

(No Model.)

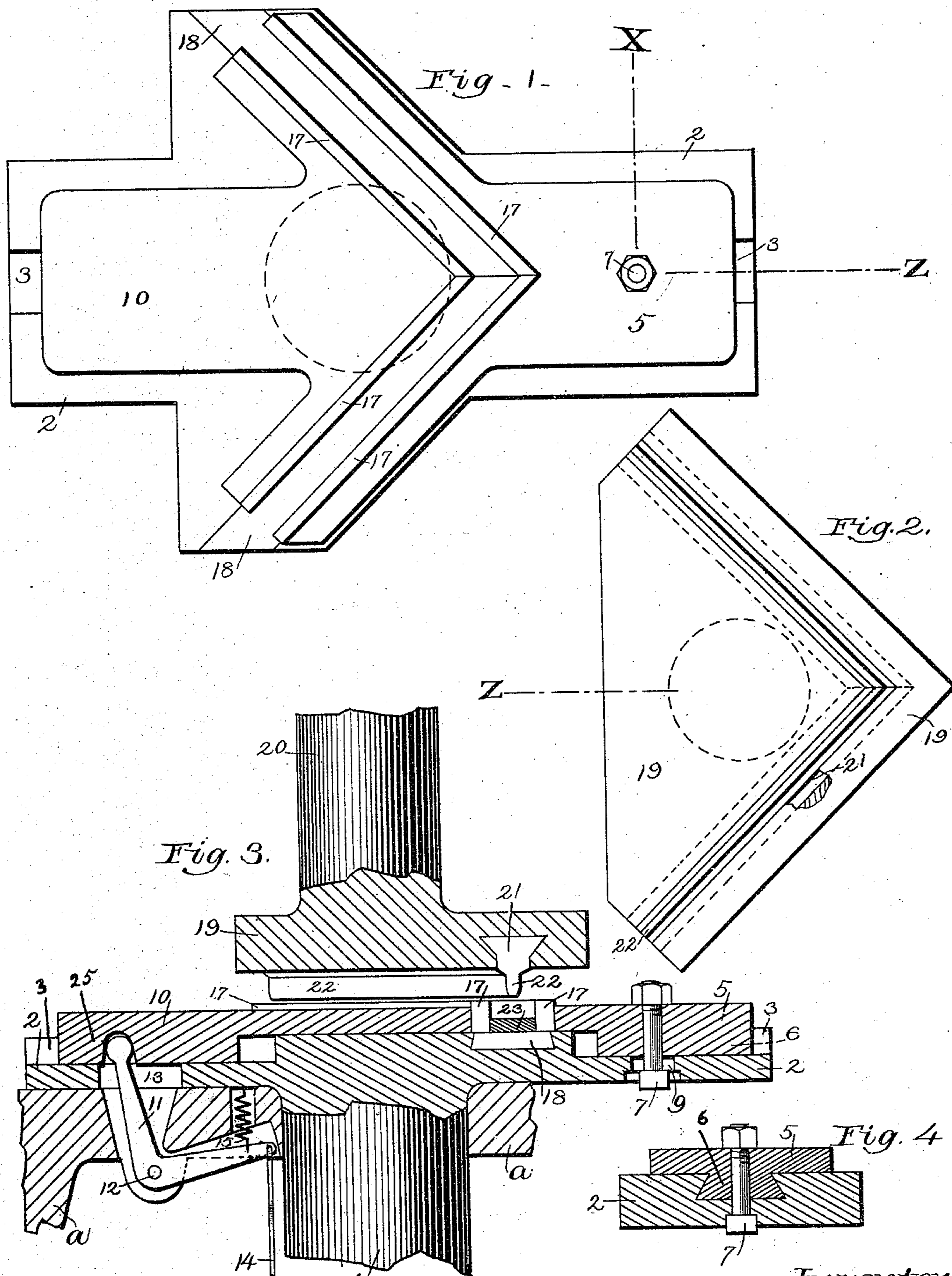
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E. C. PORTER.

PROCESS OF AND APPARATUS FOR MANUFACTURING CARRIAGE
CORNER IRONS.

No. 412,663.

Patented Oct. 8, 1889.



Witnesses

C. B. Atwood

Eugene Humphrey

Inventor

Edward C. Porter
per J. W. Porter, his Atty

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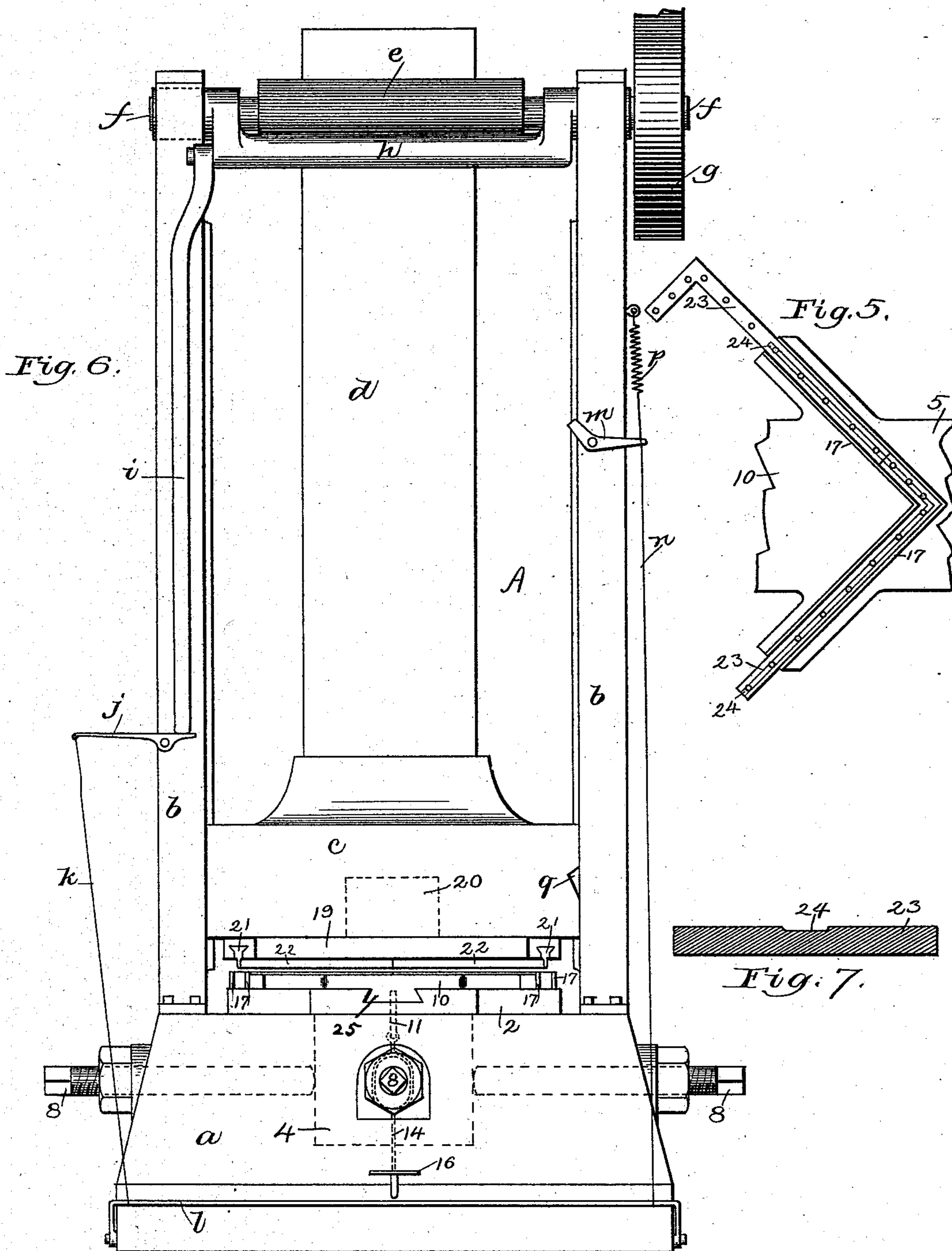
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UNITED STATES PATENT OFFICE.

EDWARD C. PORTER, OF NEW HAVEN, CONNECTICUT.

PROCESS OF AND APPARATUS FOR MANUFACTURING CARRIAGE CORNER-IRONS.

SPECIFICATION forming part of Letters Patent No. 412,663, dated October 8, 1889.

Application filed May 18, 1889. Serial No. 311,285. (No model.)

To all whom it may concern:

Be it known that I, EDWARD C. PORTER, of New Haven, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in the Process of and Apparatus for Manufacturing Carriage Corner-Irons, which will, in connection with the accompanying drawings, be hereinafter fully described, and specifically defined in the appended claims.

In said drawings, Figure 1 is a top plan view of the bed and lower fixtures which I employ in carrying my invention into practice. Fig. 2 is an inverted or under side plan view of the upper fixture and dies which I also employ. Fig. 3 is a vertical section taken on line Z, Figs. 1 and 2, the parts being shown in Fig. 3 as arranged to coact when in use. Fig. 4 is a vertical section taken on line X, Fig. 1, through the bed and the back lower fixture. Fig. 5 is a plan view showing my method of arranging the corner-irons in the dies for straightening. Fig. 6 shows a drop-press in front elevation, with the bed, fixtures, and dies thereon arranged as a practical means for putting them to use. Fig. 7 is an enlarged end view of one of the arms of the corner-iron, showing a longitudinal depression therein after being straightened.

This invention relates to the manufacture of "corner-irons," so called, that are secured to the top edge of carriage-bodies at the corners thereof; and it consists in the means and method hereinafter described and claimed.

This class of irons are cut by cutting-dies in cutting-presses from sheet metal—such as iron or low steel—and in cutting each corner-iron the edge of the next one is formed, the irons being from one-fourth to one-half an inch in width, and as the reciprocating cutting-die extends over the sheet metal but the width of the corner-iron that is being cut therefore the shearing action of the dies tends inevitably to crook each iron both edgewise and sidewise, and also to impart to it a spiral twist, to a greater or less extent, as also to throw it out of a true square, or so that its two arms are not at right angles with each other; and as these corner-irons must, to be in practical condition for use, be perfectly true in plane and must have their edges per-

fectly straight, and as such straightening and truing are always performed by hand—that is, they are hammered with a hand-hammer upon an anvil to bring them thus true—therefore it results that the straightening is much the largest item of any involved in their manufacture; and the object of my invention is to provide a method and means whereby these irons may be forced into a straight form edgewise and also exactly square, and while so held may have the arrangement of their formation or particles so changed by the force of a heavy blow delivered by a die having an edge of less width than the corner-iron, whereby the irons will remain straight, true, and square when released from the clamping devices in which they were held when so struck by the striking-die.

The best means known to me of carrying my said invention into effect is shown in the accompanying drawings, in which—

A represents a drop-press, which consists, essentially, of base or bed *a*, the ways *b*, mounted upon and secured to A, the drop or hammer *c*, interlocked and sliding in ways *b*, the elevating strap or bar *d*, secured to *c* and extended between the friction driving-rolls *e*, driven through pulley *g*, mounted on the shaft *f* and actuated by rod *i* to force said rolls toward each other and against said strap, lever *j*, pivoted to way *b* to actuate rod *i*, and itself actuated by cord *k*, secured to treadle-bar *l*, and a detent *m*, also pivoted to way *b* and arranged to hold drop *c* raised by engaging in seat *q* therein, said detent being tripped from said seat by treadle *l* through cord *n*, and re-engaged by spring *p*, all said parts and their mode of operation being so common and well known that a further description thereof is unnecessary.

As the means for holding the corner-irons in position while being struck and straightened, I secure a bed 2, of suitable size, form, and strength, upon base *a* of press A, a dovetail groove 3 being formed through bed 2 from front to rear, as shown in Figs. 1, 3, 4, and 7, and a stud 4, formed upon its under side, serves as the means of adjusting its position on base *a*, in which latter are threaded the adjusting-screws 8, Fig. 6, which bear against said stud, and thereby adjust and

hold the bed 2 in position. A back fixture 5, Figs. 1 and 3, is adjustably secured on bed 2 by its dovetail 6, fitting in groove 3, and the locking-bolt 7, which passes through slot 9 in bed 2, as shown in Fig. 3. A front fixture 10 is also arranged on bed 2, and is held in position by its dovetail 25, fitted in groove 3, as shown in Figs. 3 and 6. This fixture is moved toward the back fixture through angle-lever 11, pivoted at 12 in base *a*, and having its upper arm extended up through slot 13 in bed 2 and engaging said fixture, as shown in Fig. 3, said lever 11 being actuated in one direction through rod 14, attached at its upper end to said lever and at its lower end to treadle 16, pivoted in base *a*, so as to be depressed by the foot of the operator, a spring 15 being arranged to raise said treadle, and thereby actuate lever 11, and thus move the fixture forward when the treadle is released. The opposing faces of the fixtures 5 and 10 are faced with bars of steel 17, duly hardened or tempered, and secured to the fixtures by screws, so as to be replaced when worn or injured, these plates on each fixture being arranged at exactly ninety degrees to each other, so that when the corner-iron is clamped therein it shall be exactly square. Said plates 17 are herein termed the "clamping-dies," as they perform the function of dies when the corner-iron is clamped between them, and plates of steel 18, also tempered or hardened, are secured in bed 2 to extend across the open space between bars 17 on fixtures 5 and 10. A top fixture 19, having a stud or stem 20, is by said stud secured in drop *c* of press A. In said top fixture the bars 21, of tempered or hardened steel, are secured in dovetail slots, as shown in Figs. 3 and 6, the projecting portion of said bars terminating at the bottom 22 in a blunt form, having corners preferably slightly rounded in cross-section, said bars 21 being hereinafter termed the "striking-dies."

My invention is carried into practical effect in the following described manner: The back fixture 2 being properly positioned and secured by its bolt 7, and drop *c*, having top fixture 19 duly positioned and secured thereon, being raised to the proper height, two corner-irons 23 are placed between dies 17 of fixtures 5 and 10 on bars 18, as shown in Figs. 5, when, through treadle 16 and lever 11, fixture 10 will be forced backward toward fixture 5, thereby gripping the corner-irons between dies 17, and forcing the irons not only into right lines edgewise, but also bringing the two arms of the one at the angle of the fixture at exactly ninety degrees each with the other. Then the drop will be liberated and allowed to fall, thereby bringing the edges 22 of the striking-dies into contact with the plane of the corner-iron with such force as to displace the particles thereof sufficiently to hold the iron when released in the form which it occupied when clamped, as described, it being necessary for the durability of all

parts and the proper working thereof that the center of gravity of the drop be over the center of the object of resistance when the drop falls, and as the two arms or angles of one-half the corner-irons 23 are of greatly diverse lengths—one arm being about four inches and the other about nineteen inches long—therefore it is necessary to provide some means by which there shall be an equal length of corner-iron in each angle of the fixtures to receive the impact of the striker; and to effect this I form the angles of the fixtures of a greater length than the shorter arms of the corner-irons and of a less length than the longer arm of said irons, and I place two of said irons in the clamping device to be operated upon by the striker at the same time. The iron which is struck in a part only of its longer arm by edge 22, as indicated at 24, Fig. 5, is next placed so that both its arms will be struck, while a new iron is placed with it in the fixtures so that part of its long arm only will be acted upon. Thus at each fall of the drop the straightening of one corner-iron is completed and that of another partly effected. When corner-irons having short arms of equal length are to be straightened, the fixtures may be so arranged relatively to the drop that the centers of gravity and resistance will coincide; or the fixtures may be so formed as to receive two corner-irons entire, one being on each side the center of the drop.

It will be obvious that it is not requisite that the corner-irons when held in the clamping-dies before being struck should lie fairly on the steel bars or bed 18, because the irons are so narrow that they will not be bent in cross-section, even though some portion of them when clamped did not rest on said bed, as the first effect of the blow delivered by the drop would be to carry them down flat and fair upon the bed, when the effect of the striking-die would result, which fixes and holds them in their thus aligned and right-angled form.

I am aware that it is common to flatten bodies of metal and bring them into plane in a cold state by subjecting them to the force exerted by a drop, and hence I do not claim, broadly, the straightening of metal by means of a drop, my method consisting in holding the bodies to be straightened and squared between rigid clamps, and then subjecting them to the force of a blow exerted through suitable dies that create a partial displacement thereof.

It will be obvious that fixtures 5, 10, and 18 and bed 2, instead of having their respective steel bars 17, 18, and 21 formed separate and secured thereto, could have the same formed integral; but for the purpose of replacement when worn, and for other obvious reasons, the construction shown is preferred, and the means and method of adjusting bed 2 and fixture 5, as also the means of actuating fixture 10, may be varied as desired without departing from the spirit of my invention.

As these corner-irons require to have the upper surface true and level, and as they are of necessity "rights" and "lefts" in order to be applied to the right and left hand corners 5 of the body, it is therefore obvious that if struck with a force to indent them, as shown at 24, one-half of them must be arranged in the clamping device the opposite from that shown in Fig. 5, so that the depression 24 10 shall in all of them be upon the under side, and therefore out of sight after they are applied to the body. With the narrower corner-irons the edges 22 of dies 21 may be of such width and the drop of such weight that 15 no depression will be formed thereby in the corner-iron, it being obvious that a narrow face of bars 21 will the more readily displace the corner-iron when it is struck, and that to a certain extent the increase of the weight of 20 the drop or reducing the thickness of edges 22 would be equivalent in their effect upon the corner-irons.

I am aware of United States Patent No. 400,994, issued April 9, 1889, and I claim nothing that is claimed therein, said patent having been granted for a method of swaging already imperfectly forged or formed copper 25 bodies or blanks by hammering the upper exposed edge of the bar to reduce said bar to the right breadth, and at the same time to 30 straighten the bar and also secure a hardened surface on the edge (so hammered) of the bar, as is specified in the claim in said patent, while in my invention the corner-irons are

neither forged nor "swaged," (which latter is 35 but a reforging,) as the corner-irons are cut in the cutting-press to their exact permanent dimension in every part, and are subjected to my method for the purpose of straightening 40 only, and not for the purpose of changing their dimensions or form.

I claim as my invention—

1. The herein-described method of straightening corner-irons, the same consisting in clamping them edgewise in dies of proper 45 form while they are arranged upon a bed, and then striking them upon one plane or side with dies having a face of less width than that of the corner-iron, and with a force sufficient to produce a sufficient longitudinal depression 50 in the iron so struck as to permanently retain them when released in the straightened position which the iron occupied in the die after being so struck, substantially as specified. 55

2. The combination of bed 2, having a supporting-surface 18 for the corner-irons, fixtures 5 and 10, having clamping-faces 17 to receive and clamp the corner-irons, a treadle mechanism to force said fixture 10 toward 60 fixture 5, fixture 19, provided with the striking edges or bars 22, a drop to which 19 is secured, and a press in which said drop may be actuated, all substantially as specified.

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Witnesses:

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