'* by means of the set screws *U'*, as shown in Figs. 1 and 2. The shanks *F'*, carrying the punches *F* and the shear-arm *T*, are held in an uppermost position by means of the spring *V* engaging with one free end of a shoulder, *F<sup>3</sup>*, formed on each of the said shanks *F'*. Each spring *V* is secured to the rear end of an arm, *V<sup>2</sup>*, secured to the longitudinal beam *E*, and its lower end extends downward and forward under the respective punch *F*, being forked, so that the said punch *F* will pass downward between the tines of the said fork of the end *V'* of the spring *V*. A set-screw, *V<sup>3</sup>*, screwing on the arm *V'*, serves to adjust the height of the spring *V*, so as to bring all the heads *F<sup>2</sup>* in line.

The operation is as follows: By turning the crank-arm S the operator is enabled to move the bar K longitudinally in the standards B and B', so that the holder G, held on the link G', can engage one of the heads F<sup>2</sup> of the shanks F', carrying the punches F and the shear-blade T. When the holder G has engaged one of the heads F<sup>2</sup>, as shown in Figs. 1 and 2, and the operator moves the arm O<sup>2</sup> of the bell-crank lever O backward in the direction of the arrow a', the other arm, O', acting with its curved part O<sup>3</sup> on the curved bottom H' of the lever H, causes the long arm of the said lever to swing upward and its short arm to swing downward, whereby the link G' and the holder G are also moved downward and press the shank F', carrying the punch F downward through the plate to be punched and held on top of the respective die D. The punch F thus punches a hole in the plate held on the die D and the punched-out part of the plate passes into the respective central aperture, D', of the die D. The punched-out part drops out of the die D, on account of the conical shape of the aperture D'. When the operator moves the arm O<sup>2</sup> of the bell-crank lever O in the inverse direction of the arrow a', its other arm, O', acts by means of the bolt N on the link L and pulls the long end of the lever H downward, thus raising the short end of the lever H with the link G' and the holder G, and as the latter engages the respective head F<sup>2</sup> of the shank F' the latter, with its punch F, is raised out of the die D and the punched plate. The latter is prevented from moving upward when the punch F is backed out by the forked end V' of the spring V. The several punches F and their respective shanks F' and heads F<sup>2</sup> are always held in their highest positions by the springs V, which are compressed on the downward movement of the holder G, as above described.

When the operator desires to cut a plate, he places it between the stationary shear-block U and the shear T, which is held in its uppermost open position by the spring V pressing against the shoulder F<sup>3</sup> of the shank F', connected with the short arm T. When the operator now desires to cut, he first turns the crank-arm S so as to move the bar K longitudinally until the holder G engages the head F<sup>2</sup> of the last shank F', and then moves the bell-crank lever O, with its arm O<sup>2</sup>, in the direction of the arrow a', as above described, so that the shank is pressed downward, thereby imparting a swinging downward motion to the shear-arm T, which thus cuts the plate held on the shear-block U.

It will be seen that the operator is enabled to punch different-sized holes on this machine, and he can vary the shape, size, and form of the different punches F to suit the holes he desires to punch in the plate to be operated upon. The dies D are changed to correspond with the shape of the punches F held above the respective dies.

Having thus described our invention, what

we claim as new, and desire to secure by Letters Patent, is—

1. In a punching and shearing machine, the combination, with a series of different sized punches and corresponding dies, of a holder adapted to engage successively the heads of the said punches, a lever for operating the said holder, a longitudinally-sliding bar on which the said lever is fulcrumed, and means for operating said bar, substantially as shown and described.

2. In a punching and shearing machine, a series of different-sized punches, corresponding dies, a shear-block, and a shear-arm, in combination with a holder adapted to engage successively the heads of the said punches, and also the head of the shank pivotally connected with the said shear-arm, a lever for moving the said holder up and down, and a bar adapted to slide longitudinally, and on which the said lever is fulcrumed, substantially as shown and described.

3. In a punching and shearing machine, a series of different-sized punches, corresponding dies, a shear-block, and a shear-arm, in combination with a holder adapted to engage successively the heads of the said punches, and also the head of the shank pivotally connected with the said shear-arm, a lever for moving said holder up and down, and a bar adapted to slide longitudinally, and on which the said lever is fulcrumed, and a bell-crank lever fulcrumed on the said sliding bar and connected with the long arm of said lever, substantially as shown and described.

4. In a punching and shearing machine, the combination, with a frame provided with standards, of a bar held to slide longitudinally in the said standards, a bell-crank lever fulcrumed on the said bar, a lever pivotally connected with the said bell-crank lever, and also fulcrumed on the said bar, a link connected with the said lever, and a holder held on the said link and adapted to engage the heads of the punches and the shear arm to be operated on, substantially as shown and described.

5. In a punching and shearing machine, the combination, with a frame provided with standards, of a bar held to slide longitudinally in the said standards, a bell-crank lever fulcrumed on the said bar, a lever pivotally connected with the said bell-crank lever, and also fulcrumed on the said bar, a link connected with the said lever, a holder held on the said link and adapted to engage the heads of the punches and the shear-arm to be operated on, and a rack formed on the said bar, a pinion meshing into the said rack, and a crank-arm turning the said pinion, substantially as shown and described.

6. In a punching and shearing machine, the combination, with a frame provided with a longitudinal beam having a series of apertures, of shanks held to slide vertically in the said apertures of the said beams and carrying the punches, a shoulder formed on each of the said shanks, and a spring secured on the said beam

and engaging with its free end the said shoulder so as to hold the said shank in its uppermost position, substantially as shown and described.

5 7. In a punching and shearing machine, the combination, with a frame provided with an apertured longitudinal beam, of a shank held to slide vertically in one of the said apertures, a shear-arm pivotally connected with the said  
10 shank and fulcrumed on the said frame, a shear-block held on the said frame and operating in connection with the said shear-arm, and a spring secured to the said longitudinal beam and engaging with its free end a shoulder  
15 formed on the said shank, substantially as shown and described.

8. In a punching and shearing machine, the combination, with the bar K, a sliding punch-shank, and a holder for engaging said shank,  
20 of the lever H, pivoted to the bar K and having its short arm connected to said holder, the bell-crank lever O, pivoted to the said bar K and having its short arm O' projecting under and resting against the long arm of the lever  
25 H, and the slotted link L, pivoted to the long

arm of the lever H and to the short arm of the bell-crank lever O, substantially as herein shown and described.

9. In a punching and shearing machine, the combination, with a shank having a head and adapted to slide vertically in suitable bearings, of a holder adapted to engage the said head, a link carrying the said holder, a lever pivotally connected at its short end with the said link, a slotted link pivotally held on the  
30 long end of the said lever, a bell-crank lever carrying on one of its arms a bolt engaging the slot of the said slotted link, said arm of the said bell crank lever being also adapted to engage with its curved edge the curved bot-  
35 tom of the long end of the said lever, and a bar adapted to slide longitudinally and carrying the pivots for the said bell-crank lever and the said lever, substantially as shown and ne-  
40 scribed.

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Witnesses:

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VALE P. THIELMAN.