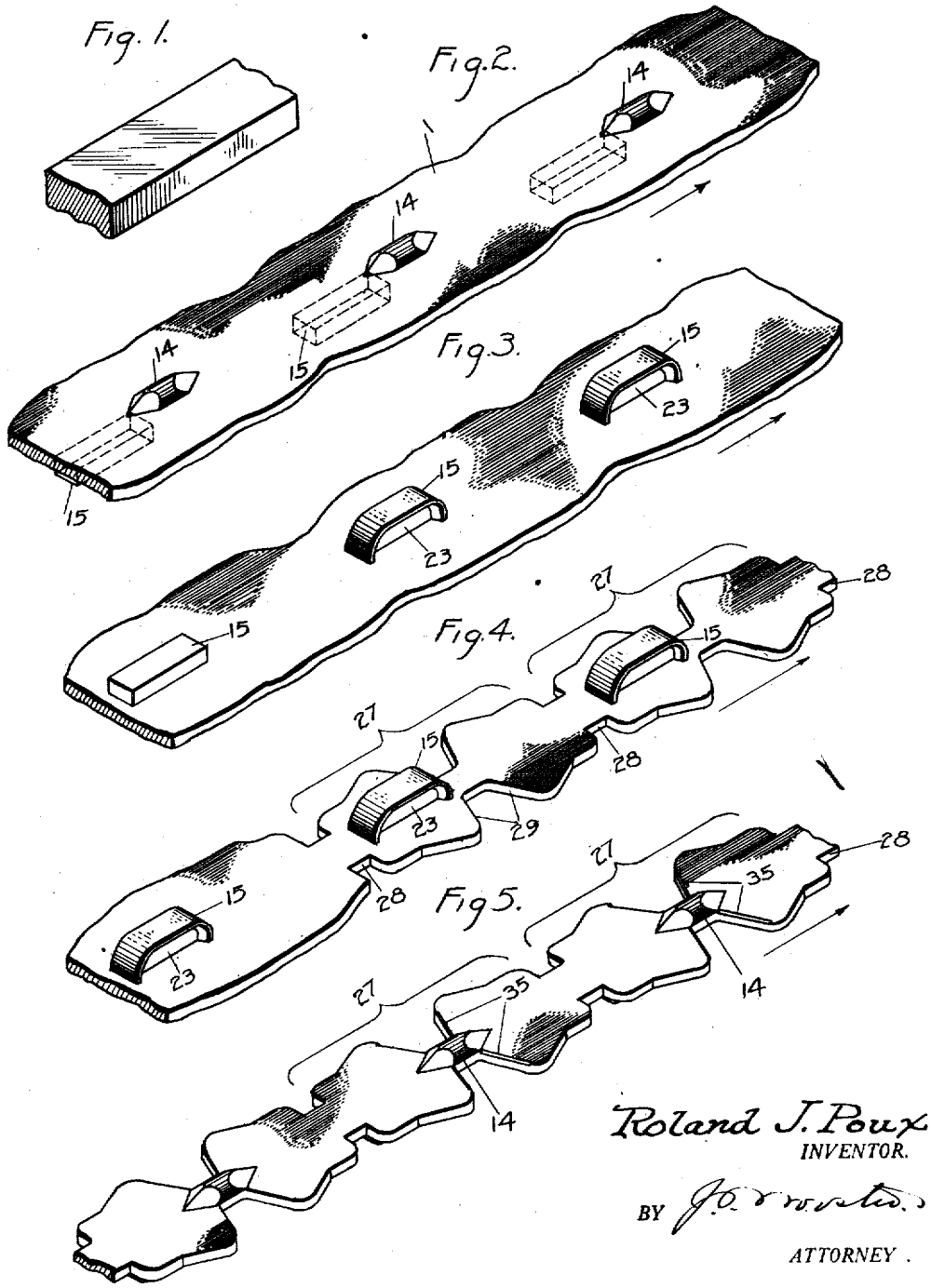
March 14, 1933. R. J. POUX 1,901,189

METHOD OF FORMING SEPARABLE FASTENER SLIDERS

Filed April 5, 1929 5 Sheets-Sheet 1



Roland J. Poux
INVENTOR.

BY J. O. Wooster

ATTORNEY.

March 14, 1933. R. J. POUX 1,901,189

METHOD OF FORMING SEPARABLE FASTENER SLIDERS

Filed April 5, 1929 5 Sheets-Sheet 2

Fig. 6.

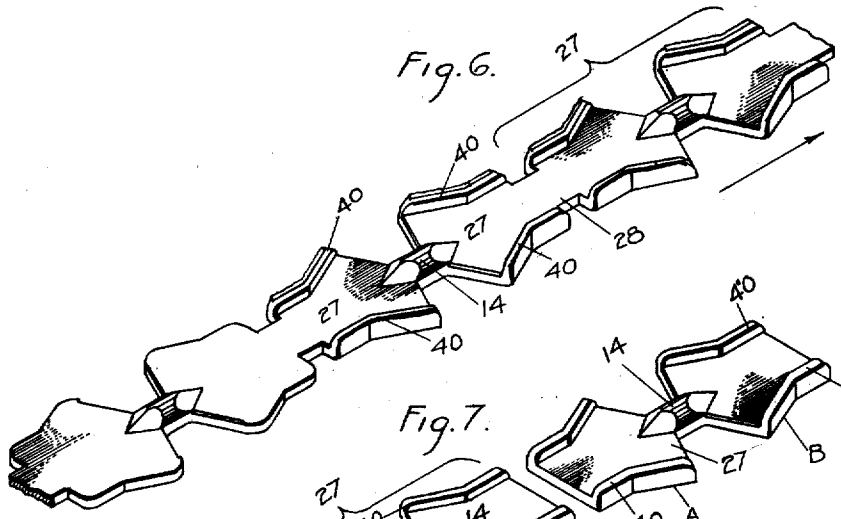


Fig. 7.

Fig. 8

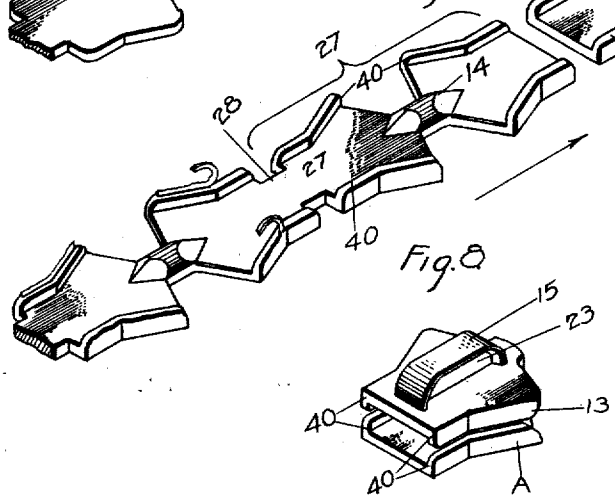
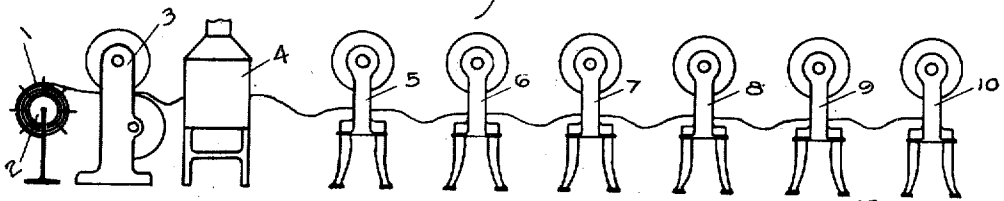


Fig. 9.



Roland J. Poux
INVENTOR.

BY J. O. Mastin
ATTORNEYS.

March 14, 1933. R. J. POUX 1,901,189

METHOD OF FORMING SEPARABLE FASTENER SLIDERS

Filed April 5, 1929 5 Sheets-Sheet 3

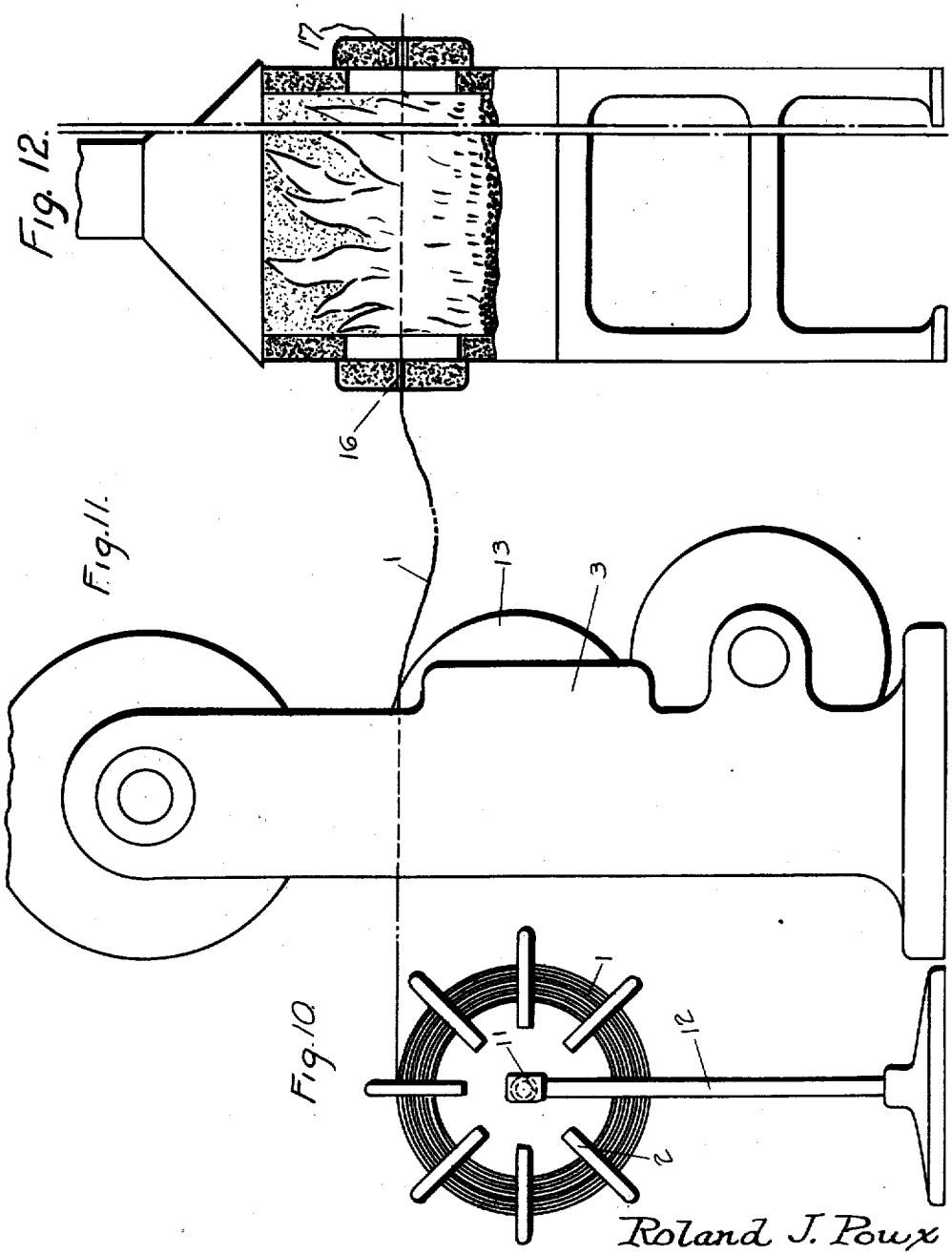


Fig. 12.

Fig. 11.

Fig. 10

Roland J. Poux
INVENTOR.

BY

ATTORNEYS.

March 14, 1933. R. J. POUX 1,901,189

METHOD OF FORMING SEPARABLE FASTENER SLIDERS

Filed April 5, 1929 5 Sheets-Sheet 4

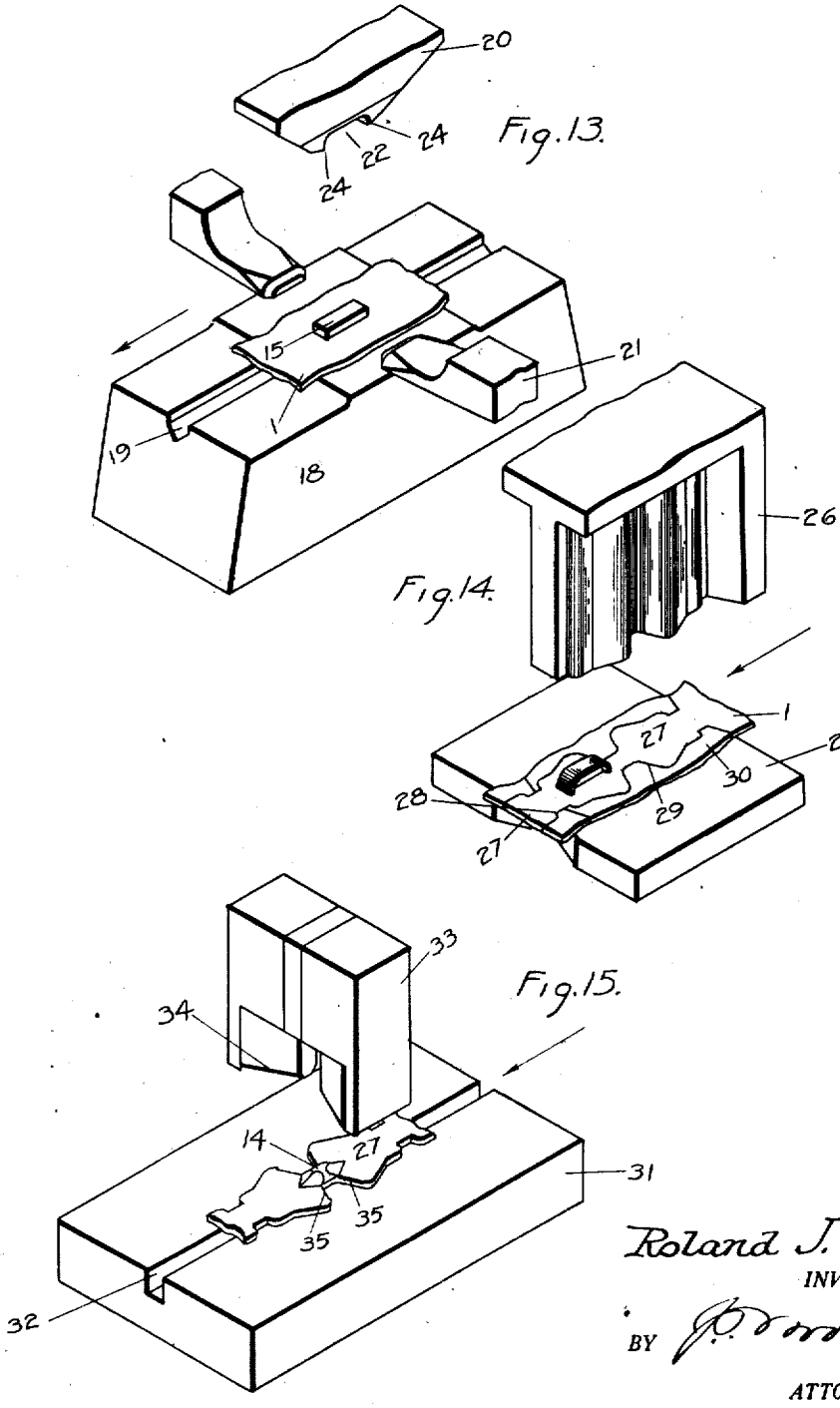


Fig. 13.

Fig. 14.

Fig. 15.

Roland J. Poux
INVENTOR.

BY

ATTORNEYS.

March 14, 1933. R. J. POUX 1,901,189

METHOD OF FORMING SEPARABLE FASTENER SLIDERS

Filed April 5, 1929 5 Sheets-Sheet 5

Fig. 16.

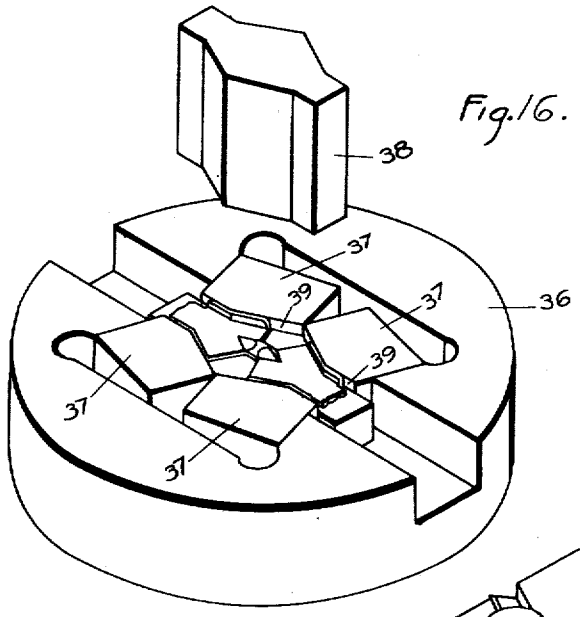


Fig. 17

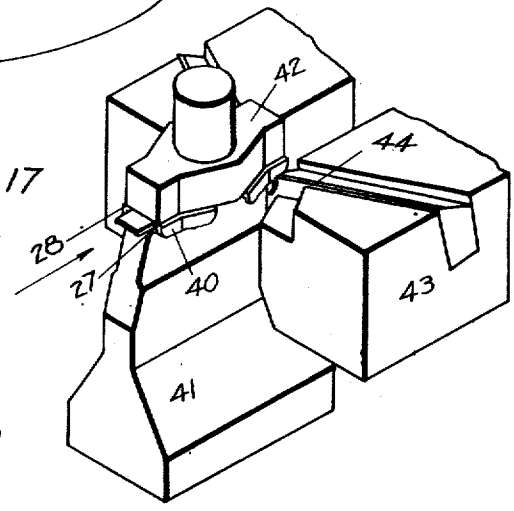
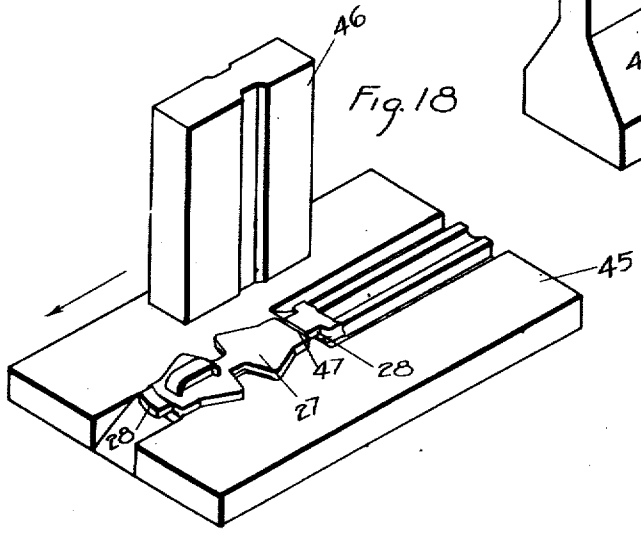


Fig. 18



Roland J. Poux
INVENTOR.

BY

ATTORNEYS.

Patented Mar. 14, 1933 1,901,189

UNITED STATES PATENT OFFICE

ROLAND J. POUX, OF MEADVILLE, PENNSYLVANIA, ASSIGNOR TO HOOKLESS FASTENER COMPANY, OF MEADVILLE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA

METHOD OF FORMING SEPARABLE FASTENER SLIDERS

Application filed April 5, 1929. Serial No. 352,793.

This invention relates to the method of forming separable fastener sliders and particularly the type of sliders shown and described in Sundback Patent No. 1,661,144 dated February 28, 1928.

The principal object of this invention is to provide a new and improved method wherein separable fastener sliders may be manufactured quickly and economically.

Another object is to provide a method of forming separable fastener sliders in a substantially continuous operation.

Another object is to provide a method of forming separable fastener sliders wherein a continuous strip of metal is fed to a plurality of forming machines whereby a number of sliders may be formed thereon while the same are connected to each other in strip form.

A further object is to provide a method of forming separable fastener sliders wherein a plurality of sliders may be formed on a continuous strip of metal by continuous successive coining, upsetting, flanging and cutting operations, in order that the sliders may be quickly and economically manufactured.

With the foregoing and other objects in view which will be apparent from the detailed description to follow, this invention consists in certain novel forming operations which will be readily understood by those skilled in the art.

In the drawings, which illustrate the present invention:

Figure 1 is a fragmentary perspective view of the strip of metal from which the sliders are to be formed;

Fig. 2 is a perspective view of a portion of the metal strip showing diamond-shaped and rectangular shaped protuberances formed thereon during the coining operation for a number of sliders.

Fig. 3 is a perspective view of a portion of the strip illustrated in Fig. 2 showing the indentations formed in the rectangular-shaped protuberances during the indenting operation;

Fig. 4 is a perspective view of a portion of the strip illustrated in Fig. 3 showing the same blanked to the contour of the sliders;

Fig. 5 is a perspective view of a portion of the strip illustrated in Fig. 4 showing certain edges thereof chamfered;

Fig. 6 is a perspective view of a portion of the strip illustrated in Fig. 5 showing the flanges formed thereon during a flange-forming operation;

Fig. 7 is a perspective view of a portion of the strip illustrated in Fig. 6 showing the flanges sheared off, and showing one of the sliders cut off from the strip;

Fig. 8 is a perspective view of one of the cut-off sliders bent into final form;

Fig. 9 is a diagrammatic side view of the several apparatuses for forming the sliders showing a continuous metal strip passing therethrough;

Fig. 10 is an enlarged side view of the strip-carrying reel illustrated in Fig. 9;

Fig. 11 is an enlarged side view of the coining press shown in Fig. 9;

Fig. 12 is an enlarged side elevation of the annealing furnace, shown partly in section;

Fig. 13 is a perspective view of the dies for forming the indentations provided in the rectangular-shaped protuberances;

Fig. 14 is a perspective view of the dies used in the blanking operation;

Fig. 15 is a perspective view of the dies used in the chamfering operation;

Fig. 16 is a perspective view of the dies used in the flange-forming operation;

Fig. 17 is a perspective view of the dies used in the flange-shearing operation;

Fig. 18 is a perspective view of the slider cut-off die.

Heretofore separable fastener sliders of the type shown and described in Sundback Patent No. 1,661,144 dated February 28th, 1928, were manufactured in accordance with the general process shown and described in my co-pending application, Serial No. 179,223, filed March 29th, 1927. In accordance with this method of manufacture, partially formed slider blanks were individually moved from one machine to another machine for performing the necessary sequence of operations, until the slider was completed. This individual handling of each slider for each forming operation required complicat-

ed handling machinery, and was very costly.

The present invention proposes an improved method of forming the sliders whereby the time of forming the same is reduced to a minimum, the machinery is greatly simplified, and the production supervised by each operator is greatly increased. Broadly stated, the present invention consists in progressively subjecting a metallic strip to a series of forming operations to progressively produce slider elements that can be severed from the strip as it leaves the last machine.

Referring to the accompanying drawings, in which like numerals refer to like parts throughout the several views, and particularly to Fig. 9 which illustrates the several machines for forming the sliders, the strip metal 1 rolled upon a reel 2 and from which the sliders are to be formed, successively passes through a coining press 3, an annealing furnace 4, an indenting press 5, a blanking press 6, a chamfering press 7, a flange forming press 8, a shearing machine 9, and finally a cut-off machine 10 where each slider is severed from the metal strip 1.

Referring to Fig. 9, a large quantity of strip stock 1 of suitable material and of the shape shown in Fig. 1 is rolled upon the reel 2 which is rotatably mounted upon a shaft 11 carried by supporting standard 12. As the metal strip 1 is unrolled, it passes through the coining press which is provided with suitable rolls 13 which flow the metal of the strip 1 to the correct thicknesses, and form spaced diamond-shaped raised portions 14 on one side and spaced rectangular lugs 15 on the other side thereof. The lugs 15, as shown in Fig. 2, are spaced the same as the raised portions 14 and are positioned slightly in advance of the raised portions 14. The coining press 3 hardens the metal of the strip 1 to such an extent that it is preferably annealed to soften it for subsequent forming operations. This is accomplished by passing the strip 1 through ports 16 and 17 formed in the walls of the annealing furnace 4 that is shown partly in section in Fig. 12. A substantially constant temperature is maintained in the furnace 4 so that the metal strip 1 leaving the same through the port 17 will be of the desired uniform softness.

The metal strip 1, as it leaves the annealing furnace 4, passes to the indenting machine 5 which is provided with the indenting apparatus illustrated in Fig. 13. This apparatus, as shown in the view, comprises a base or bed 18 having a longitudinal guide groove 19 therein for receiving the raised portions 14 on the metal strip 1 as it is moved over the bed 19, a lug clamping member 20, and dies 21. When one of the lugs 15 reaches a predetermined position over the bed 19 the clamping member 20, having an open-sided notch 22 in its lower face, automatically moves downwardly so that the bottom faces 24 of the clamp 20 engage the upper surface of the strip 1 adjacent to the end faces of the lug 15 to firmly clamp the same in place against the bed 18, and at the instant of clamping the dies 21, having ends of the desired shape, automatically and simultaneously move inwardly toward each other, striking opposite sides of the lug 15 at the same instant and upsetting the sides of the same to form the depressions 23 therein. These depressions or indentations 23, which are shown in Fig. 3, are formed to receive the pull tab (not shown) used to operate the slider.

The metal strip 1 passes from the indenting machine 5 to the blanking machine 6 which is provided with the apparatus shown in Fig. 14. This apparatus blanks the sliders to the form shown in Fig. 4 and comprises a die 25 having the correct recesses therein, and the blanking punch 26. The blanking punch 26 strikes the metal and forms the slider blank 27 defined by the contour line 29. This blanking punch 27 is so designed that it cuts away the scrap 30, leaving each blank 27 connected with the adjacent blank by a narrow strip of metal 28, the scrap 30 being carried along by the movement of the metal strip 1 and dropped out as the blank 27 clears the die 25. This completes the blanking operation.

The next operation is a chamfering operation which takes place as the metal strip 1 moves from the machine 6 to machine 7. The machine 7 is provided with the die shown in inverted position in Fig. 15 to more clearly illustrate the position of the slider blank 27. The metal strip 1, now having the appearance illustrated in Fig. 4, slides along an anvil 31 having a rectangular groove 32 which receives and guides the lugs 15. When one of the blanks 27, comprising two oppositely disposed portions interconnected by the diamond-shaped raised portion 14, reaches a predetermined position on the anvil 31, a die 33 having chamfering edges 34 moves upwardly and strikes the four sharp edges of the blank 27 adjacent the raised portion 14 and chamfers the same, forming flatted surfaces 35 thereon.

The strip 1, after it leaves the chamfering machine 7, passes to the forming machine 8 which is provided with the apparatus shown in Fig. 16. This apparatus is also shown in inverted position, and comprises a bed 36 which is provided with dies 37, and a cooperating punch 38, the shape of which is the same as the slider blank 27 but of lesser dimensions. Each slider blank 27, as it enters the forming machine 8, is guided against the die members 37 and, when it reaches a predetermined position, the punch member 38 moves upwardly and strikes the same, forc-

ing the metal into the die recesses 39 to form flanges 40 along its sides substantially as shown in Figs. 16 and 6.

The metal strip next moves to the shearing machine 9 which shaves off the rough edges of the flanges 40 and brings them to the proper height. The shearing machine 9 is provided with a supporting base 41 which each slider blank 27 straddles as it enters the machine, a clamping plunger 42, which clamps the blank 27 against the base 41, and a pair of spaced blocks 43 having knife edges 44 which move longitudinally along the blank 27 and shear off the rough edges of the flanges 40 on each side of the blank, substantially as shown in Fig. 17, so that the flanges 40 will be of the correct dimension.

The metal strip 1 then moves to the severing or cut-off machine 10. This machine, as shown in Fig. 18, is provided with a guide base 45 and cut-off punch 46. The punch 46 moves downwardly when the blank 27 reaches a predetermined position and cuts off the interconnecting metal portion 28 on the line 47 as indicated in Fig. 18, leaving the projecting connections 28 on the adjacent blank. When the adjacent blank moves into position, this portion 28 is severed from the same as well as the similar portion on the other end thereof. The finished slider blank 27 has the appearance as indicated in Fig. 7, and comprises two oppositely disposed identically shaped channeled portions A and B, interconnected by the metal of the blank and the raised diamond-shaped portion 14, the portion B being provided with the indented lug 15. The slider so formed is then bent into completed form by bending the portion B back over the portion A substantially midway between the ends of the diamond-shaped raised portion 14 so that the flanges 40 on opposite sides of the portion B face the channels 40 on the sides of the portion A substantially as shown in Fig. 8. The V-shaped channeled portions provided by the flanges 40 serve as guides for the interlocking fastener sections on which the slider is to be used, and the bent diamond-shaped portion 14 serves as a cam for locking and unlocking the fastener sections.

In the apparatus described for forming the fastener sliders, the several machines are preferably timed so that each one performs its operation on a slider blank on the strip at the same instant the others are performing operations on other blanks. In this way the metal strip 1 can be moved a certain distance and then stopped, at which time each machine performs an operation on a blank, then the strip may be moved until the next adjacent slider blank is in position to be operated on by its machine, and so on.

It is plainly evident to those skilled in the art, that fastener sliders can be produced considerably quicker and much more economically by the present invention than by previous methods, principally because of the saving of time, the saving of metal, and the elimination of manual labor. The saving in labor is a large item in the manufacture of sliders of the type herein shown, especially in quantity production. Then too, there is the safety factor. In the previous methods, where one man operated a single machine, it was necessary for the operator to place each slider in its die for forming a single operation and to remove the same when the operation was completed. These operators were continually in danger of having their fingers and hands injured by the various dies and punches. It is evident that this danger is substantially eliminated in the present invention.

It is further evident that many other advantages are gained by the use of the present invention in the manufacture of sliders for separable fasteners.

It is to be understood that numerous changes may be made in the various steps of the method described without departing from the spirit and scope of the present invention, and that it is desired to not limit the invention to the exact method herein set forth, as it is desired to claim the same broadly as well as specifically as indicated in the appended claims.

What I claim is:

1. The method of forming separable fastener sliders by a series of successive operations, which includes feeding a continuous strip of metal to a coining press for forming a plurality of spaced lugs on said strip, feeding said strip to a blanking die for blanking said strip to the shape of a series of interconnecting slider elements each of which has two flat wing portions connected by a narrow relatively thick portion, said blanks being connected in the strip, and feeding said strip to a severing machine for cutting said elements from said strip.

2. The method of forming separable fastener sliders by a series of successive operations, which includes in successively feeding a continuous strip of metal to a coining press for forming a plurality of spaced lugs on said strip, passing said strip through a furnace for annealing the same, feeding said strip to a blanking die for blanking said strip to the shape of a series of interconnected slider elements, each including a lug, and feeding said strip to a severing machine for cutting said elements from said strip.

3. The method of forming separable fastener sliders by a series of successive operations, which includes feeding a continuous strip of metal to a coining press for forming a plurality of spaced lugs on said strip, feeding said strip to a blanking die for blanking said strip to the shape of a series of interconnected slider elements, each including a lug,

feeding said strip to a press for flanging the sides of said elements, and feeding said strip to a severing machine for cutting said elements from said strip.

4. The method of forming separable fastener sliders by a series of successive operations, which includes feeding a continuous strip of metal to a coining press for forming a plurality of spaced lugs on said strip, feeding said strip to a blanking die for blanking said strip to the shape of a series of interconnected slider elements, each including a lug, feeding said strip to a press for flanging the sides of said elements, feeding said strip to a shearing machine for trimming said flanges, and feeding said strip to a severing machine for cutting said elements from said strip.

5. The method of forming separable fastener sliders by a series of successive operations, which includes feeding a continuous strip of metal to a coining press for forming a plurality of spaced lugs on said strip, feeding said strip to an indenting die for forming depressions in the sides of said lugs, feeding said strip to a blanking die for blanking said strip to the shape of a series of interconnected slider elements, each including a lug, and feeding said strip to a severing machine for cutting said elements from said strip.

6. The method of forming separable fastener sliders by a series of successive operations, which includes successively feeding a continuous strip of metal to a coining press for forming a series of spaced lugs on one side of said strip, and forming a series of spaced diamond-shaped raised portions on the other side of said strip, feeding said strip to a blanking die for blanking said strip to the shape of a series of interconnected slider elements, each including a lug and a raised portion, and feeding said strip to a severing machine for cutting said elements from said strip.

7. The method of forming separable fastener sliders by a series of successive operations, which includes progressively feeding a continuous strip of metal to a blanking machine for forming a series of pairs of connected slider elements on said strip, feeding said strip to a chamfering machine for chamfering certain edges of said pairs of elements, feeding said strip to a forming machine for flanging the sides of said pairs of elements, feeding said strip to a shearing machine for trimming the edges of said flanges and feeding said strip to a cutting machine for severing connected pairs of said elements from said strip.

8. The method of forming separable fastener sliders by a series of successive operations, which includes progressively passing a continuous strip of metal through a furnace for annealing the same, feeding said strip to a blanking machine for forming a series of pairs of connected slider elements on said strip, feeding said strip to a chamfering machine for chamfering certain edges of said pairs of elements, feeding said strip to a forming machine for flanging the sides of said pairs of elements, feeding said strip to a shearing machine for trimming the edges of said flanges and feeding said strip to a cutting machine for severing connected pairs of said elements from said strip.

9. The method of forming separable fastener sliders by a series of successive operations, which includes progressively feeding a continuous strip of metal to a coining press for forming a series of spaced lugs on one side thereof and a series of spaced diamond-shaped raised portions on the other side thereof, passing said strip through a furnace for annealing the same, feeding said strip to an indenting machine for forming depressions in the sides of said lugs, feeding said strip to a blanking machine for forming a series of pairs of slider elements, each pair including a lug and being interconnected by a diamond-shaped raised portion, feeding said strip to a chamfering machine for chamfering certain edges of said pairs of elements, feeding said strip to a forming machine for flanging the sides of said pairs of elements, feeding said strip to a shearing machine for trimming the edges of said flanges and feeding said strip to a cutting machine for severing connected pairs of said elements from said strip.

10. In a method of forming separable fastener sliders, the steps consisting of forming a series of connected slider blanks each of which has flat wing portions connected by a narrow relatively thick portion in strip form bending up flanges on the edges of said blanks while in strip form, severing the blanks apart and bending each blank to make a completed slider.

11. The method of forming separable fastener sliders by a series of successive operations which comprises forming a series of connected slider blanks in a metal strip each of said blanks having two flat wing portions, each of which is wider at one end than at the other end, and connected by a relatively narrow neck portion, said slider blanks being connected by relatively narrow integral portions of the strip, bending up flanges on the side edges of each of said wing portions of said blanks while so connected, cutting out said integral connecting portions to separate said blanks, and bending the neck portion of each blank until said wings are substantially parallel.

12. The method of forming separable fastener sliders by a series of successive operations which comprises forming a series of connected slider blanks in a metal strip, each of said blanks having two flat wing portions, each of which is wider at one end than at the

other end, and connected by a relatively narrow neck portion, said slider blanks being connected by relatively narrow integral portions of the strip, bending up flanges on the side edges of each of said wing portions of said blanks while so connected, and trimming said flanges while said blanks are connected in the strip.

In testimony whereof I affix my signature.

ROLAND J. POUX.

CERTIFICATE OF CORRECTION.

Patent No. 1,901,189. March 14, 1933.

ROLAND J. POUX.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, line 113, claim 2, strike out the word "in"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 23rd day of May, A. D. 1933.

M. J. Moore.
Acting Commissioner of Patents.

(Seal)

other end, and connected by a relatively narrow neck portion, said slider blanks being connected by relatively narrow integral portions of the strip, bending up flanges on the side edges of each of said wing portions of said blanks while so connected, and trimming said flanges while said blanks are connected in the strip.

In testimony whereof I affix my signature.

ROLAND J. POUX.

CERTIFICATE OF CORRECTION.

Patent No. 1,901,189. March 14, 1933.

ROLAND J. POUX.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, line 113, claim 2, strike out the word "in"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 23rd day of May, A. D. 1933.

M. J. Moore.
Acting Commissioner of Patents.

(Seal)