

(No Model.)

F. SEARLE.

METHOD OF AND MACHINE FOR PRODUCING V-WELDED CUTTER STOCK.

No. 442,550.

Patented Dec. 9, 1890.

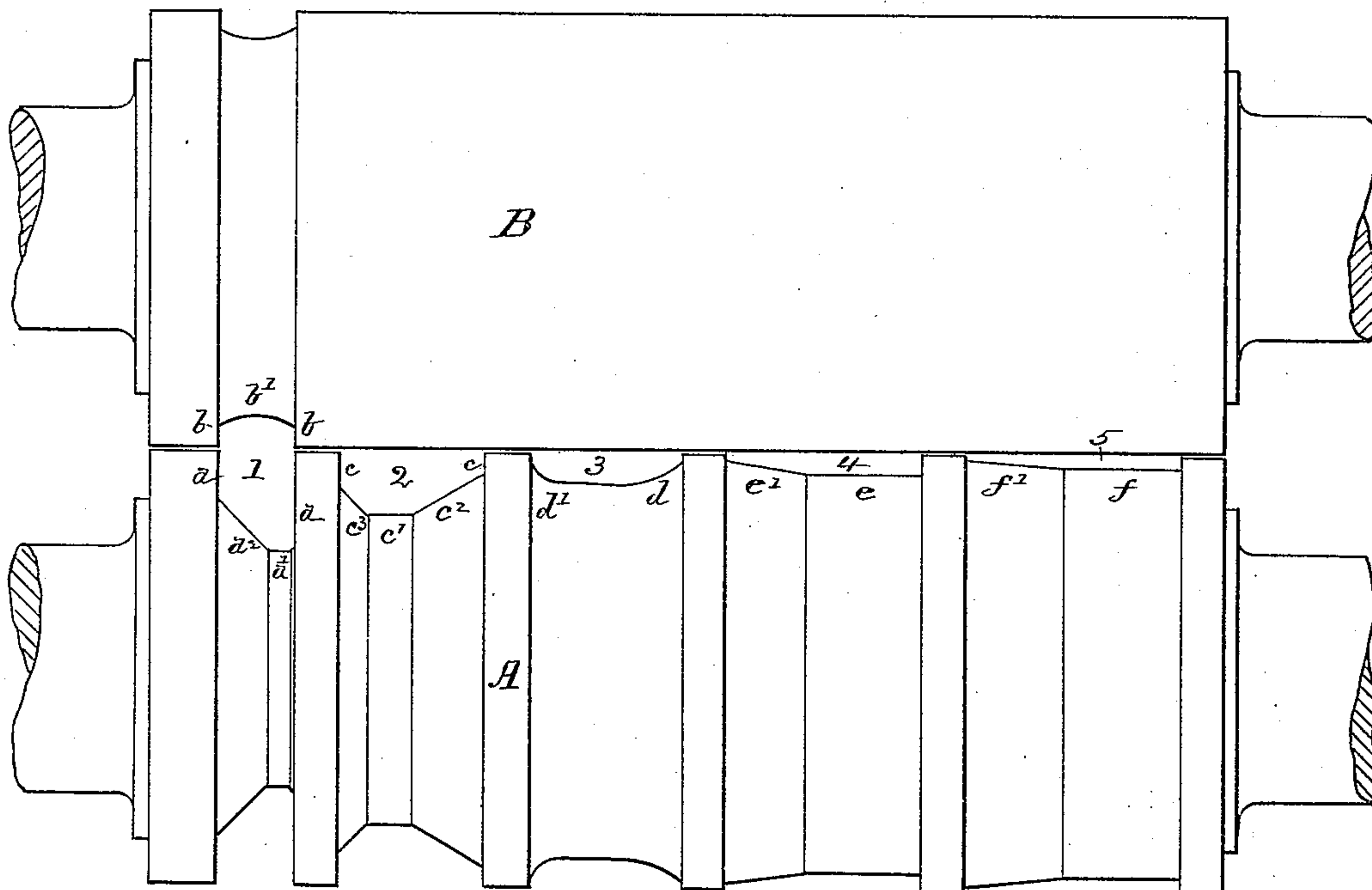


Fig. 1.

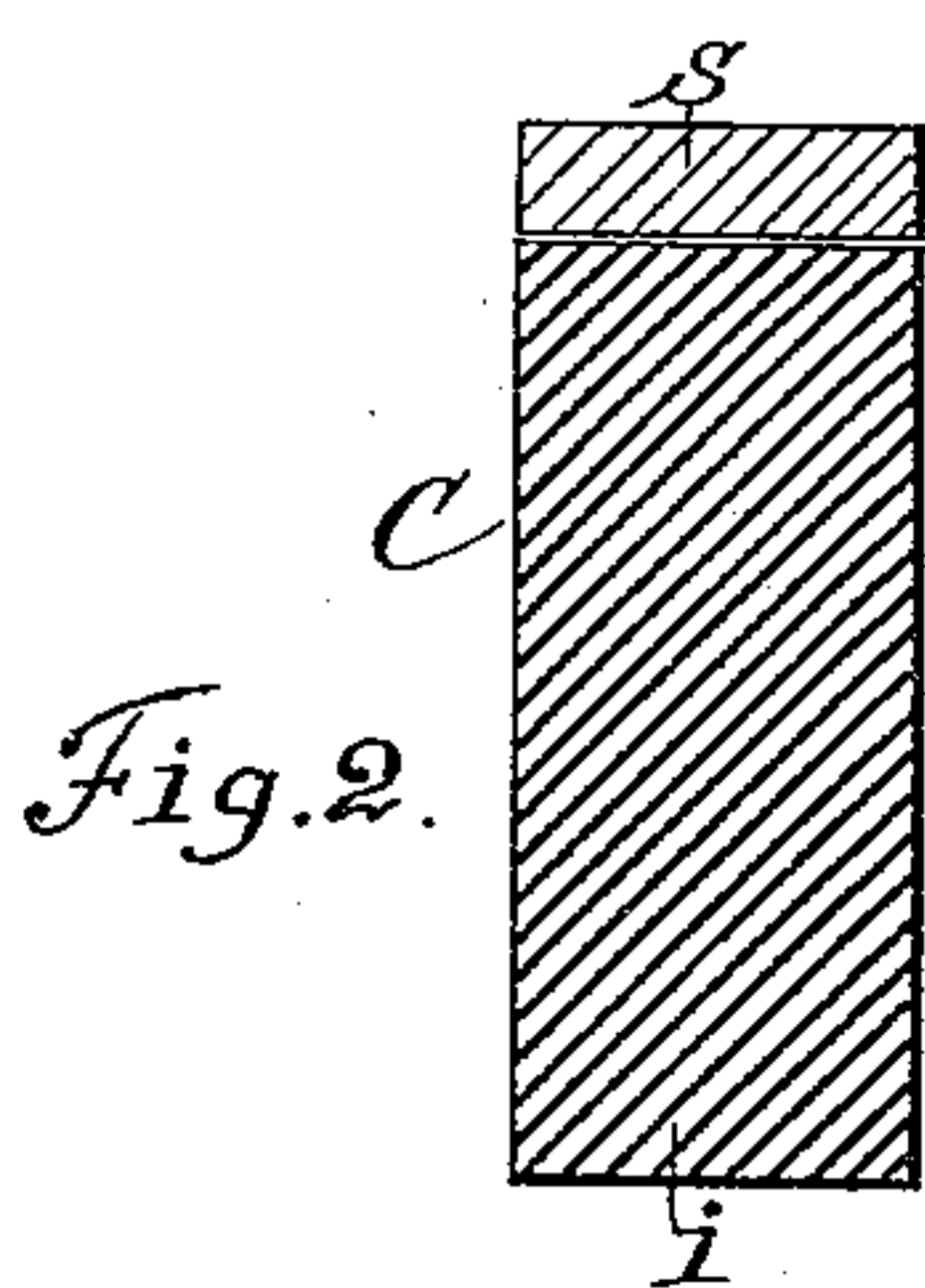


Fig. 2.

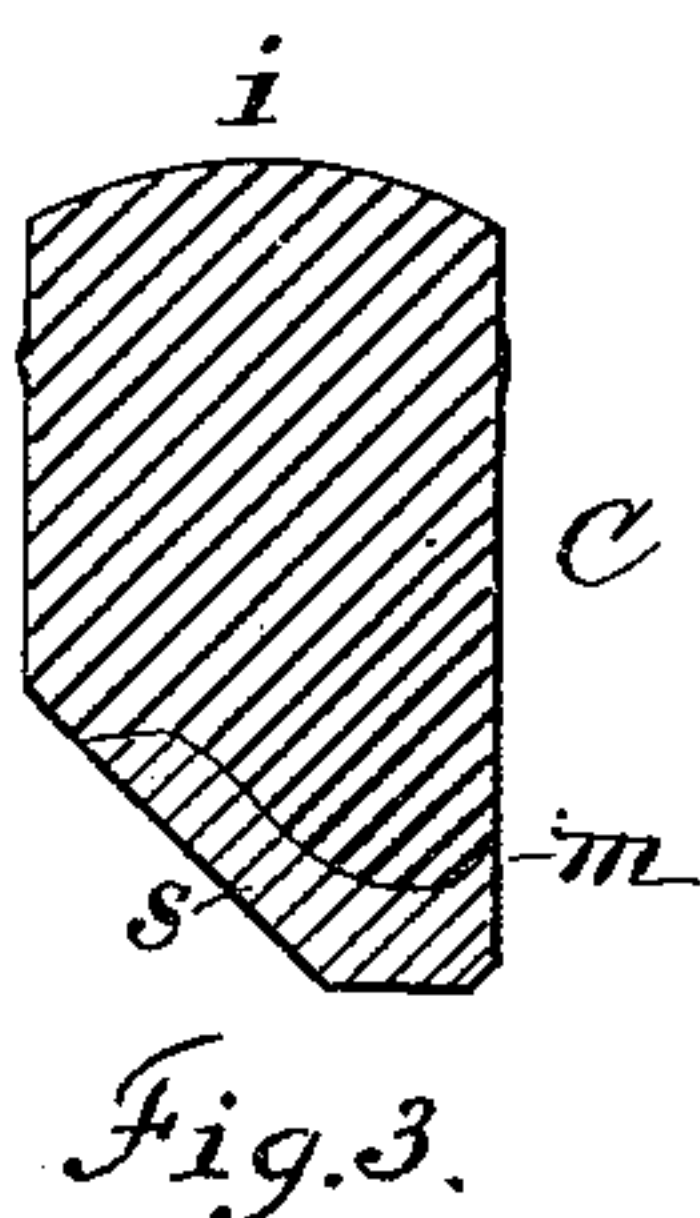


Fig. 3.

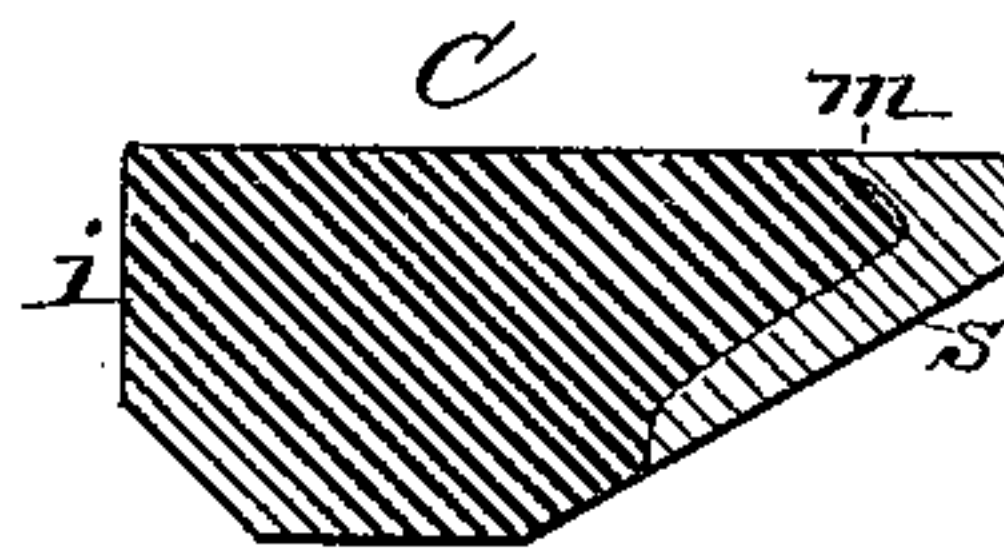


Fig. 4.

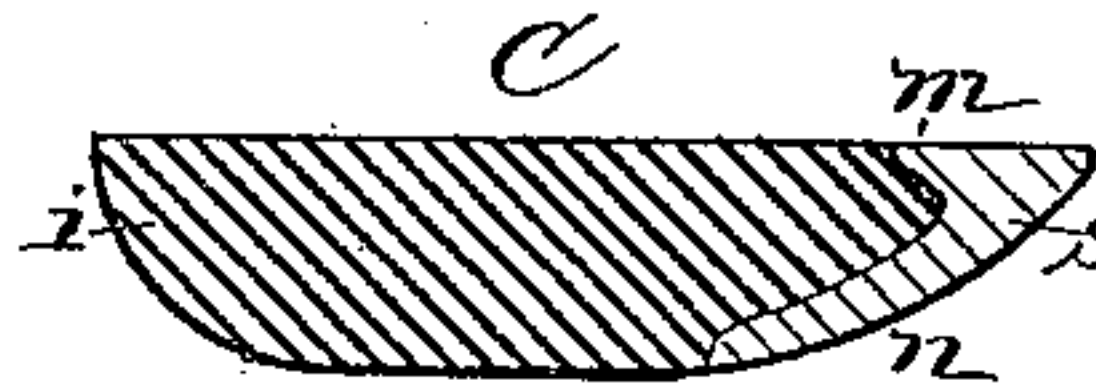


Fig. 5.



Fig. 6.

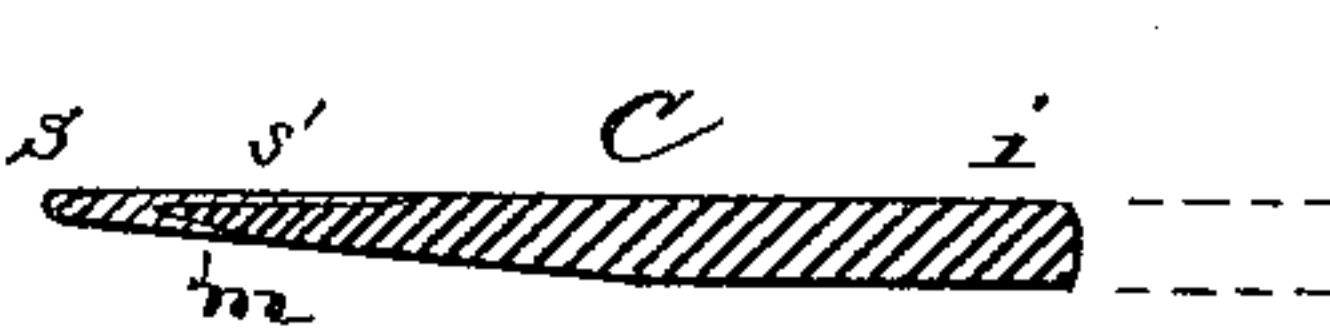


Fig. 7.

Witnesses

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Fig. 8.

UNITED STATES PATENT OFFICE.

FREDERICK SEARLE, OF WORCESTER, MASSACHUSETTS.

METHOD OF AND MACHINE FOR PRODUCING V-WELDED CUTTER-STOCK.

SPECIFICATION forming part of Letters Patent No. 442,550, dated December 9, 1890.

Application filed September 13, 1890. Serial No. 364,913. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK SEARLE, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Method and Means of Producing V-Welded Cutter-Stock, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

The object of my present invention is to afford a method and means for the practical and successful production by rolling operation of cutter-stock having the oppositely-lapped or V-shaped weld of the steel edge upon the iron body.

My invention consists in the peculiar rolls for giving the initial form to the billet, whereby the steel edge is caused to assume a shape that subsequently develops by the several rolling passes into the desired V-shaped weld; also, in the manner of manipulating and reducing the stock by rolling operation in rolls having a series of passes which impart to the component masses of the billet sectional form at the respective stages of reduction and finish, such as herein illustrated and described.

In the drawings, Figure 1 is a front view of a pair of rolls having passes or die-grooves according to my invention. Fig. 2 is a section showing the form of the iron and steel bars before welding them. Fig. 3 is a section of the compound billet after its run through the initial pass of the rolls. Figs. 4, 5, 6, and 7 are sections of the welded stock at various stages of reduction corresponding to the several subsequent passes of the rolls, and Fig. 8 is a diagram showing the V form of the steel edge after the stock has been ground or sharpened to a cutting-edge.

Referring to the drawings, A and B indicate the reducing-rolls, which may be, say, eight inches (more or less) diameter and of any required length, said rolls being provided with suitable bearings and connecting ends, to be mounted and rotated in the usual well-known manner in connection with housings and gearing such as heretofore employed in rolling-mills.

C indicates the billet or bar of stock, composed of the iron *i* and steel *s*. The initial pass 1 of the rolls is formed to receive the bar C edgewise, with a deep groove in one roll, formed with straight sides at *a*, a flat bottom *a'*, and a long incline *a''*, joining one side and the bottom, as shown, while the opposite roll has a shallow groove with straight sides at *b* and a rounded head, as at *b'*. The second pass 2 is made to take the bar flatwise. The groove in roll A has a straight side *c*, a long diagonal *c''*, flat bottom *c'*, and a short diagonal *c'''*. The next pass 3 has a long circular end *d* and a short circular end *d'*. The next pass 4 has a flat bottom *e*, with incline *e'*, approximating to the finished form of the stock, and the final pass 5 has a flat bottom *f* and bevel-incline *f'*, and is of the required finished size for the cutter-stock. The roll B is preferably made plain for the several passes 2, 3, 4, and 5.

The bar of iron *i* and steel *s* are laid together and heated to the proper welding heat, then taken from the furnace, and with one stroke of a hammer or drop on the top edge are stuck together in the form shown in Fig. 2. The bar is then inverted, steel downward, and run through pass 1 of the rolls, which imparts to the metals the shape indicated by Fig. 3, carrying the steel over the edge with a slight lip, as at *m*. The bar is then run through pass 2 flatwise, and the lip of steel at *m* is thereby thrown farther over the iron, giving the form substantially as in Fig. 4. The bar is then run through the rounded pass 3, which gives the sectional form, as in Fig. 5, the long curve at *d* tending to carry the steel still more toward the edge by pressing it downward, as at *n*, and also to increase the lip *m*. The bar is then inverted and run through the pass 4, which forces back and flattens the steel, giving the V shape to the welded line, so that the steel embraces the edge *i'* of the iron between its outside lip *m* and the inside flange *s'*, as shown in Fig. 6. The bar is then run through pass 5 to give the finished size required, (see Fig. 7,) the general shape not being materially changed thereby.

This stock, when made into cutters and ground to a sharp edge, as at *x*, Fig. 8, affords an upwardly-extending lip of steel over the edge of the iron, as shown at *m'*, Fig. 8, so

that the fiber of stock will not wedge into any chance flaw in the line of weld and cause the thin edge of the iron to roll up and create roughness.

5 Cutter-stock having a V-shaped weld has heretofore been made by hammering operation; but so far as I am aware no process or means has heretofore been devised whereby such V-shaped welded cutter-stock could be
10 produced by rolling operation, and persons familiar with the practice of making cutter-stock will readily see the importance and practical utility of my improvements in production of this class of cutter-stock, the advantages being that by this means I produce
15 a stock of better form, more thorough and even weld, and of more uniform quality and texture than has heretofore been done, while giving an overlapping or V-shaped weld, the edges of which are substantially of the same
20 dimension throughout the length of the bar, so that they expose a true and even surface when the stock is ground after being formed into cutters.

25 I claim as my invention herein, to be secured by Letters Patent—

1. The improvement in the method of making cutter-stock with V-shaped weld, which consists in the initial reduction of the compound rectangular bar by means of rolls hav-

ing a die, groove, or pass, wherein the steel is welded to the iron in the form of an inclined edge, with a backwardly-turned lip *m* opposite the incline, and the extension and development of said lip by subsequent rolling
35 operation in grooves or roll-passes such as described.

2. A pair of rolls for the manufacture of cutter-stock with overlapping V-shaped weld, having the pass 1 for the initial welding of
40 the stock formed substantially as specified, whereby the inwardly-turned lip *m* is imparted to the steel edging, as and for the purposes set forth.

3. The within-described rolls for the manufacture of cutter-stock with overlapping V-shaped weld, having the pass 1 for the initial
45 welding reduction and the series of following passes 2, 3, 4, and 5 respectively formed substantially as shown, for imparting to the steel
50 the inwardly-turned lip *m*, and at the successive reductions developing the same into the V-shaped overlap in the finished stock, substantially as set forth.

Witness my hand this 8th day of September, A. D. 1890. 55

FREDERICK SEARLE.

Witnesses:

CHAS. H. BURLEIGH,
ELLA P. BLENUS.