

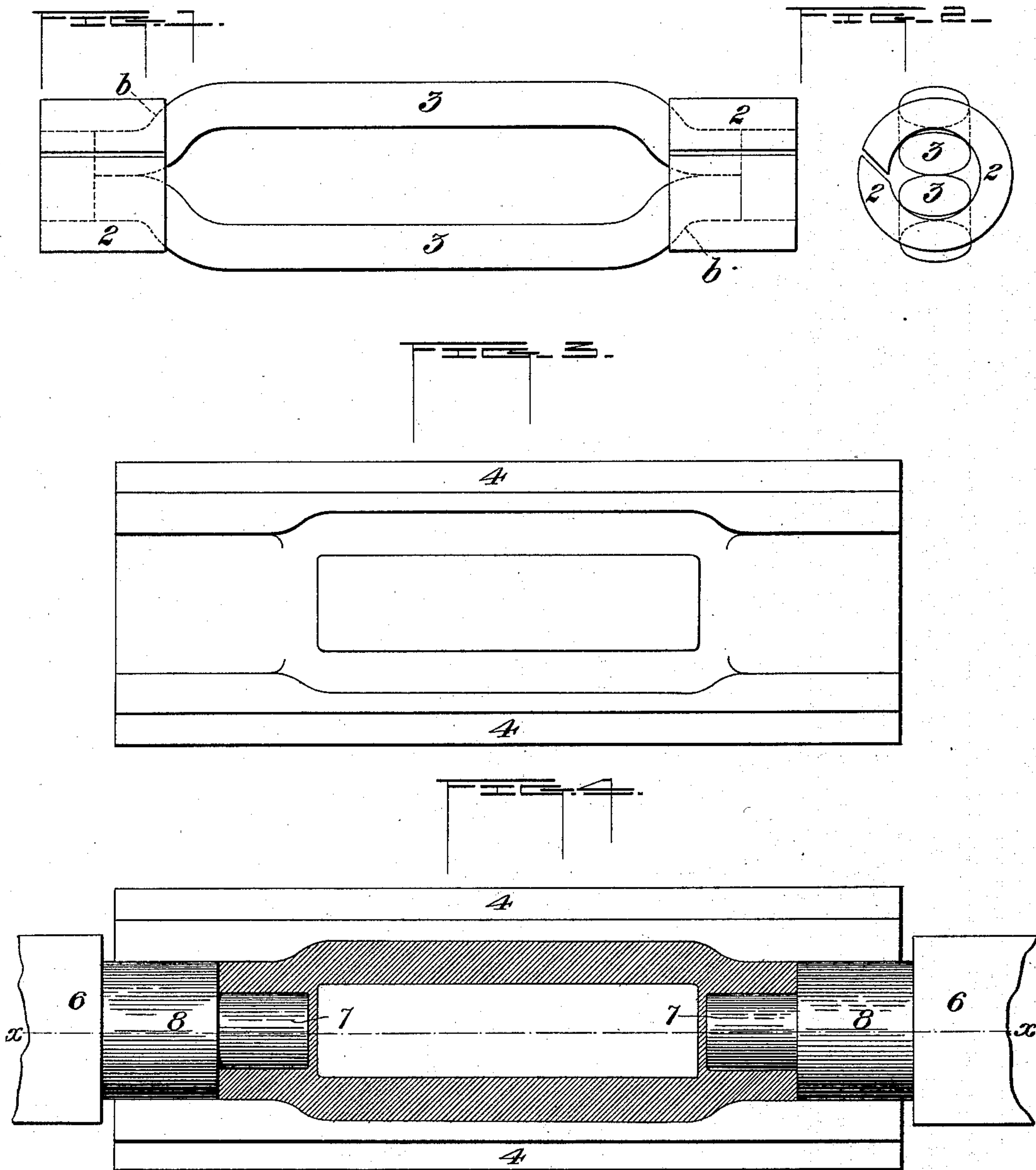
(No Model.)

2 Sheets—Sheet 1.

J. H. SIMPSON.
ART OF MAKING TURN BUCKLES.

No. 410,120.

Patented Aug. 27 1889.



WITNESSES

W. B. Corwin
J. K. Smith

INVENTOR

James H. Simpson
by W. Baxendell & Sons
his Attorneys

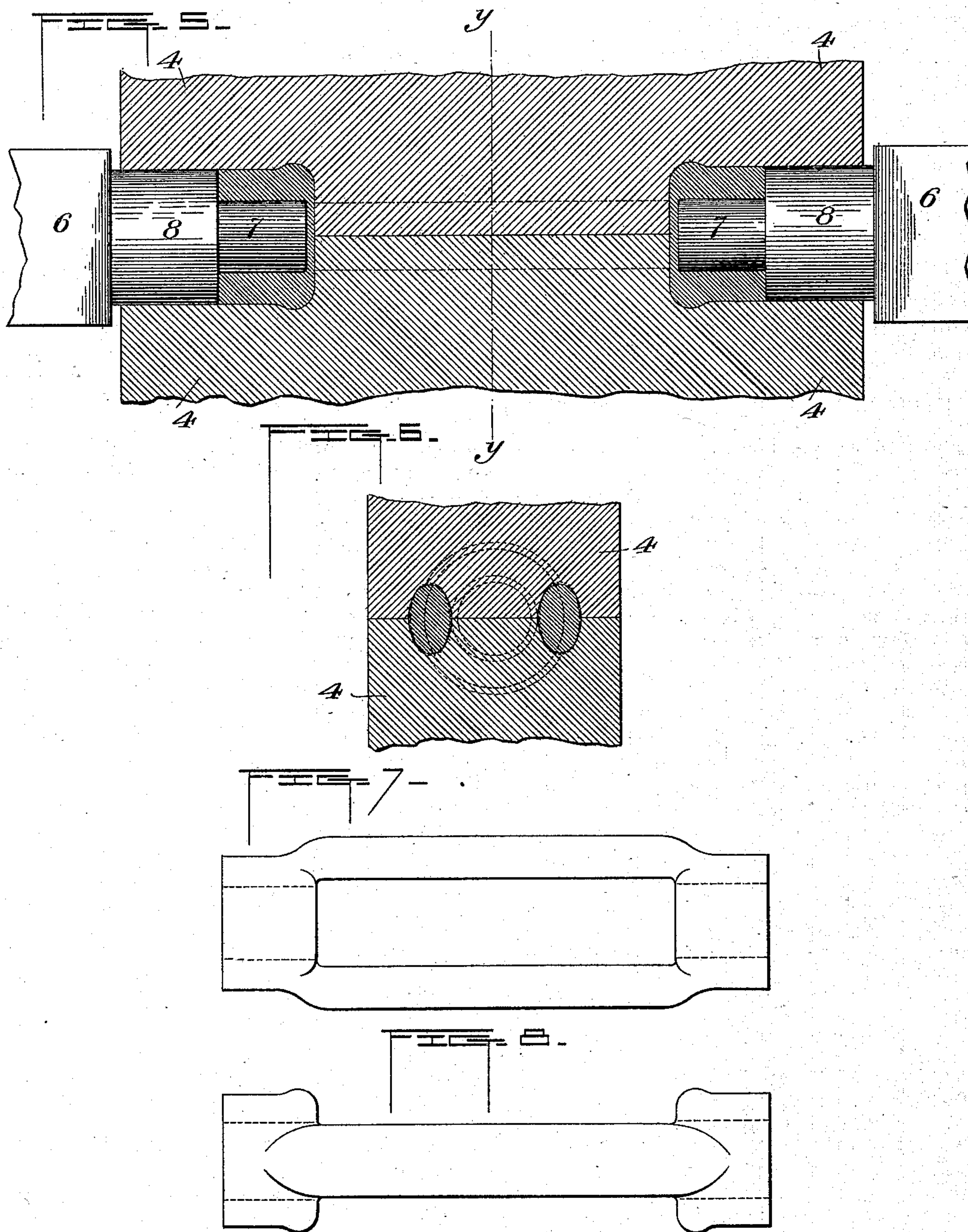
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UNITED STATES PATENT OFFICE.

JAMES H. SIMPSON, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO CARNEGIE,
PHIPPS & CO., (LIMITED,) OF SAME PLACE.

ART OF MAKING TURN-BUCKLES.

SPECIFICATION forming part of Letters Patent No. 410,122, dated August 27, 1889.

Application filed May 6, 1889. Serial No. 309,684. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. SIMPSON, of
Pittsburg, in the county of Allegheny and
State of Pennsylvania, have invented a new
5 and useful Improvement in the Art of Mak-
ing Turn-Buckles, of which the following is
a full, clear, and exact description, reference
being had to the accompanying drawings, in
which—

10 Figure 1 is a plan view illustrating the
blank from which a turn-buckle may be made
according to my invention. Fig. 2 is an end
view thereof. Fig. 3 is a plan view of one of
the dies which I use in the manufacture of
15 the turn-buckle. Fig. 4 is a plan view of the
same in connection with the end mandrels or
tongues which are used to shape and com-
press the nuts or ends of the turn-buckle, the
turn-buckle being shown thereon in longi-
20 tudinal section. Fig. 5 is a vertical longi-
tudinal section on the line *x x* of Fig. 4. Fig.
6 is a vertical cross-section on the line *y y* of
Fig. 5. Fig. 7 is a plan view, and Fig. 8 is a
side view, of the finished turn-buckle.

25 Like symbols of reference indicate like
parts in each.

In practicing the method of manufacture
I first form a blank comprising side pieces,
which constitute the straps of the turn-buckle,
30 and end pieces, which form the heads or nuts,
and place such blanks between lateral dies,
which grasp and hold the same firmly, clos-
ing in upon the blank, so that their faces
shall fit neatly together. These side dies are
35 not designed of themselves to exert any sub-
stantially forging or shaping action on the
blank, but simply to close in upon and to
hold the same, the forging and shaping be-
ing performed by end dies which enter cavi-
40 ties of the side dies, engage the ends of the
blank and force the same inwardly, so as to
displace the metal of the blank and to cause
it to fill the die-cavity and to assume accu-
rately the shape thereof. For this purpose
45 the blank is originally formed preferably of
somewhat less cross-sectional area than the
die-cavity, or at least of no larger cross-sec-
tion. The result of such method of manu-
facture, as distinguished from a method in
50 which the blank is reduced and shaped by
lateral action of the dies, is that the turn-

buckle is formed without fins, no metal is
wasted, and the subsequent side finishing
or dressing necessary when lateral fins are
formed on the blank may be dispensed with. 55

In the practice of my method the blank
may be formed in any of the modes hereto-
fore known in the art; but for the sake of
more clearly illustrating my invention I have
shown in the drawings a form of blank which 60
is described in a prior patent application,
Serial No. 285,505, filed October 8, 1888, and
I shall describe my present invention as re-
gards its application to such blank. I first
form a compound blank of the sort shown in 65
Figs. 1 and 2, which is composed of two pieces
3 of iron, preferably of the shape in cross-
section and about the desired length of the
straps of the finished buckle, and shape them
into the form shown in Fig. 1, so that when 70
placed together, as shown in that figure, their
ends shall be in contact and their middle por-
tions spread out from each other, though the
last-named feature is not essential, as the
strap-pieces may be made substantially par- 75
allel and spread after they have been united
at the ends, as hereinafter described. The
ends of the strap-pieces are then confined to-
gether by bands or rings 2, which are placed
over these ends, and are preferably of suffi- 80
cient length to project beyond the same.
These bands or rings may consist of strips of
metal scarfed at the ends and bent round
into annular form, the scarfed ends being
adapted to be subsequently united in the 85
shaping and welding of the turn-buckle; or
the bands may consist of rings or sections of
tubing completely welded before they are put
on the strap-pieces. The material of which
the bands are made is preferably scarfed at 90
the end, as at *b*, to conform to the shape of
the shoulders of the strap-pieces 3 and to
prevent the band from cutting into these
strap-pieces in the end compression of the
dies. When the compound turn-buckle blank 95
has been so formed, it is, when at a welding
heat, welded and shaped into the finished turn-
buckle by any suitable means, the parts 3
forming the straps of the buckle and the
bands 2 forming the nuts or heads. I have 100
illustrated dies for this purpose in Figs. 3, 4,
5, and 6. They consist of two dies for hold-

ing and operating on the blank laterally, and two mandrels and compressing-dies, which operate on the blank at the ends and reduce it to its finished shape. There are two dies 4 4, which act on the sides of the blank. These are provided with cavities shaped conformably to the shape of the finished buckle, having end cavities open externally for the nuts of the buckle.

6 6 are the plungers which carry the dies used to shape the heads or nuts of the buckle. These plungers carry at their ends tongues or compressing-mandrels 7, which are adapted to enter the bands 2 within the end cavities of the dies 4, and at their bases are annular collars 8, which also enter the end cavities of the dies and engage the outer extremities of the bands.

The plungers 6 are actuated by cams, sliding wedges, or any other convenient power devices.

As shown in Fig. 6, the dies meet when closed together upon the blank, and the original cross-section of the parts of the blank (as shown by dotted lines in said figure) is no larger and is preferably somewhat smaller than the cross-section of the corresponding portions of the die-cavity.

The operation is as follows: The compound blank, at a welding heat, is placed between the dies 4 4. These dies are actuated so as to cause them to compress the interposed blank, and the plungers 6 6 are actuated so that the tongues 7 shall enter the cavities at the ends of these dies and shall engage the extremities of the strap-pieces 3, while the collars 8 engage the extremities of the bands

2. The end compression of these tongues and collars forces the bands inwardly on the strap-pieces, welding them securely thereto, and forces the hot metal of the bands and of the ends of the strap-pieces into the lateral recesses of the end cavities of the dies, thus giving the ends of the buckle their proper shape and forming shoulders thereon, which impart great strength to the finished article; and the end compression also exerted upon the straps causes the hot material thereof to flow out laterally and to fill the die-cavity, thus bringing them to the exact shape required, the dies 4 meanwhile holding the blank firmly and supplying the necessary resistance to the end compression. By these means the buckle is formed without lateral fins at the partings of the dies, the manufacture is cheapened, and a strong and shapely article is obtained.

I claim—

An improvement in the manufacture of turn-buckles, which consists in forming a blank having side pieces and end pieces, confining the blank in a die the cavity of which is closed laterally, and subjecting the blank to end compression, whereby the material of the side pieces and end pieces of the blank is upset or compressed and is caused to fill accurately the cavity of the die, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 2d day of May, A. D. 1889.

JAMES H. SIMPSON.

Witnesses:

THOMAS W. BAKEWELL,
W. B. CORWIN.