

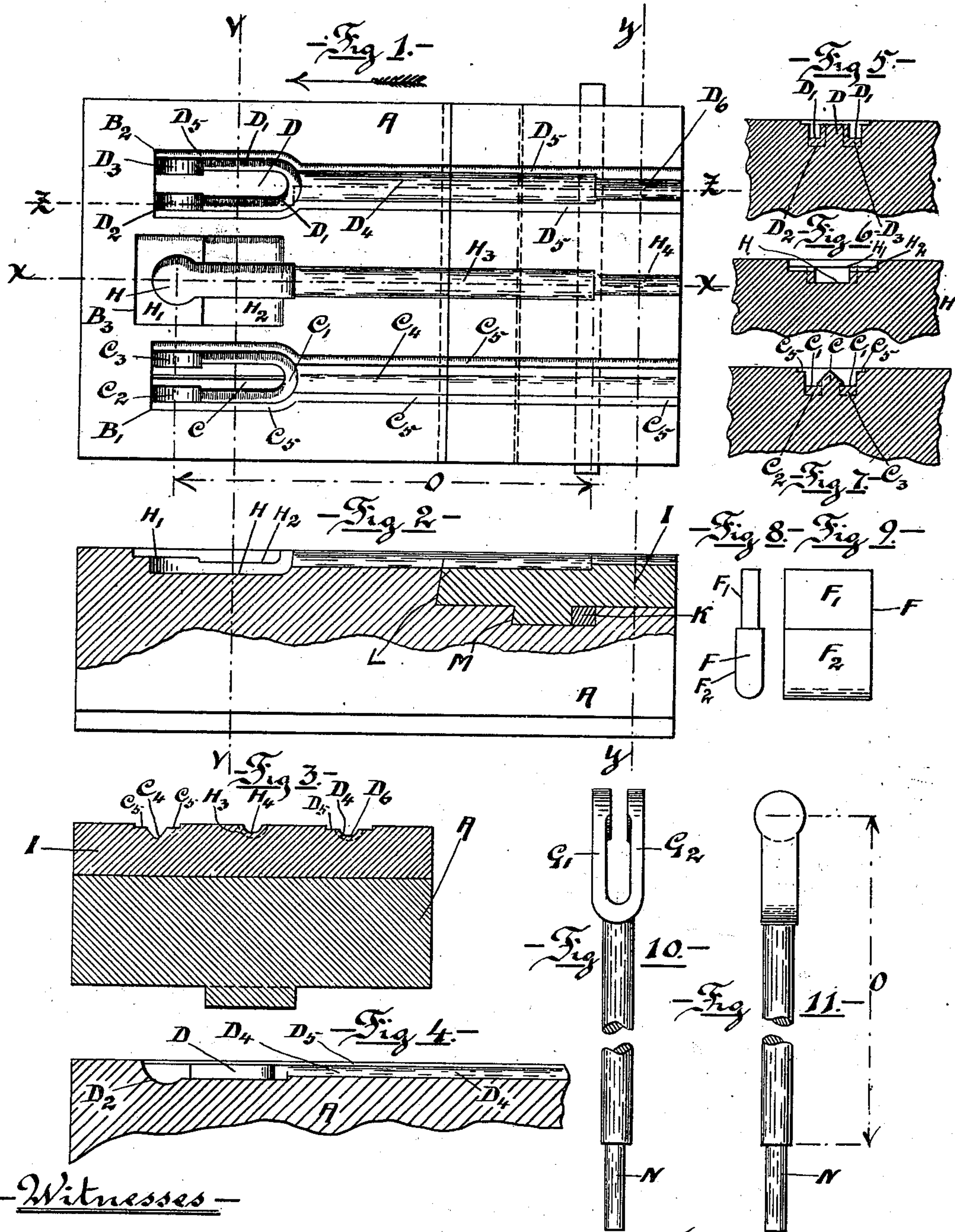
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Patented Oct. 30, 1900.

W. L. JONES.
DIE FOR FORGING FORK HEADED RODS.

(Application filed Oct. 7, 1898.)

(No Model.)



—Witnesses—

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DIE FOR FORGING FORK-HEADED RODS.

SPECIFICATION forming part of Letters Patent No. 661,014, dated October 30, 1900.

Application filed October 7, 1898. Serial No. 692,880. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. JONES, a citizen of the United States, residing at Arlington, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Dies for Fork-Headed Rods; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form part of this specification.

My invention relates to the manufacture of fork-headed rods—that is, rods that are furnished with jaws or a forked head, such as may be applied to any ordinary coupling-rod and that more especially in the railroad signal-manufacturing shops are used under the name of “switch-rods.” As one of the main points in my invention consists of furnishing these fork-heads with inside bosses, it will be readily understood that in any department of the machine trade where such fork-heads or jaws having inside bosses can be used any manufacture of such fork-heads by means of my improved dies and the process connected therewith will be an infringement on my rights.

The dies which form the mechanical means of my invention are, like all ordinary dies, composed of an upper and an under die, each appropriately secured in a press, drop, or steam hammer.

The improvements in the coupling-rods obtained by the use of my improved dies and that form the object of my invention reside mainly in three important facts. First, I manufacture the entire rod in one heat, as against the rods hitherto produced by press-dies, requiring no less than three heats and frequently more, the application of these frequent heats, as is well known, weakening the metal; secondly, I place the bosses required on such rods on the inside of the jaws instead of, as hitherto done, on the outside, which enables the rod, in whatever capacity it may be used, to pivot closer to its companion link; thirdly, I am enabled by my improved dies to manufacture the bottom or throat of the jaws round instead of pointed, thus preventing the

catching of the companion rod by the acute-angled jaws as they are manufactured at the present date and giving more strength to the throat of the jaw by the additional material gained at the point where the fork joins the main body of the rod. I might here call attention to Letters Patent No. 501,851, of July 18, 1893, as a proof of what my invention has accomplished in the improvement of these fork-heads or jaws by requesting a comparison between the jaws shown in Figure 14 of the drawings of said patent and the jaws as manufactured by me shown in my drawings, Figs. 10 and 11. Finally, I embody a device for lengthening or shortening the rods when used as switch-rods, according to the standard length of said rods as adopted by the different railroads, which will be described more fully in the ensuing description.

In proceeding to describe my invention containing the above-stated improvements I shall refer to the accompanying drawings, where like letters of reference indicate corresponding parts in the different views.

Fig. 1 shows a top view of one of the dies, and as the other die is an exact counterpart of its companion die it will be sufficient to illustrate only one. Fig. 2 is a side view of Fig. 1 with a part broken off according to a line X X through the finishing-matrix B³ in Fig. 1. Fig. 3 is a section through the end of the die on the line Y Y, Figs. 1 and 2. Fig. 4 is a sectional side view through the broken line Z Z of Fig. 1. Fig. 5 is a sectional end view of the matrix B² through the line V V in Fig. 1 looking in the direction of the arrow. Fig. 6 is a sectional end view of the matrix B³ looking in the direction of the arrow. Fig. 7 is a sectional end view of the matrix B' looking similarly, as in the two former cases, in the direction of the arrow. Fig. 8 is an end view of the mandrel fitted in between the jaws as used in the finishing process in matrix B³. Fig. 9 is a side view of Fig. 8. Fig. 10 is an end view of the finished rod as manufactured by my improved dies, the upper half representing an ordinary jaw or fork-head, which can, as before stated, be applied to any suitable purpose, the lower part when taken together with the upper making a complete switch-rod; and, finally, Fig. 11 is a side view of Fig. 10.

In Fig. 1, A indicates either the upper or

the under die, the two halves being, as before stated, exactly alike in construction.

B', B², and B³ indicate, respectively, the splitting, the roughing, and the finishing matrices for the switch-rod during its process of manufacture.

In B', where the splitting process takes place, C indicates the part which cleaves the rod into the two prongs or jaws G' and G², and it is to that effect V-shaped in section, as seen in Fig. 7. C' is the flat bottom surface, which gives shape to the individual prongs on each side of the cleaving part C. C² and C³ are the semicircular cavities that form the inside bosses, and C⁴ is the bed running longitudinally throughout the entire length of the die, V-shaped, with a rounded bottom, as shown in Fig. 3, which gives the rod the primary rough angular form, which in the second matrix B² becomes circular and additionally receives its tang-end shape. C⁵ is a narrow ledge which borders the entire matrix to receive the superfluous metal that might be squeezed out at the sides between the upper and lower dies.

The second step in the process, which I call the "roughing" process, is performed in the matrix B², in which D indicates the part that separates the prongs of the fork and which acts in the same capacity as did formerly the part C in B'. The shape of part D is, however, changed from being V-shaped in section to the square form, as shown in the sectional view in Fig. 5, giving thus the perfect form to the prongs as they are seen in Fig. 10. D' indicates here, as in the instance of C' in B', the bottom surface of the die for the prongs D², and D³ the semicircular cavities for the formation of the inside bosses. D⁴ indicates the semicircular bed running longitudinally through the die, corresponding to C⁴ in B', with this difference, however, that it does not run throughout the entire length, but stops at D⁶, which is a semicircular bed of smaller diameter than D⁴, which forms what is technically known as the "tang end" of the switch-rod.

For the purpose of getting rid of the superfluous metal that has been squeezed out at the sides of the matrices B' and B² in the ledges C⁵ and D⁵ an ordinary trimming-die, such as is used in connection with all drop-forgings, is utilized before passing the rod into the finishing-matrix B³.

The last step in forming the rod is performed in the matrix B³, where the finishing process takes place. In this instance the rod is turned on its side, as illustrated in Fig. 11, and in order to keep the prongs apart and smooth on the interior of the jaws a mandrel F' is inserted between the prongs previous to the rod being laid in the matrix B³ and stamped. H indicates here the bottom surface of a bed receiving the lower prong G', for instance, said surface being at right angles with the sides of the bed H', the flat surface on which partly rests the surface F' of the mandrel F,

the said part of the mandrel to that effect being depressed as compared with its other part having the surface F², and the surface H' being raised correspondingly and as compared with the surface H², said surface H² receiving consequently the surface F², as indicated. H³ is the semicircular longitudinal bed corresponding to D⁴ in B², and H⁴ is the similarly-semicircular bed, but of smaller diameter than H³, that finishes the tang end of the switch-rod. It now remains to show how the above-described dies A can be made adjustable, so as to be able to form any switch-rod to a given standard length. This I accomplish by making the end of the die a separate part by itself.

In Fig. 2, I indicates a piece which can be inserted in the main body A of the dies and held there by a wedge K. As readily seen in the sectional view of Fig. 2, the sides L and M of the part I are oblique, so that when the wedge K is inserted the part I will be held immovably to the main body of the die. It will consequently be very apparent that the tang end (marked N) can be moved any suitable distance to and from the fork-head, all according to the part I that may be used, meaning thereby that the distance O, as indicated in Figs. 1 and 11, can be varied with any change of the adjustable end piece I, according to the lengths of tang-end beds D⁶ and H⁴ in the dies.

That various minor mechanical details in the three different steps of this process as relating to the matrices may be altered, so as to make it more perfect, is self-evident, the main points, however, of performing this entire process in one single heat by the three herein-described graduated steps and being capable of altering the length of the switch-rod according to any desired standard length remaining constant unvarying features. As was pointed out in my preamble, the formation of these jaws with inside bosses will undoubtedly be found very practical in several branches of the machine trade, inasmuch as the manufacture of these jaws by steam-presses instead of by hand will naturally reduce them vastly in cost, involving the same process of one single heat and three graduated matrices, but with shorter dies, forming only the jaws or fork-heads, and such manufacture as the latter I shall consider an infringement on my rights, for—

What I claim, and desire to secure protection for by Letters Patent, is—

1. As a new article for the manufacture of fork-heads with inside bosses, a pair of horizontally-operated equivalent die parts, each part having a splitting, roughing and finishing matrix substantially as they are illustrated and described, forming the said inside bosses on the fork-heads in one heat.

2. In the manufacture of fork-headed rods having tang ends, the fork-heads having inside bosses, the combination of an upper and lower die transversely recessed to receive the

detachable, interchangeable tang-end-forming sections of the dies substantially as set forth and described.

3. As a new article of manufacture, a pair of horizontal dies having three graded matrices for forming fork-headed rods with inside bosses, said dies being transversely recessed to receive the detachable, interchangeable tang-end-forming sections of the dies, substantially as set forth and described.

4. In the manufacture of fork-headed rods, the combination of an upper and lower die, each die having a splitting, roughing and finishing matrix, said dies being transversely recessed to receive the detachable interchangeable tang-end-forming sections of the dies, substantially as set forth and described.

5. In the manufacture of fork-headed rods having fork-heads with inside bosses, the combination of an upper and lower die, a splitting-matrix forming part of each upper and lower die, having a V-shaped cleaving-stump, two semicircular-shaped cavities adjacent to and indenting the cleaving-stump, a continuous V-shaped bed merging into the bed for forming the prongs of the fork, a roughing and finishing matrix formed in said upper and lower dies substantially as described.

6. In the manufacture of fork-heads or jaws having inside bosses, the combination of upper and lower equivalent die parts, each die having a splitting, roughing and finishing horizontal matrix, and a recessed mandrel to be inserted between the jaws in the finishing-matrix for the purpose as specified substantially as described.

7. In the manufacture of fork-headed rods,

the combination of an upper and lower equivalent die, each die having a splitting-matrix, a roughing-matrix having a stump separating the prongs square in section, two semicircular cavities adjacent to and indenting the separating-stump, a bed for the body of the rod, semicircular in section and having two different diameters substantially as set forth and described.

8. In the manufacture of fork-headed rods the combination of an upper and lower die, each die having a splitting-matrix, a roughing-matrix, a finishing-matrix having a right-angled bed conforming to the shape of the fork-prongs, two surfaces cut in the face of the dies embracing the bed of the prongs of the fork, and a mandrel inserted between the prongs of the fork-head so as to rest on said surfaces substantially as and for the purposes described.

9. The combination of an upper and lower die, a splitting, roughing and finishing matrix formed in each die, an inside boss-shaping mandrel to be inserted between the prongs of the fork-head in the finishing-matrix during the process of forging, a detachable interchangeable tang-end-forming section adjutably secured in the upper and lower die, trimming-surfaces furnished around each matrix substantially as it is illustrated and described.

In testimony that I claim the foregoing I have hereunto set my hand this 21st day of September, A. D. 1898.

WILLIAM L. JONES.

Witnesses:

ALFRED B. VAN LIEW,
AUGUST M. TRESCHOW.