

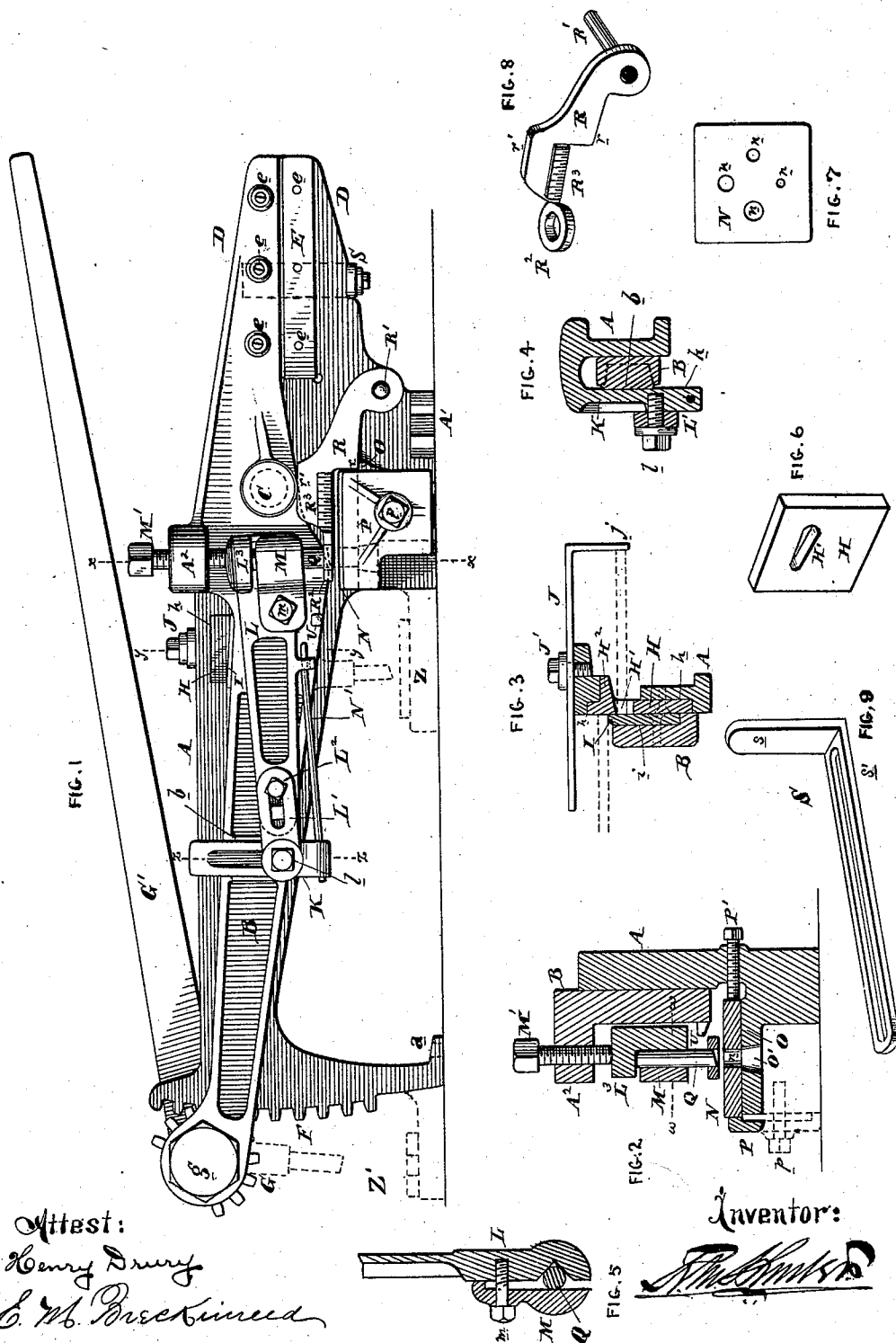
(No Model.)

2 Sheets—Sheet 1.

R. M. HUNTER.
COMBINED SHEARING OR CUTTING TOOL.

No. 570,930.

Patented Nov. 10, 1896.



UNITED STATES PATENT OFFICE.

RUDOLPH M. HUNTER, OF PHILADELPHIA, PENNSYLVANIA.

COMBINED SHEARING OR CUTTING TOOL.

SPECIFICATION forming part of Letters Patent No. 570,930, dated November 10, 1896.

Application filed October 19, 1887. Serial No. 252,775. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH M. HUNTER, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Combined Shearing or Cutting Tools, of which the following is a specification.

My invention has reference to combined shearing or cutting tools; and it consists in certain improvements, all of which are fully set forth in the following specification and shown in the accompanying drawings, which form part thereof.

In carrying out my invention I form a shear with a bar or rod cutter and a punching device, the said bar or rod cutter and punching device being operated by the same power mechanism adapted to operate the shear. The bar or rod cutter and the punching device may be used either together or separately with the shear. The bar or rod cutters are attached, respectively, to the two levers of the shear and fit into recesses thereon, whereby the strain is received by the said levers directly, and screws are not required. These cutters have a tapering orifice to suit different sections of bars or rods to be cut. The punch is held by a pivoted arm which is forced down by an extension from the movable lever of the shear, and such extension is preferably made adjustable. A spring may be used to return the punch to its highest position. The anvil of the punch is formed on the stationary lever or frame of the shear and supports the female die-plate, which is adjustably clamped upon it. A stripper is removably held to the punching apparatus and may be removed when long sheets of metal are to be divided.

The details of construction may be formed in a large variety of ways, the essential feature being the combination, with a lever-shear, of a punching device.

The object of my invention is to form a combination-tool which shall supply the place of three tools and at the same time be compact, durable, and perfect in its action. In practice I have found the tool to be easily operated and capable of doing heavy work in a speedy and perfect manner.

It is sought to devise a machine which shall at the same time be smaller, cheaper, and more efficient than the punchers and cutters heretofore in use. To this end I employ the prin-

ciple of compound leverage, whereby a great degree of power is obtained with economy of space.

The details of my invention will be understood by referring to the drawings, in which—

Figure 1 is a side elevation of my improved machine. Fig. 2 is a sectional elevation through line *xx* of Fig. 1, showing the punching mechanism. Fig. 3 is a sectional view through line *yy* of Fig. 1, showing the bar or rod cutting devices. Fig. 4 is a sectional view through the line *zz* of Fig. 1. Fig. 5 is a sectional plan view of the punch-clamp through the line *ww* of Fig. 2. Fig. 6 is a perspective view of one of the bar-cutting plates. Fig. 7 is a plan view of the detached punching female die-plate. Fig. 8 is a perspective view of the stripper detached from the punching mechanism. Fig. 9 is a perspective view of the gage detached from the machine. Fig. 10 is a side elevation of a modification of my machine. Fig. 11 is a view of a modified gage for the bar or rod cutter. Fig. 12 is a sectional elevation through the line *xx* of Fig. 10, showing the modified bar or rod cutting mechanism. Fig. 13 is a sectional elevation through the line *yy* of Fig. 10, showing the modified punching devices. Fig. 14 is a plan view of the punching-plate through the line *zz* of Fig. 13, and Fig. 15 is an elevation of the rod-cutting plate detached from Fig. 12.

A and B are two levers pivoted together at C. These levers are provided with jaws D and form the shears.

E are cutting-plates secured to the jaws D by the screws *e* to form the cutting edges of the shears.

F is a rack at the other extremity of the lever A. *a* is a foot at the bottom of this rack F. By means of this foot *a* and lugs A' the lever A may be rigidly attached, if desired, to the floor or workbench. To the same end of the lever B is pivoted at *g* the power-lever G', which is provided, at its point of connection with the lever B, with a pinion G, the teeth of which mesh with those of the rack F.

H is the bar-cutting plate and is provided with an opening or hole H' to admit the passage of the rod or bar which is to be clipped or cut. This hole H' is preferably triangular in shape to admit rods of various sizes and in a manner as to hold the larger rods or bars

nearest to the fulcrum C. The plate H is fitted into the recesses *h* of the lever A and is provided with a lug or extension H² to increase the strength of the plate against the upward pressure of the rod while it is being cut or clipped. I is a second or mated bar-cutting plate fitted into the recess *i* of the lever B. These cutting-plates I and H are steel and are snugly pressed together when the levers A and B are drawn together by the bolt C, and they present a hard and polished bearing for the levers A and B to act on at the rear of the fulcrum C.

The shear-blades E are always more or less in contact also, and hence the shear has a good steel bearing on each side of its fulcrum point C, which maintains a good bearing.

J is a slotted gage, one end of which has an extension *j* at an angle. By means of a screw J' this slotted gage J is secured to the lever A and is adjustable to suit the lengths into which it is desired to cut the rod or bar. (See Figs. 3 and 12.)

K is an overhanging extension of the lever A and extends over the lever B, which is fitted snugly between the lever A and its arm extension K and works against said extension K by means of a bearing *b*, which helps to hold the levers together in good operative position.

L is an arm pivoted at *l* to the extension K of the lever A. This arm may, if desired, have an adjustable portion L', made adjustable by means of the screw L², so that the arm may be shortened or lengthened at pleasure.

L³ is the head of the arm L, upon which the screw M' presses, and may have a V-shaped groove for the punch. This screw M' is held by a lug or extension A² on the lever B to the rear of the fulcrum C. M is a clamp which holds the punch Q in this head and is attached to the arm L by the screw *m*. This screw M' might be dispensed with and the lug A² rest directly on the head L³ of the lever L, though I greatly prefer to employ the screw, as it admits of adjustment.

N' is a spring connection between the arm L and overhanging extension K or other part of lever A, which spring throws the arm L up against the screw M'.

N is the female punch-plate and is provided with the holes *n*, which should be of various sizes to suit various punchers. This punch-plate N fits over a shelf extension O of the lever A, preferably to the rear of the fulcrum C, and is adjusted and held in place by the clamp P and the screw P'. The punch-plate N is preferably made square, and when clamped by the screw P' and clamp P it may be adjusted in any direction, so as to bring its hole exactly under the punch Q, so as to make a clean cut. The clamp P is secured to the lever A by a screw *p*.

O' is an opening in the shaft O for the passage of the metal punched after its descent through the hole *n* in the punch-plate.

R is a stripper to free the punch Q from

the sheet metal that has been punched. This stripper, Fig. 8, is composed of the body portion R, stripper-ring R², and measuring-rule R³. The stripper is secured to the lever A by means of the pin R', and its edges *r* and *r'* fit snugly against the edge of the shaft O and hub of the pivot C, Fig. 1, whereby the stripper R is kept firmly in position above the punching-plate. The measuring-rule R³ may be used to measure the distance between the holes which are punched or the distance from the end of the plate to the hole to be punched.

Although I prefer the form of stripper here, described it is evident that any other form may be used in place of it, if desired.

U, Fig. 1, is a lug or pin on the lever B, which in its upward movement will come in contact with the arm L and cause it to rise should the spring N' not be sufficient to draw the punch up to release it from the metal.

S is a gage secured, preferably, to the lower jaw D of the shears. This gage is slotted at *s'*, Fig. 9, and has an arm extension *s*, against which the end or edge of the metal will rest and thus regulate the lengths or widths cut off by the shears.

In operation the lever G' is moved by hand. This will cause the pinion G to descend in the rack F, carrying with it the lever B, putting into operation the punch and rod-cutter and opening the jaws D of the shears. By reversing the operation and raising the rear end of lever B the shears will be closed and the punch raised and bar-cutter opened. To use the shears to cut long strips of metal, the stripper R must be removed to give clearance for the plate fed to the jaws.

In the modification shown in Fig. 10 the operation of the levers is reversed. The rack F is carried by the lever B, while the pinion G is fixed on the pivot or fulcrum *g*. The rotation of this pinion G will cause the rack to descend and put the parts into operation, whereas in the arrangement of the parts shown in Fig. 1 the rack was fixed and pinion G moved upon it. The shape of the opening H' to admit the rod or bar to the cutters may be varied, as is shown in Figs. 10 and 11.

By referring to Fig. 12 it will be seen that in this modification the position of the cutting-plates H and I relatively to each other is reversed, and I is the upper and H the lower cutter.

In Figs. 13 and 14 a circular punch-plate N is shown attached by a central screw N² to the shelf O. This plate is provided with various sizes of holes *n* about its edge, and is free to revolve about the screw N² as a center to bring any desired hole under the punch Q. On the rim of this circular die-plate are a series of indentations or notches *t*, into which a spring-catch T on the lever A is snapped to hold the die-plate in the desired position under the punch Q.

It will be observed that in the construction shown in Figs. 10 to 14 the punch Q is held

in the lug A² on the lever B and the lever L is dispensed with. It is also self-evident that while I have shown the punch to be to one side of the levers and near to the fulcrum it is equally possible to locate said punching devices farther back, as indicated in dotted lines at Z or Z', as the essential feature simply requires that the punch shall be operated by the same mechanism which operates the shears.

These details of construction here shown and described are those which have suggested themselves as the most practical and efficient for my invention; but they may be varied in many ways without departing from its principles, and are not to be considered limitations of it.

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

1. In a shears the combination of a stationary frame A having a rack F at one end and a shear-blade E on its other end and a shelf O on one side and to the rear of the shear-blade, the pivoted lever B having a shear-blade corresponding to the blade E and fulcrumed to the frame A immediately to the rear of the shear-blades and also provided with a projection A² having a screw M' somewhat to the rear of the fulcrum, a hand-lever G' journaled at the rear end of the lever B and having a pinion G meshing with the rack F, a rectangular punch-plate N resting upon the shelf, a punch Q, a pivoted holder for said punch arranged under the screw M', and a clamp P and screw p to hold the punch-plate in position upon the shelf in proper adjustment under the punch.

2. A metal-cutting tool or shear consisting of the combination of a stationary frame A and a lever B fulcrumed thereto, shear-blades E secured to said parts A and B on one side of the pivot or fulcrum and forming a bearing between the two parts, the shear-blades of a bar or rod cutter arranged upon the opposite side of the pivot or fulcrum, and a punching mechanism located to one side of the plane of the bearings formed by the several shear-blades and at a point intermediate of them and consisting of a punch-plate or female die held by the frame A and the punch or male die Q operated by the other or lever B, and power devices to cause the lever B to have a movement upon the frame A simultaneously operating the bar-cutter, shear and punching mechanism.

3. In a shears the combination of the frame A, a lever B pivoted thereto, power-applying mechanism consisting of a rack carried upon the frame and a lever and pinion meshing with the rack and pivoted upon the lever B, with a punching device consisting of a die-plate N and a punch Q arranged upon said parts A and B between the fulcrum or pivot thereof and power-applying mechanism and in which the punch is operated by the lever B and the punch-plate is carried by the frame A, and bar-cutting shear-blades H and I se-

cured respectively to the parts A and B and arranged between the fulcrum or pivot and the power-applying mechanism.

4. The combination of a frame A, a lever B pivoted to the frame at C, a cutter-blade H secured to the frame and having an opening H' of greater height at its end next to the fulcrum C than at the other end, a cutter or blade I working in contact with the plate H and secured to the lever B, and a guide R for the bar or rod to be cut carried by one of said parts H and B.

5. The combination of a frame A, a lever B pivoted to the frame at C, a cutter-blade H secured to the frame and having an opening H' of greater height at its end next to the fulcrum C than at the other end, a cutter or blade I working in contact with the plate H and secured to the lever B, a guide R for the bar or rod to be cut carried by one of said parts H and B, and shear-blades E, E secured respectively to the frame A and lever B so as to work in contact with each other upon the side of the fulcrum or pivot C farthest from the plate H and blade I whereby there are bearings upon each side of the pivot for the movable lever B.

6. The combination of a frame A, a lever B pivoted to said frame A, shear-blades E, E respectively secured to the free ends of the parts A and B, a smooth bearing-face b upon the side of the lever B of its long arm and directed away from the frame A, and an overhanging guide-arm K from the frame A having a smooth guide-face k against which the smooth face b of lever B works.

7. The combination of the frame A, the lever B pivoted to the frame at C, shear-blades upon the free ends of said frame and lever, a shelf or table O secured to the frame to the rear of the blades E and to one side of the said frame, a removable punch-plate N adjustably secured to said shelf, a punch Q for said plate operated by the lever B, and a removable stripper R for the punch carried by the frame A.

8. The combination of a frame A, a lever B pivoted to the frame, a shelf projecting laterally from the frame, a rectangular punch-plate N fitted to the shelf and adjustable in all directions thereupon, a clamp P secured to said shelf or its frame to clamp the plate in position, an adjusting-screw p carried by the frame to limit the lateral adjustment of the punch-plate, and a movable punch Q operated by the lever B.

9. The combination of a frame A, a lever B pivoted to the frame, a shelf projecting laterally from the frame, a rectangular punch-plate N fitted to the shelf and adjustable in all directions thereupon, a clamp P secured to said shelf or its frame to clamp the plate in position, an adjusting-screw p carried by the frame to limit the lateral adjustment of the punch-plate, a movable punch Q operated by the lever B, and a removable strip-

per R arranged above the punch-plate and carried upon the frame therefor.

10. The combination of a frame A, a lever B pivoted to the frame, a shelf projecting laterally from the frame, a rectangular punch-plate N fitted to the shelf and adjustable in all directions thereupon, a clamp P secured to said shelf or its frame to clamp the plate in position, an adjusting-screw *p* carried by the frame to limit the lateral adjustment of the punch-plate, a movable punch Q operated by the lever B, a pivoted arm pivoted to the stationary frame A and provided with a clamp at its free end for detachably holding the punch, and a laterally-projecting part movable with the lever B to directly operate upon the pivoted arm.

11. The combination of the frame A, the lever B pivoted thereto at C, a punch-plate N secured to the frame, an arm L pivoted to the frame at a point above the punch-plate and having a punch-holder M, a punch Q carried by said holder, a projecting part of the lever B above the arm L to depress it, and a projection U upon the lever B below the arm L to raise it positively.

12. The combination of the frame A, a lever B pivoted to the frame A at C, a punch-plate N secured to the frame, an arm L pivoted to the frame and provided with a punch-holder M, a punch for said holder, a projection A² extending laterally from the lever, a screw M' carried by said projection and directly operating upon the arm L to force the punch toward the punch-plate, and a spring N to force said arm L away from the punch-plate.

13. The combination of the frame A, the lever B pivoted thereto at C, a punch-plate N secured to the frame, an arm L pivoted to the frame at a point above the punch-plate and having a punch-holder M, a punch Q carried by said holder, a projecting part of the lever B above the arm L to depress it, a projection U upon the lever B below the arm L to raise it positively, and a spring to force the arm L away from the punch-plate.

14. The combination of a frame A, a lever B pivoted to the frame A, a punch-plate secured to the frame A below the lever B, a punch-carrying arm pivoted to the frame A at the rear of the pivot-point of the lever B, a punch carried by the said arm working in connection with the punch-plate, and an adjustable pressure-screw M' carried by the lever B to the rear of the pivot adapted to press upon the punch-carrying arm.

15. The combination of a frame A, a lever B pivoted to the frame A, a punch-plate secured to the frame A below the lever B, a punch-carrying arm pivoted to the frame A at the rear of the pivot-point of the lever B, a punch carried by the said arm working in connection with the punch-plate, an adjustable pressure-screw M' carried by the lever B to the rear of the pivot adapted to press upon the punch-

carrying arm, and a spring to force said arm up against the screw.

16. The combination of a frame A, a lever B pivoted to the frame A, a punch-plate secured to the frame A below the lever B, an extensible punch-carrying arm pivoted to the frame A at the rear of the pivot-point of the lever B, a punch carried by the said arm working in connection with the punch-plate, and an adjustable pressure-screw M' carried by the lever B to the rear of the pivot adapted to press upon the punch-carrying arm.

17. The combination of a frame A, a lever B pivoted to the frame A, shear-blades E, E respectively secured to the free ends of the frame A and lever B, a laterally-projecting shelf or table O extending from the frame A at a lower level than the lever B, an adjustable punch-plate N secured to said shelf, a punch Q for said plate supported independently of but movable by the lever B, and a stripper R for the punch held by the frame A and maintained in position between the shelf and pivot of the lever B and forming a clearance above the punch-plate.

18. The combination of a frame A, a lever B pivoted to the frame A, shear-blades E, E respectively secured to the free ends of the frame A and lever B, a laterally-projecting shelf or table O extending from the frame A at a lower level than the lever B, an adjustable punch-plate N secured to said shelf, a punch Q for said plate supported independently of but movable by the lever B, and a stripper R having a vertical face provided with a scale arranged longitudinally or parallel to the lever for the punch held by the frame A and maintained in position between the shelf and pivot of the lever B and forming a clearance above the punch-plate.

19. The combination of a frame A having a base or support for attachment to the table or floor and a stationary rack-segment F at its rear end, a lever B pivoted to the frame A at C, shear-blades secured to the free ends of the frame A and lever B, a hand-lever G' having a pinion G pivoted to the rear end of the lever B and adapted to mesh with the rack F of the frame A whereby the pinion and hand-lever rise and fall with the movable lever B.

20. The combination of a frame A having a base or support for attachment to the table or floor and a stationary rack-segment F at its rear end, a lever B pivoted to the frame A at C, shear-blades secured to the free ends of the frame A and lever B, a hand-lever G' having a pinion G pivoted to the rear end of the lever B and adapted to mesh with the rack F of the frame A whereby the pinion and hand-lever rise and fall with the movable lever B, a punch-plate N secured to one side of the frame A, a vertically-movable punch Q, and an arm carrying the punch pivoted to the frame A and operated by the lever B.

21. The combination of a stationary frame, 130

a lever pivoted thereto, a punch-plate secured to the frame, an arm pivoted to the frame and provided with punch-holders consisting of a head L^3 having a V-shaped groove and a clamp
5 M and clamping-screws m , and a projection from the lever to press upon said arm to force the punch toward the punch-plate.

In testimony of which invention I hereunto set my hand.

RUDOLPH M. HUNTER.

Witnesses:

E. M. BRECKINREED,
RICH'D. S. CHILD, Jr.