

(No Model.)

2 Sheets—Sheet 1.

H. KIMBALL.

DIE FOR THE MANUFACTURE OF TURN BUCKLES.

No. 285,275.

Patented Sept. 18, 1883.

Fig. 1.

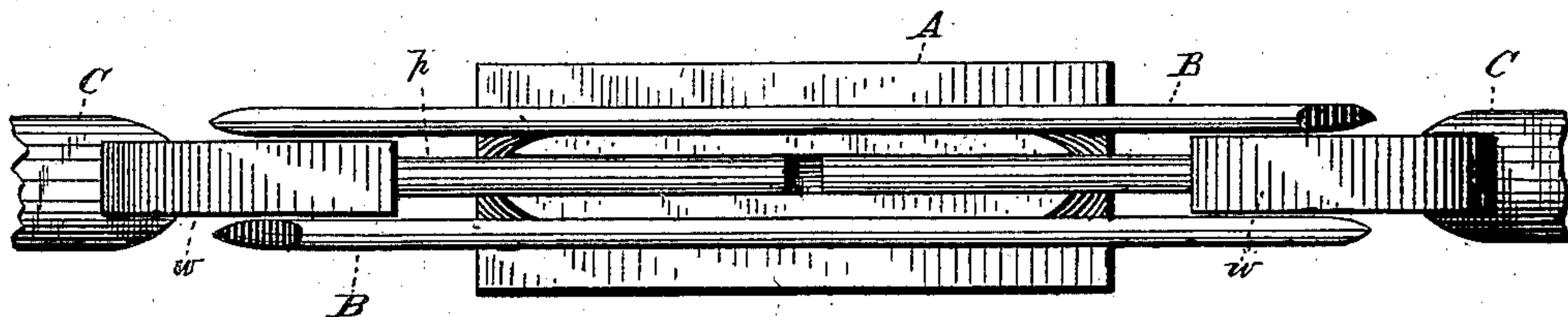


Fig. 2.

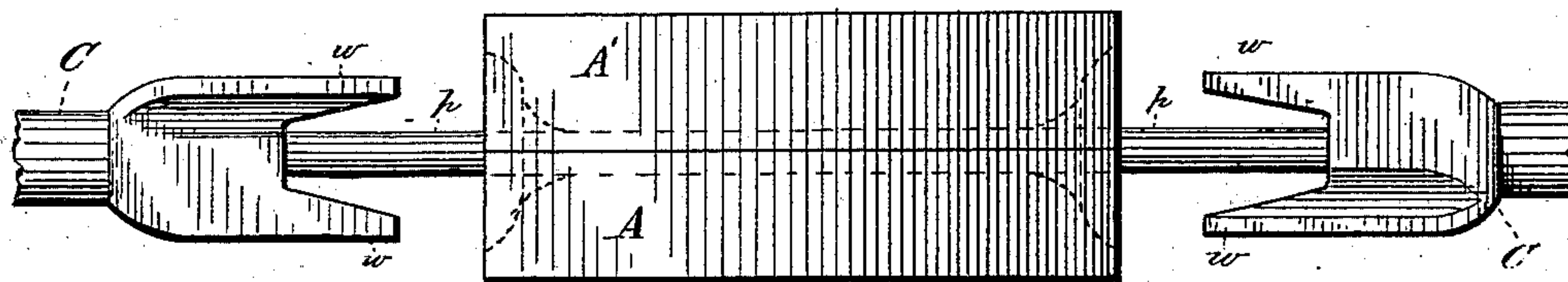
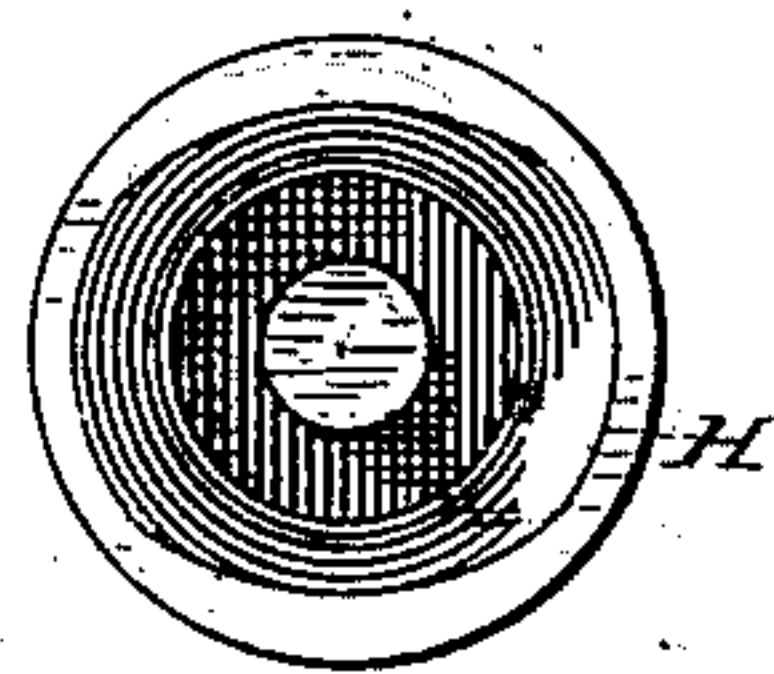
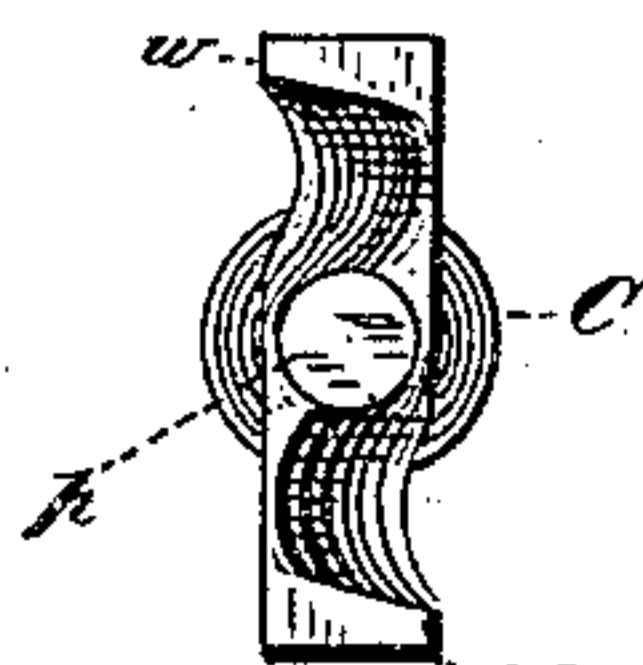
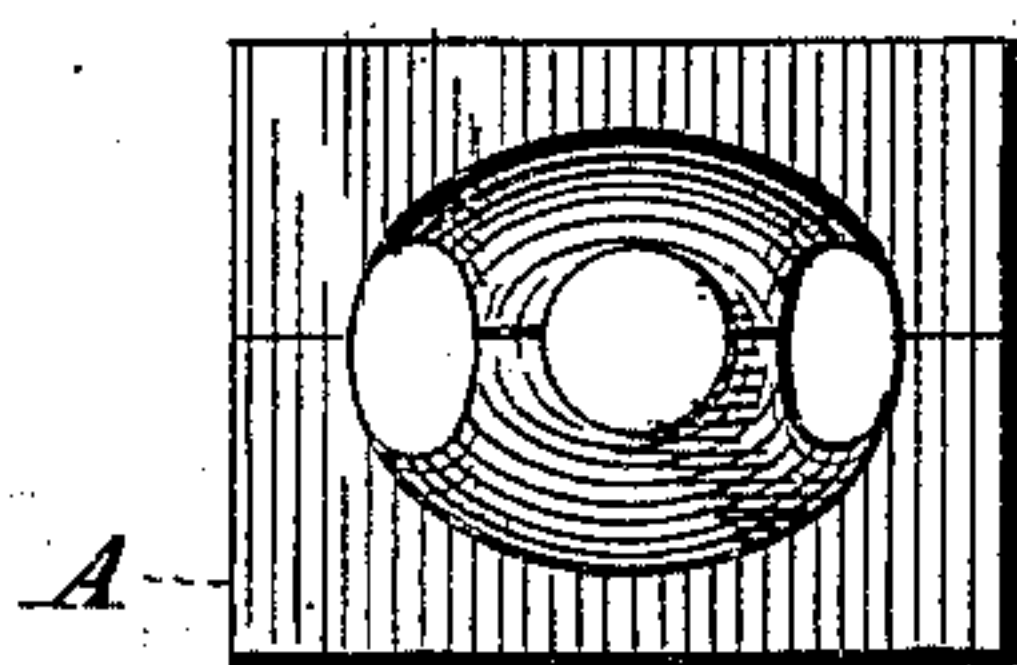


Fig. 3.

Fig. 4.

Fig. 5.



WITNESSES

Ch. Engel
W. E. Donnelly

Hiram Kimball. INVENTOR

By Leggett & Leggett ATTORNEYS

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Fig. 6.

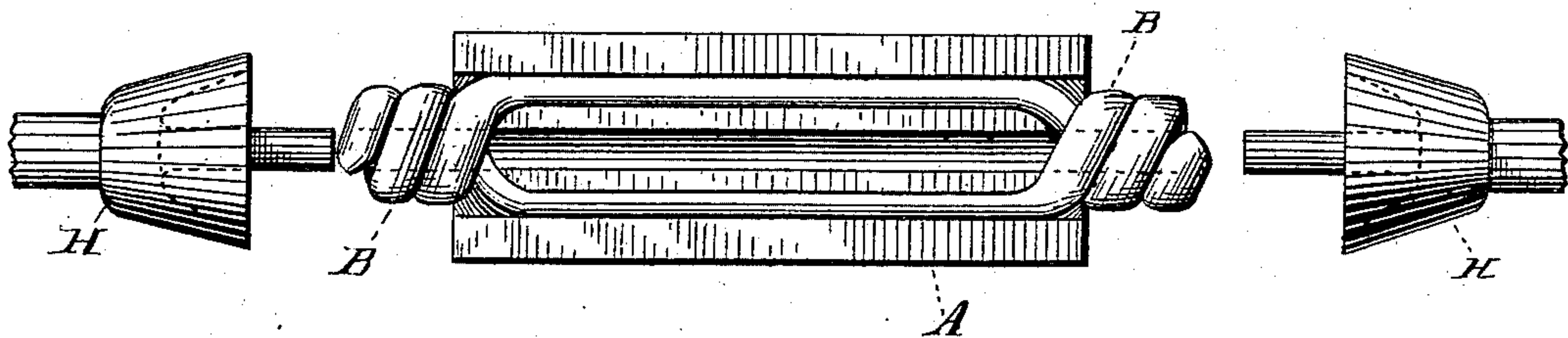


Fig. 7.

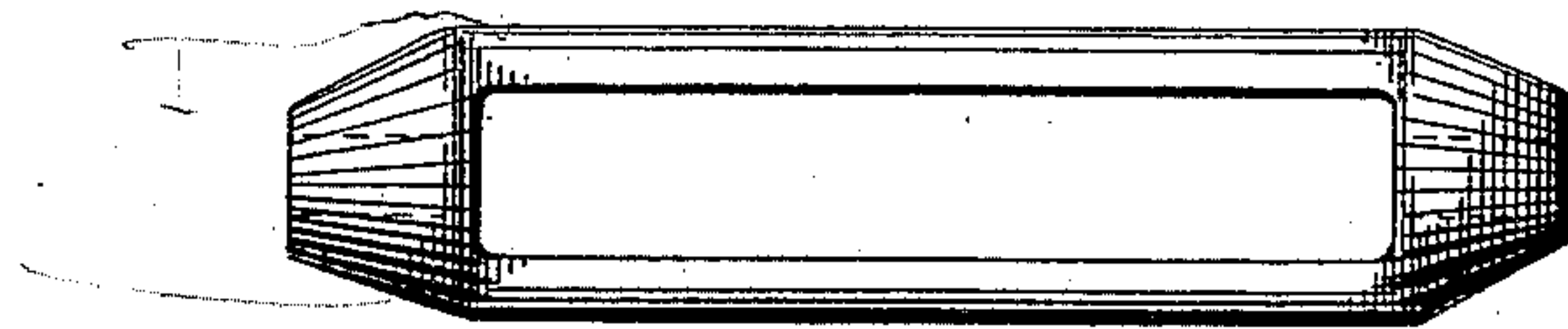


Fig. 8.



WITNESSES

W. Engel
W. E. Donnelly

Hiram Kimball

INVENTOR

By Leggett & Leggett

ATTORNEYS

UNITED STATES PATENT OFFICE.

HIRAM KIMBALL, OF CLEVELAND, OHIO.

DIE FOR THE MANUFACTURE OF TURN-BUCKLES.

SPECIFICATION forming part of Letters Patent No. 285,275, dated September 18, 1883.

Application filed June 18, 1883. (No model.)

To all whom it may concern:

Be it known that I, HIRAM KIMBALL, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful
5 Improvements in Dies for the Manufacture of Turn-Buckles; 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 pertains to make
10 and use the same.

My invention relates to the manufacture of what are commonly known as "arm-swivels" or "turn-buckles," and particularly to a method of making such articles, in which the sockets
15 at the ends are forged out of stock obtained by coiling together the adjacent ends of two bars, the central portions of which form the connecting-arms; and it consists in the tools described for doing such work.

20 I am aware that others have made such turn-buckles with more or less success by forging the sockets out of stock obtained by coiling together the ends of two bars, the central portions of which form the connecting-arms; but so
25 far as I know the sockets have heretofore been forged out of the coiled metal, either by an ordinary hand-hammer or by means of blows with dies acting on the sides of the metal in such manner that only one end could be forged
30 at a time, and then in an unsatisfactory manner, as the lateral blows have a tendency to draw out and crystallize the connecting-arms at the point of union with the sockets, and it is difficult, if not impossible, to forge a turn-
35 buckle by repeated lateral blows, even with dies in a steam-hammer, so as to avoid internal strains being a source of weakness, as before being finished the metal becomes rigid and the blows are sure to draw it unequally.

40 By the tools described herein I am able to coil both ends of the bars simultaneously, and also not only to forge both coiled ends into sockets at the same time, but by means of pressure of dies acting longitudinally on the
45 ends of the metal to upset and enlarge the ends of the arms, so as to make a gradual swelling union with the sockets, and a much stronger buckle than can be made by lateral forging.

50 In the drawings, Figure 1 is a plan view of dies used for coiling the ends of the bars together, the upper part of central holding-die

being removed, showing the bars to be worked in position ready to be coiled. Fig. 2 is an elevation of the same dies, both halves of the central holding-die being shown together, but
55 without the bars of metal to be worked. Fig. 3 is an end view of the central holding-dies. Fig. 4 is an end view of the coiling dies or heads. Fig. 5 is an end view of a die used for forging the coiled metal into sockets. Fig. 6
60 is a plan view of dies used for forging the metal into sockets after it is coiled, the upper half of the central holding-die being removed, showing the metal to be worked, with the ends coiled together in position to be forged. Figs. 65
7 and 8 are side and edge views of a forged turn-buckle as made by such dies.

I do not show any frame-work for holding or mechanism for operating the dies, as they may be of ordinary well-known forms, and I
70 conceive that any particular forms invented by me may properly be the subject of application for separate patents.

The central holding-dies, as shown in Figs. 1, 2, and 3, and in Fig. 6, may be of the same
75 form, or even the same dies may be used in both cases, so I refer to them by the same letter, A. They are in two parts, A A', opening in the center, as shown in Figs. 2 and 3. Of course they must be provided with convenient
80 mechanism for opening and closing, which is most conveniently done by raising and lowering the upper half, A', Figs. 2 and 3.

In Fig. 1 B B are two bars to be worked into a turn-buckle in position to be coiled, the same
85 bars being shown with the ends coiled together in Fig. 6.

C C are dies or heads for coiling the ends of the bars together, the form being shown more clearly by the elevation in Fig. 2, and end
90 view, Fig. 4.

Plain rolled bars B B are first laid in the central holding-die, A, as shown in Fig. 1. The coiling-heads C C being in position, as shown in Figs. 1 and 2, the upper half, A',
95 Figs. 2 and 3, of the central holding-die is closed down, so as to hold the bars firmly in position. The coiling-heads are then made to revolve both to the right when grooved, as shown in the drawings, coiling the ends of the
100 bars B B together, as they are shown in Fig. 6. The coiling-heads are then withdrawn and the

bars B B as coiled together taken out. After being brought to a welding heat they are again placed in the same or similar central holding-dies, in line with what I will call "heading-dies H H," as shown in Fig. 6. The holding-die is again closed firmly and the heading-dies H H are quickly driven forward against the coiled metal with sufficient force to weld and forge it into sockets of the form of the cavities in the ends of the dies. In the holding-dies A A' the cavities in which the bars B B are placed are enlarged at the ends in an oval bell-mouth form, as shown by dotted lines in Fig. 2, so that the bars are upset and enlarged to increase the strength and avoid a sharp angle at the point of union with the sockets, as shown in the finished forging, Figs. 7 and 8.

By the operation herein described the metal is pressed into form almost instantly, and the work is all done while it is at a soft and uniform heat, so that internal strains are avoided and a perfect weld insured. It is obvious that the same results may be accomplished by working only one end of the bars at a time, which is the most convenient way when making very long buckles, in which case only one coiling-head C or heading-die H is required, in combination with the central holding-die, A A'.

The coiling-heads C C consists, essentially, of a central pin or mandrel, *p*, and a web with two projecting arms, *w w*, of such form as to draw in and wind the ends of the bars B B around the central pin, *p*.

I claim as my invention and desire to secure by Letters Patent—

1. In machinery for forging turn-buckles or analogous shapes, a coiling head or die, C, having a central pin or mandrel, *p*, and two projecting arms or wings, *w w*, substantially as and for the purpose described.

2. The central holding-die, A A', in combination with one or more coiling-heads for coiling together the ends of two bars, substantially as described.

3. In machinery for forging turn-buckles or analogous shapes, the combination, with central holding-dies, A A', of one or more heading-dies, H, adapted to be operated substantially as and for the purpose set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 15th day of June, 1883.

HIRAM KIMBALL.

Witnesses:

JNO. CROWELL,
CHAS. H. DORER.