H. D. Cowles.

Manufacture of Horseshoe Nails.

No. 71710

Patented Dec. 3, 1867.

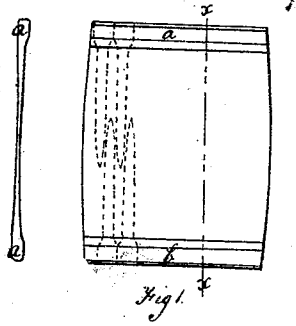


Fig. 1.

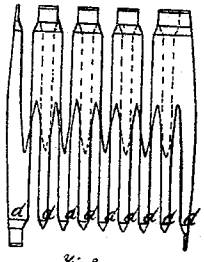


Fig. 3.

Fig. 4.

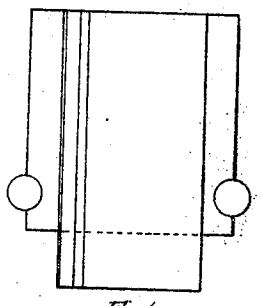


Fig. 6.

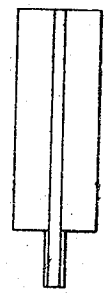
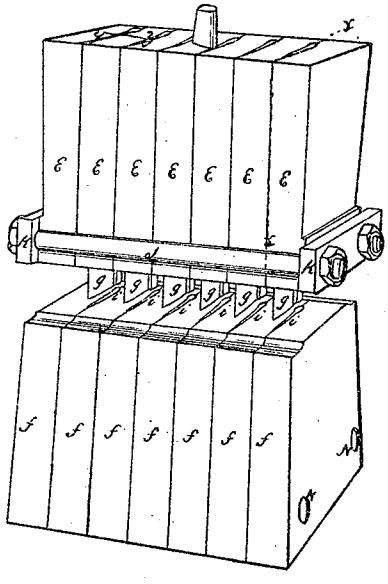


Fig. 7.

Fig. 5



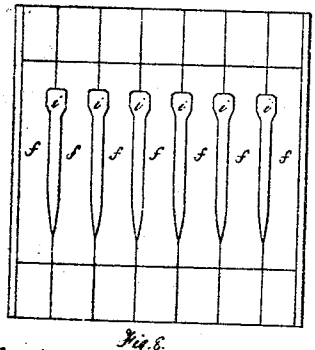


Fig. 8.

Witnesses
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Fig. 11.

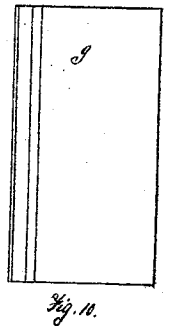

Fig. 10.

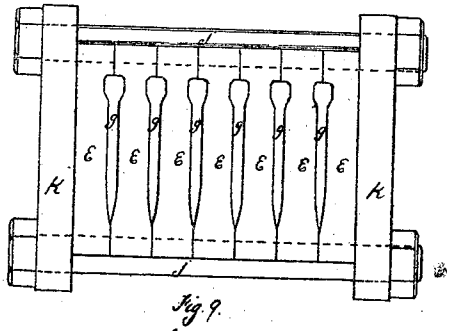

Fig. 9.

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UNITED STATES PATENT OFFICE.

HARLEY D. COWLES, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE BRIDGEPORT HORSESHOE NAIL COMPANY.

IMPROVEMENT IN MANUFACTURE OF HORSESHOE-NAILS.

Specification forming part of Letters Patent No. **71,710**, dated December 3, 1867.

To all whom it may concern:

Be it known that I, HARLEY D. COWLES, of the town of Bridgeport, county of Fairfield, and State of Connecticut, have invented a new and useful Improvement in the Manufacture of Horseshoe-Nails; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in giving to iron plates out of which horseshoe-nails are to be punched a peculiar shape, for the purpose of saving the raw material and giving proper form to the nails, and in so constructing the punches and dies by which the said nails are produced that the expense of constructing and keeping them in repair may be materially reduced.

In the accompanying drawings, Figure 1 represents a view of the upper surface of an iron plate formed in the shape adopted by me for being manufactured into horseshoe-nails. Fig. 2 represents a sectional view of said plate through the line *x x* of Fig. 1. Fig. 3 represents the skeleton of said plate after the nails have been punched out. Fig. 4 represents the nail itself. Fig. 5 represents a perspective view of the punch and dies used by me in producing the nails from the said plates. Fig. 6 represents a sectional view of the punch through the line *x x* of Fig. 5. Fig. 7 represents a sectional view of a portion of the punch through the line *y y* of Fig. 5. Fig. 8 represents the top of dies. Fig. 9 represents the cutting ends of the punches. Figs. 10 and 11 represent, respectively, the side and end views of the cutting parts of the dies.

The same letters refer to the same parts in the several figures.

It will be observed that the plate, as shown in Figs. 1 and 2, is so formed that the two opposite edges *a* and *b* are of suitable shape and thickness to form the heads of the horseshoe-nails when the same are punched out, and that the plate gradually diminishes in thickness toward the center thereof. This plate is formed from ordinary plate-iron, of suitable width and thickness, by being passed hot through rolls, the rolls being so constructed that the passage of the plate through them will have the edges *a* and *b* raised, as shown. The plate, in passing through the rolls, is rolled in a line with the grain of the iron, so that the plate will not spread sidewise. These plates are generally rolled singly; but by having rolls properly constructed, several of said plates may be rolled in one bar or sheet, and then be cut apart.

The process of forming iron sheets or plates of various forms by passing them through rolls is so well understood by mechanics that any further description is unnecessary. These plates, however, may be formed into the desired shape by swaging instead of rolling. After the plate is formed, as shown, the nails are cut or punched out, as shown by the dotted lines in Figs. 1 and 3, the grain of the iron being in all cases lengthwise of the nail. After the punching is completed the skeleton of the plate on both sides is left in the form shown at *d d d d* in Fig. 3. It will be observed in Fig. 3 that the point of each nail extends about half an inch beyond the center and thinnest part of the plate, which is an important advantage. It is very desirable that the point of the nail should be a little thicker than it is a little back of the point, and as the plate is the thinnest in the center, the projection of the nail beyond the center gives the desired form.

The punches and dies which I use in manufacturing the nails from the above-described plates differ from those heretofore used for similar purposes. The cutters *g g g g g g*, Fig. 5, are of the form and shape shown in Figs. 10 and 11, and are firmly secured in their proper position in the press by means of the steel blocks or sections *e e e e e e*, the bolts *j j*, and clamps *k k*. Between the steel sections *e e e e e e* are grooves corresponding with the shape of the cutters or punches, into which said cutters are placed. Should one of the cutters be broken or become dull, by loosening the nuts to the bolts *j j* said cutter can be removed, repaired, and returned to its proper place without interfering with the other cutters. If any one of the cutters or punches should be broken it can be taken out, ground down, and put back in its place. Should the cutter then repaired be too short to reach to the top sur-

face of the steel sections or blocks, the intermediate space can be filled up with iron or steel plugs to prevent said cutter or punch from being driven upward. The dies are constructed in a similar manner, consisting merely of steel sections, with grooves so formed that when said sections are secured together by means of the bolts and screws *n n* the spaces or openings *i i i i i*, corresponding with the shape of the nails, will be left extending through from the top to the bottom of the dies.

Punches and dies thus constructed can be made and kept in repair much more expeditiously and cheaply than those formed in the usual manner. Punches and dies are usually constructed out of solid blocks or pieces of steel, so that if any portion of the operating part of the punch or die becomes broken the entire punch or die is destroyed, or must be laid aside for repairs. As these punches and dies are very expensive, it will readily be observed that the use of my sectional punch and die would be a great saving of time and expense.

Having thus described my invention, what I claim therein as new, and desire to secure by Letters Patent of the United States, is—

1. The compound cutting apparatus consisting of the series of dies and the series of cutters, constructed substantially as herein described.

2. The method herein set forth of making nails for horseshoes—namely, by first rolling the plate to the form described, and represented by Figs. 1 and 2, and then cutting the nails therefrom by means of the series of dies and series of cutters, secured or formed in sectional holders, all as herein described.

HARLEY D. COWLES.

Witnesses:
GEO. F. HUMISTER,
W. S. BULL.