

(No Model.)

C. B. BEACH.

MACHINE FOR MAKING TURN BUCKLE BLANKS.

No. 438,092.

Patented Oct. 7, 1890.

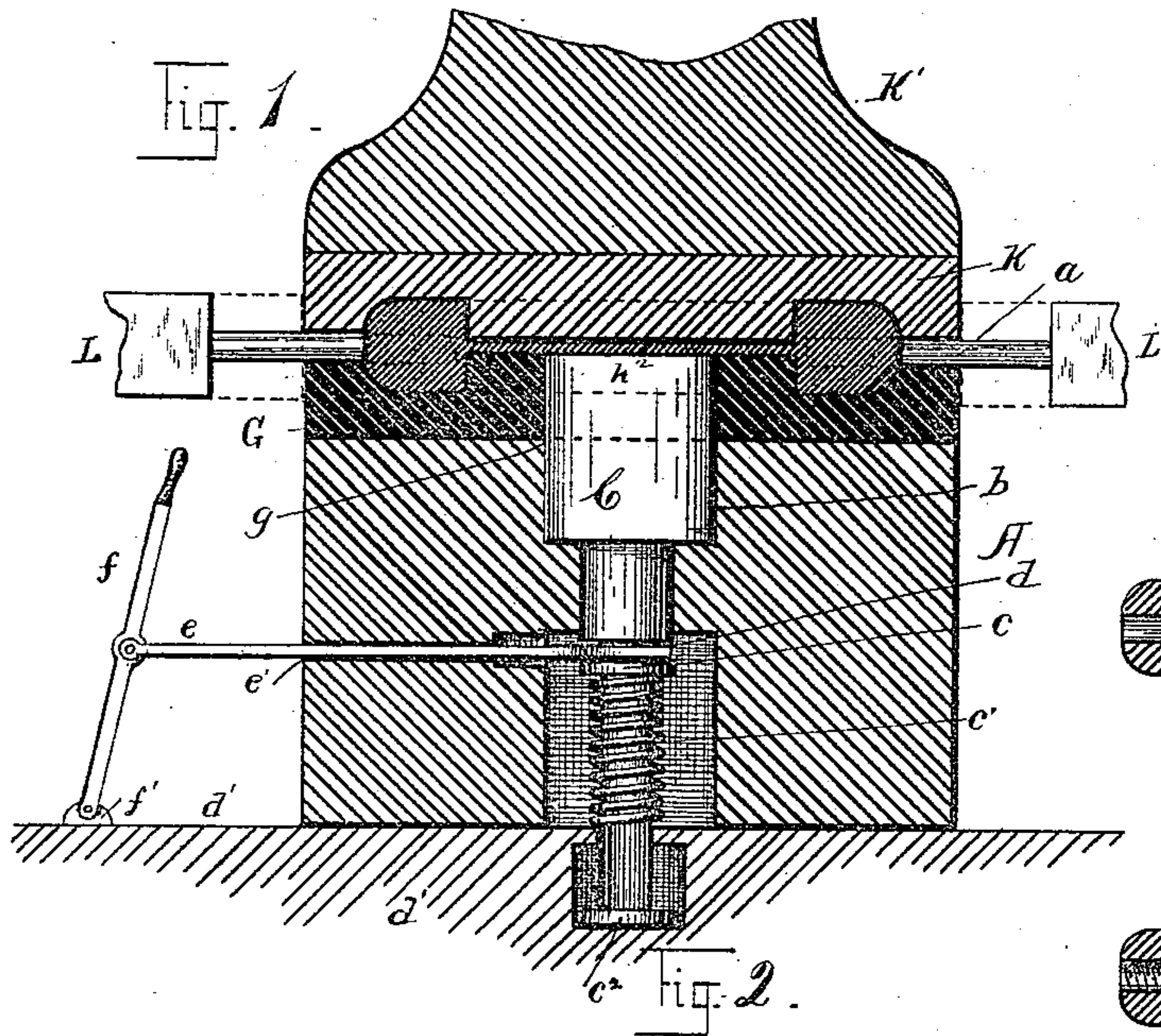


Fig. 4.

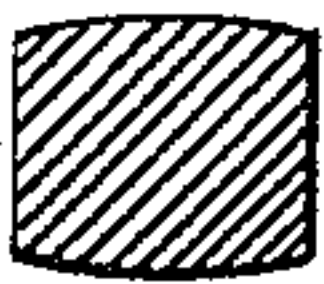


Fig. 5.

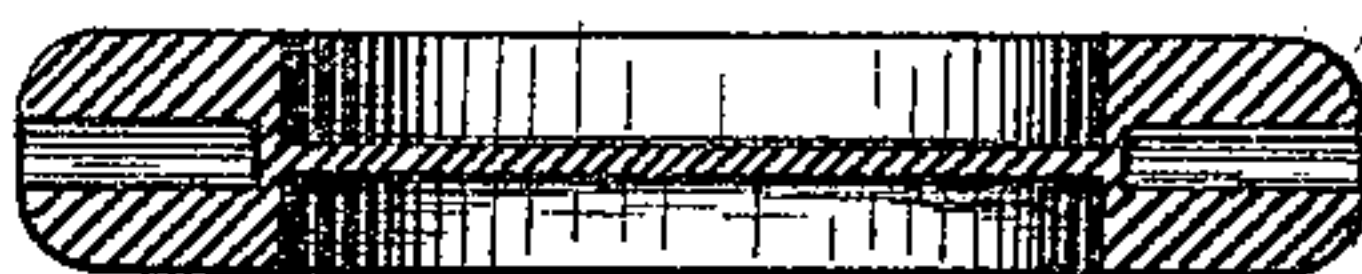


Fig. 6.

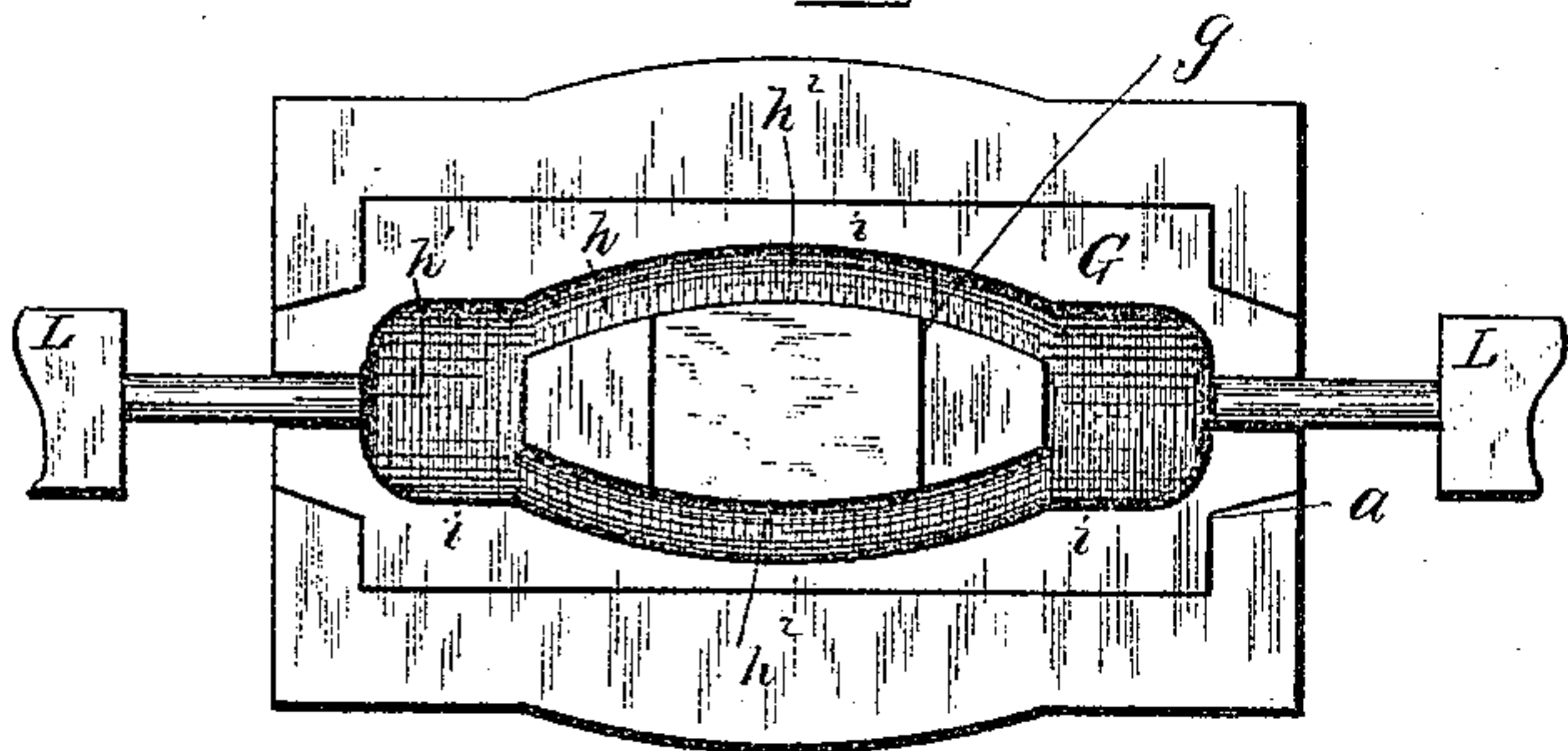
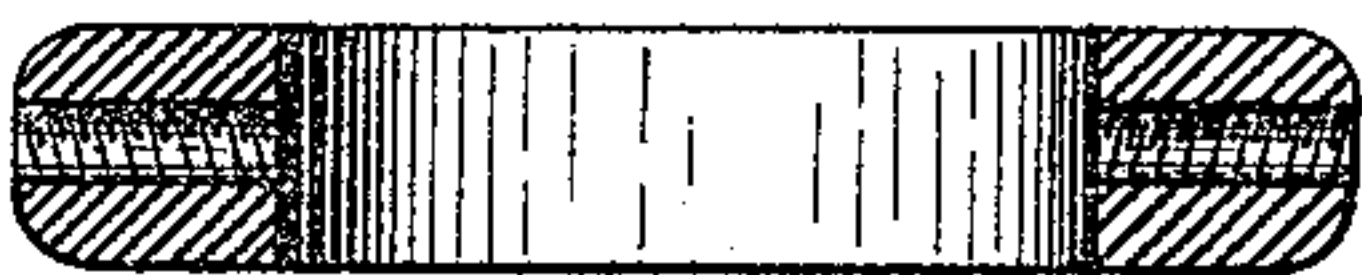
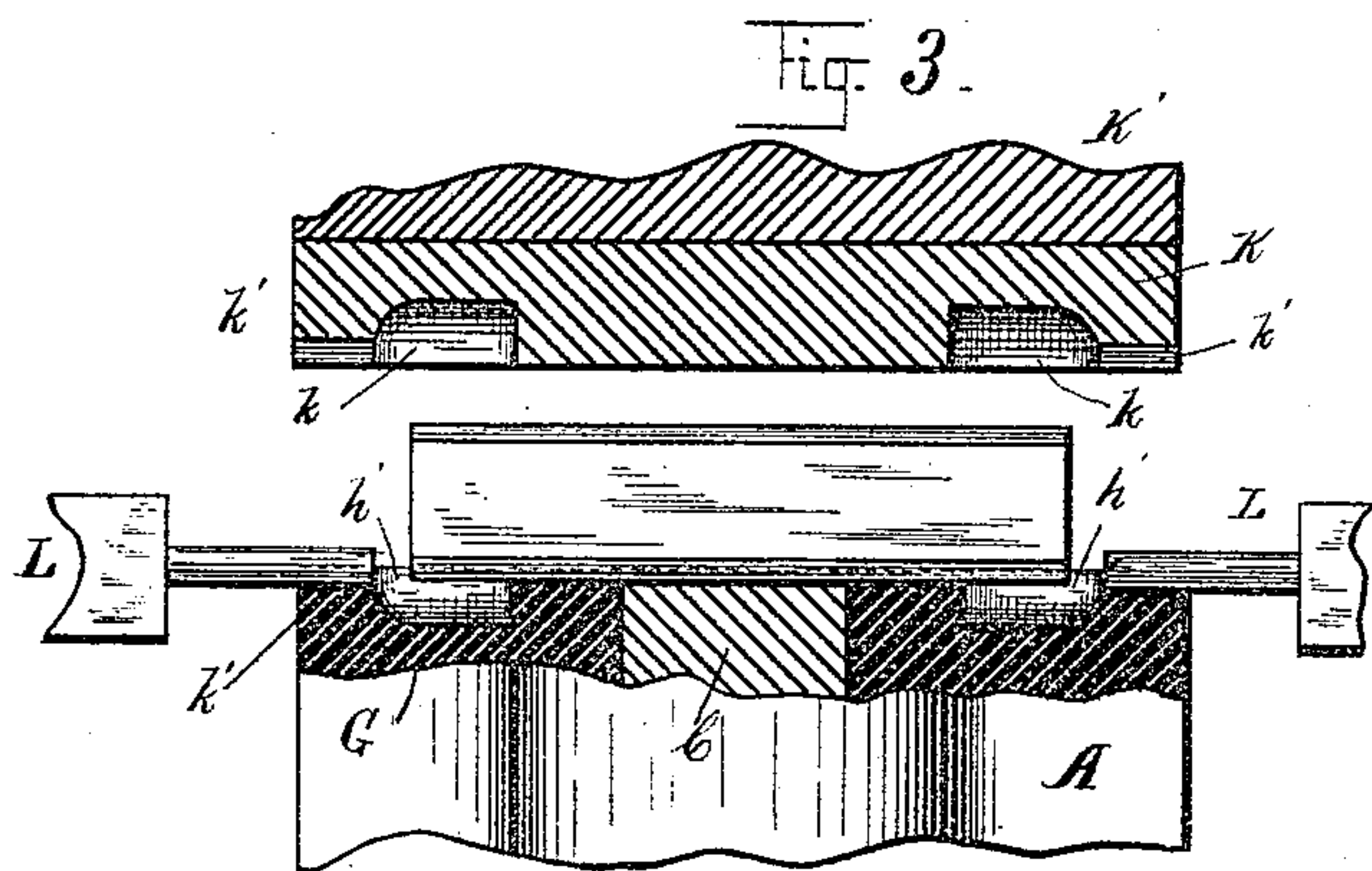
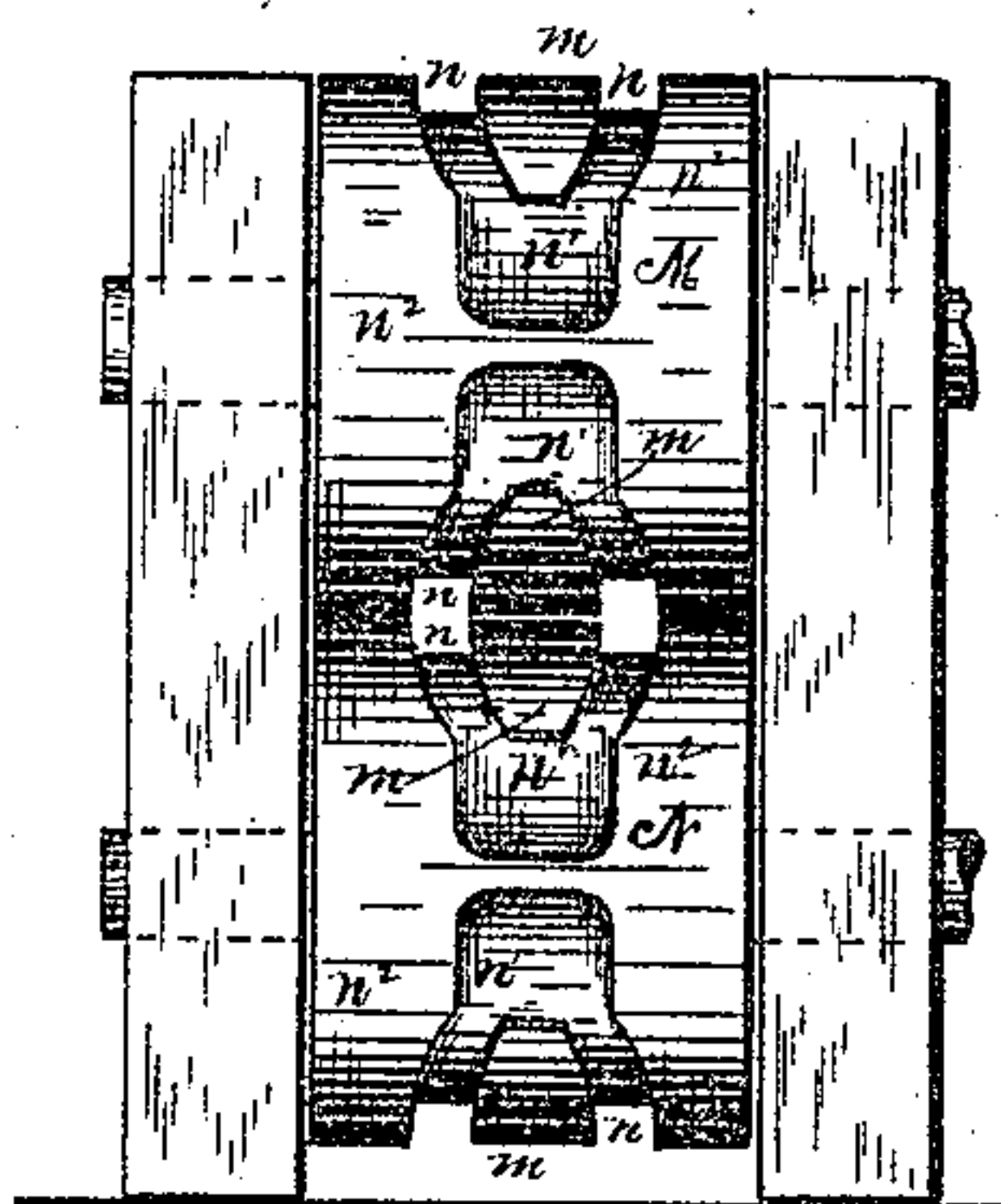


Fig. 7.



Witnesses

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UNITED STATES PATENT OFFICE.

CLIFTON B. BEACH, OF CLEVELAND, OHIO.

MACHINE FOR MAKING TURN-BUCKLE BLANKS.

SPECIFICATION forming part of Letters Patent No. 438,092, dated October 7, 1890.

Application filed December 7, 1887. Renewed October 1, 1888. Serial No. 286,923. (No model.)

To all whom it may concern:

Be it known that I, CLIFTON B. BEACH, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented certain new and useful Improvements in Turn-Buckle-Forming Machinery, of which the following is a specification, the principle of the invention being herein explained, and the best mode in which I have contemplated applying that principle so as to distinguish it from other inventions.

Referring to the drawings, Figure 1 is a longitudinal vertical section of the anvil and hammer, the ejector, clutch, and punches being shown in elevation, and a section of the turn-buckle blank being shown in position. Fig. 2 is a plan view of the anvil, die, and punches, showing the form of the die. Fig. 3 is a vertical sectional view of a portion of the hammer and anvil, the punches being shown in elevation, and a piece of metal being shown in position on the anvil ready to be operated upon. Fig. 4 is a cross-section of the metal bar before swaging. Fig. 5 is a sectional view of the turn-buckle blank when taken from the die after swaging. Fig. 6 is a sectional view of the finished turn-buckle. Fig. 7 is a front elevational view of a stand of rolls, showing a modified form of machine for forming the turn-buckle blank.

The anvil A is provided on its outer face portion with the die-opening *a* and with the vertical slot *b*. Fitting in the latter is the spring-pressed ejector C, provided at its central portion with shoulder *c*, and having bearing against this shoulder is the coil-spring *c'*, said spring having bearing at its opposite end against the mill-floor *d'*. Said ejector is also provided with annular slot *d*, and in engagement with said slot is clutch-rod *e*, that extends outwardly through horizontal opening *e'* in the anvil. Its outward extremity is pivoted to lever *f*, and this latter lever is in turn pivoted to lug *f'*, attached to the mill-floor. At its lower extremity the ejector is provided with shoulder-stop *c²*, engaging with the mill-floor and limiting the upward movement of the ejector when the clutch is released from engagement with the same. Fitting in die-opening *a* is the die G, having central slot *g*, through which the ejector passes, and pro-

vided with the elliptical groove *h* for forming the side portions of the blank and enlarged head portions *h'*, for forming the heads of the same. The faces of the ejector and die are flush with one another, the sides *h²* of the ejector forming the inner periphery of the groove *h*, while the shoulders or walls *i* of the die form the outer periphery of the same.

The hammer-face K is attached to any suitable hammer K' and is provided with openings *k*, similar in size and correspondingly located with openings *h'* in the die. Half-circular openings *k'* are also formed at either end of the die and hammer-face. Said openings *k'* in hammer-face and die register with each other when the hammer is in lowered position, as do also *k* and *h'*. Through these openings *k'* the punches L have play, said punches being connected up with any suitable reciprocating power.

The operation of forming the turn-buckles is as follows: I take a bar of iron or steel, preferably of the shape shown in section in Fig. 4, and cut it into suitable lengths to produce the desired buckle. The severed portion is then heated to a soft swaging heat and placed on the die, as shown in Fig. 3. It is then struck by the hammer and the blank is hammered and swaged into the shape shown in Fig. 5, the great pressure exerted by the hammer causing the metal to exactly conform to the shape of the die and the openings formed in the hammer-head that correspond and register with the enlarged openings *h'* of the die. When the metal is thoroughly swaged, the hammer is maintained against the working metal, while the punches L are advanced and punch the metal forward, as indicated by the dotted lines in Fig. 1. The lever *f* is then drawn back, thus freeing the clutch from engagement with the slot in the ejector. The coil-spring is then free to exert its force, which it does, forcing upward the ejector and the finished turn-buckle blank. The shoulder-stop *c²*, engaging with the mill-floor, causes the upward movement of the ejector to be suddenly arrested, and the blank is thus freed from engagement therewith. The thin web in the inner portion of the blank is then punched out, and the openings formed by punches L drilled through and tapped out

from either end, thus giving the required right and left hand thread. A portion of the web may be removed by the action of the drill.

5 In my modified machine for forming the turn-buckle I use a stand of rolls M N, each provided with suitable cams *m* and having elliptical grooves *n* and enlarged head forming depressions *n'* and outer portion *n*², flush
10 with the cams. The cams *m* cause the metal of the blank passing through the rolls to be forced out into the grooves and head-forming depressions, and a turn-buckle having a thin central web is formed similar to the blank
15 formed by the hammer and die. The blank when freed from the rolls is then drilled and the web punched out, as in my preferred manner of forming it. In this modified form of apparatus the cams *m* correspond with the
20 raised portion of the die used in my preferred form, while the grooves *n* and depressions *n'* correspond with grooves *h* and depressions *h'* of the die. The outer portion *n*² of the rolls corresponds with the face portion of the die
25 outside the groove. Therefore the rolls may be looked upon merely as modified forms of dies or swaging-tools, the lower roll corresponding to the die and the upper answering the purpose of the hammer shown in the preferred form.
30

The foregoing description and accompanying drawings set forth in detail mechanism in embodiment of my invention. Change may therefore be made therein, provided the
35 principles of construction respectively recited in the following claims are retained and employed.

I therefore particularly point out and distinctly claim as my invention—

40 1. In turn-buckle-forming machinery, a die having a groove of turn-buckle form, substantially as set forth.

2. In turn-buckle-forming machinery, a die having a groove of turn-buckle form, the face
45 inclosed by said groove formed in a right-line plane, substantially as set forth.

3. In turn-buckle-forming machinery, a die having a groove of turn-buckle form, the entire face inclosed by said groove being in projection from the latter, substantially as set
50 forth.

4. In turn-buckle-forming machinery, a die having a groove of turn-buckle form, the face inclosed by said grooves being in projection
55 from the latter and formed in a right-line plane, substantially as set forth.

5. In turn-buckle-forming machinery, the combination of two registering dies, each said die having a groove of turn-buckle form, substantially as set forth.
60

6. In turn-buckle-forming machinery, the combination of two dies, each said die having a groove of turn-buckle form, and also having the face inclosed by said groove in projection
65 from the latter, said two dies having their said grooves and inclosed projecting faces re-

spectively registering with each other, substantially as set forth.

7. In turn-buckle-forming machinery, the combination of two dies, each said die having
70 a groove of turn-buckle form, and also having the face inclosed by said groove in projection from the latter, said two grooves being of equal depth and said two groove-inclosed faces being of equal projection, substantially
75 as set forth.

8. In turn-buckle-forming machinery, the combination of two dies, each said die having a groove of turn-buckle form, and also having a swaging-face inclosed by said groove, said
80 two groove-inclosed swaging-faces being parallel with each other, substantially as set forth.

9. In turn-buckle-forming machinery, a die provided with an elliptical groove terminating in enlarged head portions, substantially
85 as set forth.

10. In turn-buckle-forming machinery, a die provided with an elliptical groove, the longitudinal end portions of said groove of enlarged formation, substantially as set forth.
90

11. In turn-buckle-forming machinery, the combination, with a die provided with an elliptical groove terminating in enlarged head portions, of a hammer-die provided with a corresponding elliptical groove having enlarged head portions, said hammer-die adapted to engage with said first die, substantially as set forth.
95

12. In turn-buckle-forming machinery, the combination of two swaging-dies, each having an elliptical projected portion in a right-line plane surrounded by a groove, which latter has its end portions of greater transverse dimensions than its central transverse portions, substantially as set forth.
105

13. In turn-buckle-forming machinery, the combination, with a die having an elliptical groove, of a second die provided with an unbroken projecting face formed in a right-line plane, said face conforming in shape and
110 practically equal in size with the face of said first die lying within said groove, said dies adapted to engage with each other, substantially as set forth.

14. In turn-buckle-forming machinery, a
115 die having a groove of turn-buckle form, the face inclosed within said groove being in projection from the latter and in a right-line plane, a portion of said face being an ejector, substantially as set forth.
120

15. In turn-buckle-forming machinery, the combination, with a die having a groove of turn-buckle form, and also having an ejector opening formed within the outline of said groove, of an ejector fitted in said opening, substantially as set forth.
125

16. In turn-buckle-forming machinery, the combination, with a die having a groove of turn-buckle form, and also having an ejector opening within the outline of said groove, of
130 an ejector fitted in said opening and having a portion of its side constituting a portion of

the inner periphery of said groove, substantially as set forth.

17. In turn-buckle-forming machinery, the combination, with a die having an elliptical groove, and also having an ejector-opening within the outline of said groove, of an ejector fitted within said opening and having its ejecting-face flush with the adjacent face of the latter, substantially as set forth.

18. In turn-buckle-forming machinery, the combination, with a die having projecting central and marginal face portions and an elliptical groove intermediate thereof, of an ejector fitted in an opening formed in said projecting central face portion, substantially as set forth.

19. In turn-buckle-forming machinery, a die having a groove of turn-buckle form, and also having a punch-groove located at one end of and parallel with the plane of said first-mentioned groove, substantially as set forth.

20. In turn-buckle-forming machinery, the combination of two dies having registering grooves of turn-buckle form, and also having registering end punch-grooves parallel with the planes of said first-described grooves, substantially as set forth.

21. In turn-buckle-forming machinery, a die provided with an elliptical groove having

enlarged end portions, and also provided with punch-openings connecting with said end portions, substantially as set forth.

22. In turn-buckle-forming machinery, a die having a groove of turn-buckle form, and also having a projecting marginal face portion provided with two punch-openings located parallel with the plane of said groove and respectively connecting with the longitudinal end portions thereof, substantially as set forth.

23. In turn-buckle-forming machinery, the combination of two dies, each said die having an elliptical groove provided with enlarged end portions, substantially as set forth.

24. In turn-buckle-forming machinery, the combination of two registering dies, each having an elliptical groove with enlarged end portions, each said die also having two punch-openings respectively connecting centrally with said end portions parallel with the plane of said groove, substantially as set forth.

In testimony that I claim the foregoing to be my invention I have hereunto set my hand this 3d day of December, A. D. 1887.

CLIFTON B. BEACH.

Witnesses:

J. B. FAY,
E. J. CLIMO.