Nov. 2, 1926. 1,605,241

H. G. KELLOGG

METHOD OF FORMING WINDOW GLASS CHANNELS

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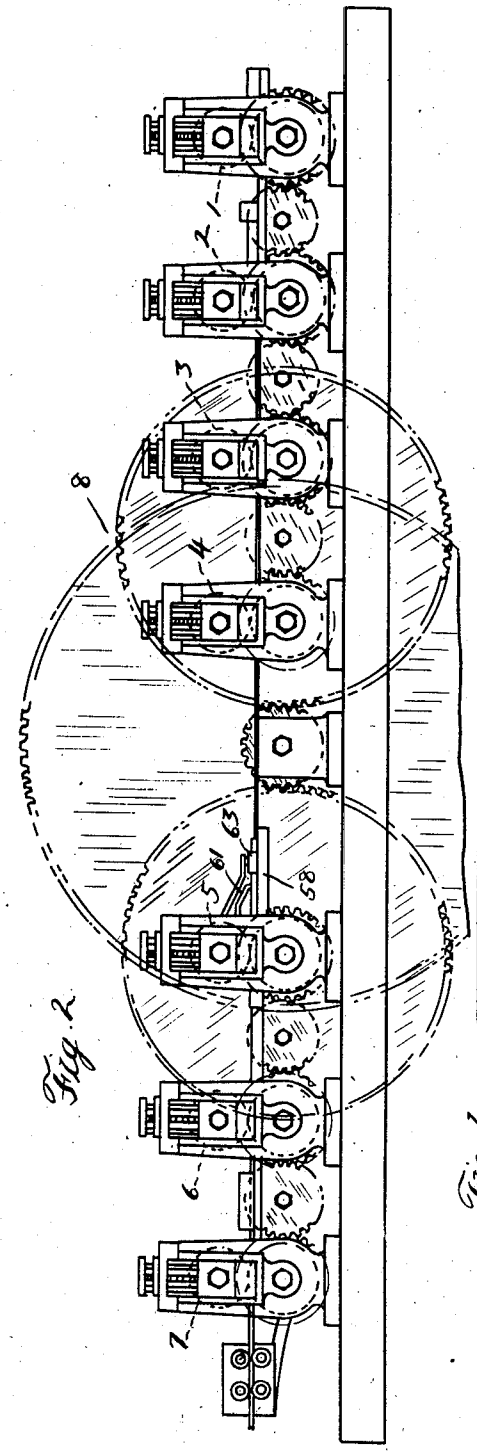


Fig. 2

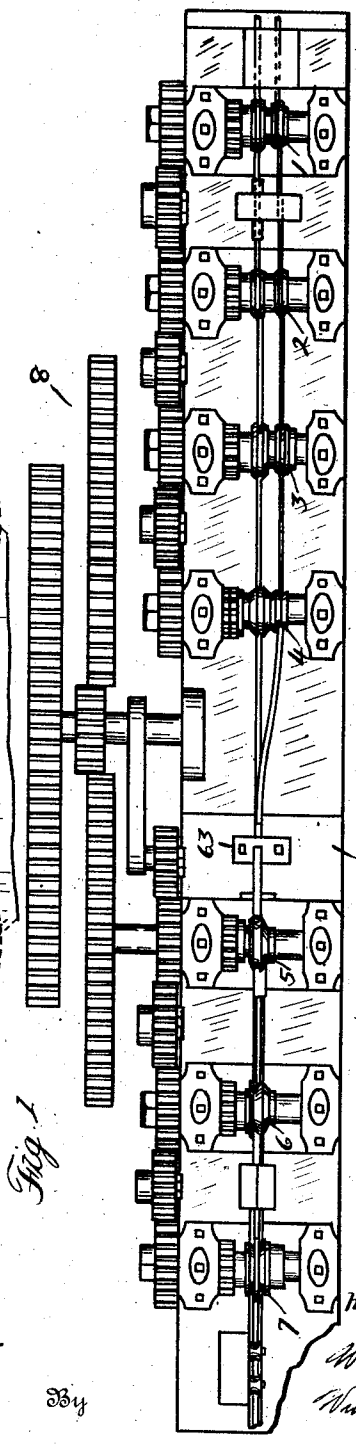


Fig. 1

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Fig. 3.

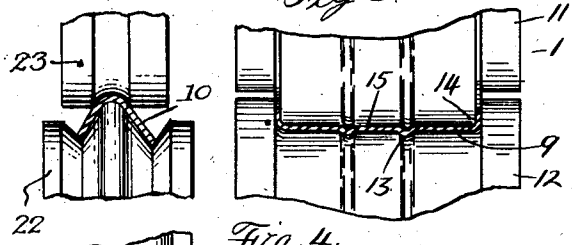


Fig. 4.

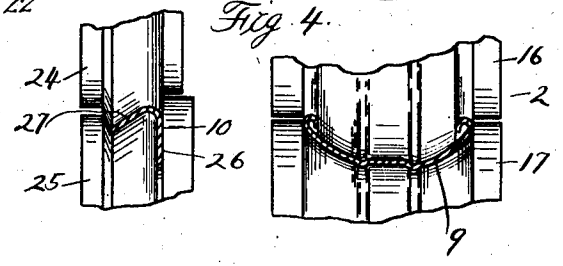


Fig. 5.

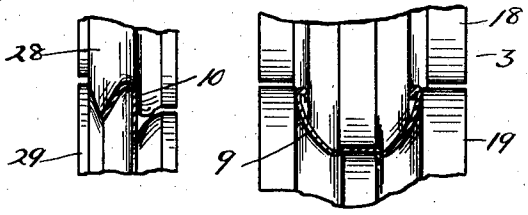


Fig. 6.

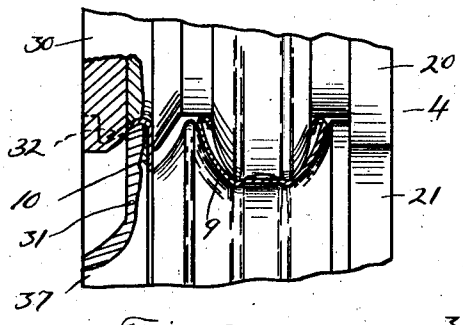


Fig. 7.

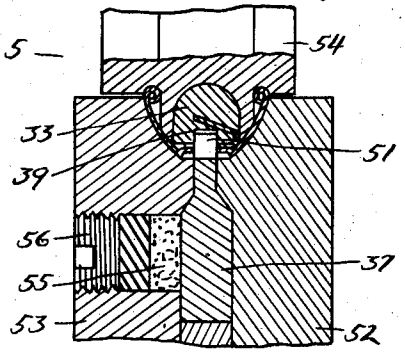


Fig. 8.

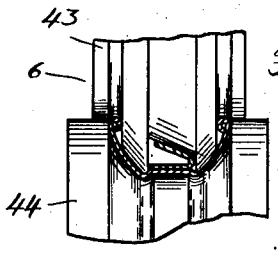


Fig. 9.

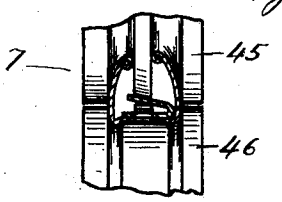
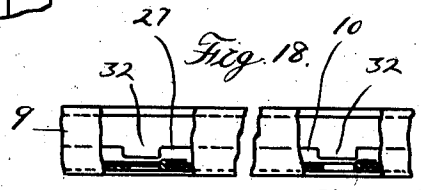


Fig. 18.



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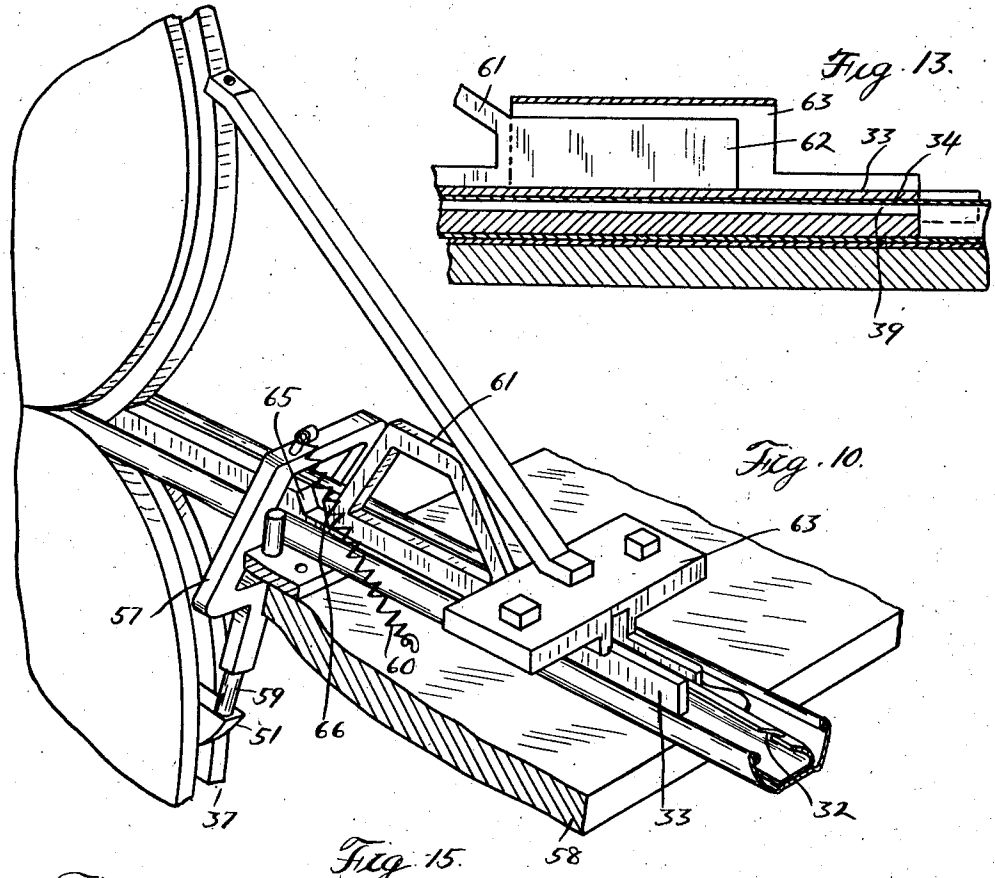


Fig. 10.

Fig. 13.

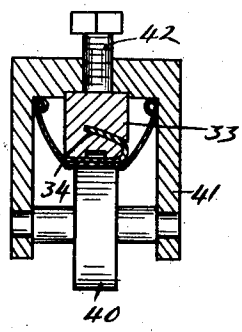


Fig. 17.

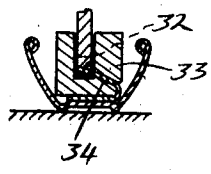


Fig. 15.

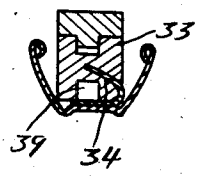


Fig. 16.

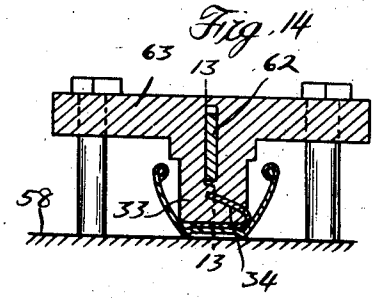


Fig. 14.

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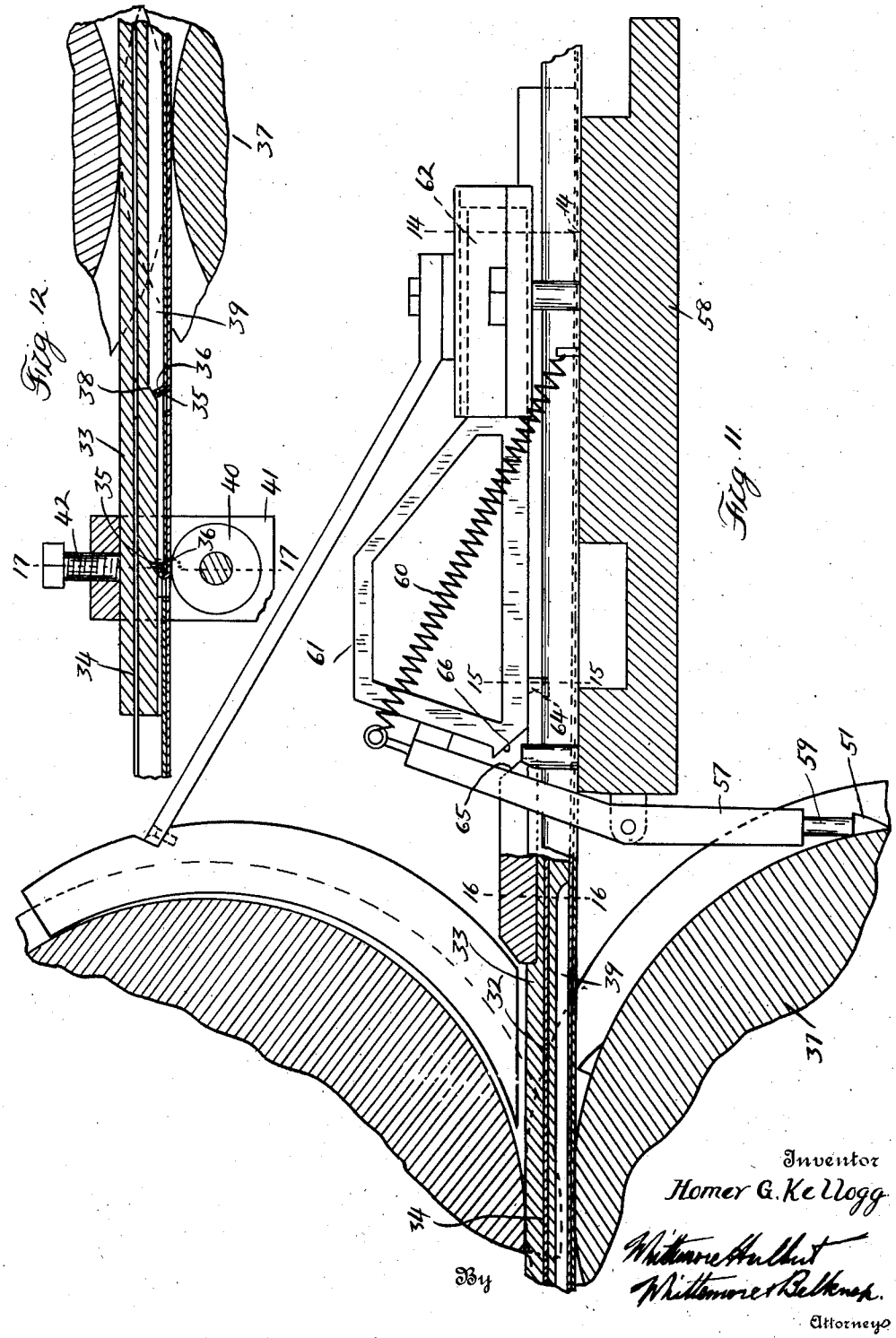
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H. G. KELLOGG

METHOD OF FORMING WINDOW GLASS CHANNELS

Filed Dec. 17, 1923 4 Sheets-Sheet 4



Patented Nov. 2, 1926. 1,605,241

UNITED STATES PATENT OFFICE.

HOMER G. KELLOGG, OF DETROIT, MICHIGAN, ASSIGNOR TO MOTOR PRODUCTS CORPORATION, OF DETROIT, MICHIGAN, A CORPORATION OF NEW YORK.

METHOD OF FORMING WINDOW-GLASS CHANNELS.

Application filed December 17, 1923. Serial No. 681,299.

The invention relates to the manufacture of channels and particularly metallic window-glass channels consisting of an outer channel-shaped strip and an inner V-shaped strip within the outer channel-shaped strip. The main idea embodied in the invention is the forming of a window-glass channel by one continuous operation, decreasing the cost of manufacture. Another feature is the fashioning of a pair of advancing flat metallic strips or ribbons, and the nesting and securing of these strips to each other during their advancement. Further objects of the invention reside in the novel features as more fully hereinafter set forth.

In the drawings:

Figure 1 is a plan view of a machine embodying my invention;

Fig. 2 is a side elevation thereof;

Figs. 3, 4, 5, 6, 7, 8, and 9 are sections through portions of the successive sets of rolls from front to rear of the machine;

Fig. 10 is a perspective view of the device for securing the strips to each other;

Figs. 11 and 12 are longitudinal sectional elevations of the front and rear portions thereof;

Fig. 13 is a longitudinal cross section through part of the front portion thereof;

Figs. 14, 15 and 16 are cross sections on the lines 14—14, 15—15 and 16—16 of Fig. 11;

Fig. 17 is a cross section on the line 17—17 of Fig. 12; and

Fig. 18 is a side elevation, partly in section, of a portion of the window-glass channel formed in the machine.

In general the window-glass channel is formed from a pair of flat metallic strips or ribbons of indeterminate length which are continuously advanced, and during their advancement are fashioned, nested, and secured to each other.

Figs. 1 and 2 disclose a machine for carrying out my method in which 1, 2, 3, 4, 5, 6, and 7 represent successive sets of rolls driven in timed relation to each other through the series of intermeshing gears 8.

Flat metalilc strips or ribbons 9 and 10 coiled to form reels rotatably mounted in advance of the machine are continuously advanced through the machine, and each strip passes between a pair of cooperating upper and lower rolls forming parts of the sets of rolls 1, 2, 3, and 4.

The strip 9 first passes between the upper and lower cooperating rolls 11 and 12 of the first set of rolls 1, which form longitudinally extending beads 13 near its middle portion and upturn the edge portions 14. The portion 15 of the strip intermediate the longitudinally extending beads 13 forms the base of the completely fashioned strip. Upon leaving the rolls 11 and 12, the strip next passes between the upper and lower cooperating rolls 16 and 17 of the set of rolls 2, which concave the same upwardly and at the same time return bend the edge portions 14. Then the strip passes between the upper and lower cooperating rolls 18 and 19 of the set of rolls 3, which bend the portions of the strip outside of the longitudinally extending beads 13 upwardly to a greater extent and at the same time bend the flanged edges 14 further downwardly. After passing between the rolls 18 and 19, the strip 9 passes between the upper and lower cooperating rolls 20 and 21 of the set of rolls 4, which bend the portions of the strip outside of the beads 13 further upwardly.

The strip 10 first passes between the upper and lower cooperating rolls 22 and 23 of the first set of rolls 1, which form the strip with upwardly diverging portions. The strip then passes between the upper and lower cooperating rolls 24 and 25 of the set of rolls 2, which operate upon the strip to form the downwardly extending portion 26 and the laterally and downwardly inclined portion 27 of the strip, the portion 26 forming the base of the completely fashioned strip, and the laterally and downwardly inclined portion 27 forming the yieldable-window-glass engaging portion of the strip. After passing between the rolls 24 and 25 the strip 10 passes between the upper and lower cooperating rolls 28 and 29 of the set of rolls 3, which bend the laterally and downwardly inclined portion 27 of the strip downwardly to a greater extent. The strip then passes between the upper and lower cooperating rolls 30 and 31 of the set of rolls 4, which cut out portions of the laterally and downwardly inclined portion 27 of the strip, leaving open ended notches 32 longitudinally spaced along the strip.

Upon leaving the set of rolls 4, the strips 9 and 10 are converged, and the strip 10 is rotated through an angle of 90° and

nested within the strip 9 with its base 26 adjacent to and above the base 15 of the strip 9.

For guiding the strips 9 and 10 there is the mandrel 33 which is embraced by the strip 9 and which has the longitudinally extending inclined slot 34 which is slidably engaged in by the notched portion or yieldable window-glass portion 27 of the strip 10. During the advancement of the strips 9 and 10 along the mandrel, their bases 15 and 26 respectively have struck upwardly therefrom the securing tongues 35 and 36 by means of the shearing roll 37 which forms a part of the set of rolls 5. Upon continued advancement of the strips, the struck up tongues 35 and 36 are bent back upon the bases of the strips by means of the shoulder 38 in rear of the set of rolls 5 and forming the rear end of the slot 39 which extends longitudinally at the bottom of the mandrel.

After having been bent back upon the bases of the strips the tongues are then crimped by contacting with the bottom of the mandrel at its rear end. This is secured by means of the roll 40 mounted in the yoke 41 below the bases of the strips and held tightly there-against by means of the set screw 42 engaging the top of the yoke and abutting against the top of the mandrel 33.

Upon leaving the mandrel the strips pass successively through the sets of rolls 6 and 7, which comprise respectively the pair of cooperating upper and lower rolls 43 and 44 and the pair of cooperating upper and lower rolls 45 and 46, which operate upon both the strips 9 and 10 to fashion the same to the desired final form. The pair of rolls 45 and 46 in particular do most of the fashioning of the strips, these rolls cooperating to bend the notched portion 27 of the strip 10 downwardly toward its base and to bend the portions of the strip 9 outside of the longitudinal beads 13 toward each other to complete the channel.

It is essential that the tongues 35 and 36, struck upwardly from the bases of the strips 9 and 10, respectively, be so located that the openings in the bases formed by striking up the tongues register with the notches 32 in the notched portion 27 of the strip 10, so that the means for securing the completed window-glass channel to the frame may be readily inserted through the notches 32 and extend through the openings in the bases. As shown, the striking up of the tongues is accomplished by the shearing projections or teeth 51 upon the shearing roll 37 equally spaced about its periphery, and the controlling of the operation of the shearing roll is accomplished by mechanism operated by the advancement of the strips.

As shown particularly in Fig. 7, the shearing roll 37 is frictionally driven, it being located between the sections 52 and 53 forming the lower roll of the set of rolls 5, 54 being the upper roll of this set. 55 is a driving member formed of suitable material which is held against one side of the shearing roll 37 by means of the set screw 56 threaded in the section 53. The shearing roll 37 is held from rotation by the yoke 57 pivotally mounted upon the table 58 to which the mandrel 33 is secured. The yoke 57 has the depending projection 59 engageable with a shearing projection or tooth 51 and embraces the mandrel 33 and is yieldably held so that its depending projection will be in the path of the shearing projection or tooth by means of the coil spring 60 connected to the upper end of the yoke and to the table 58. The yoke is actuated to release the shearing roll 37 by means of the release member 61 slidably engaging in a longitudinally extending slot in the top of the mandrel and having a stem 62 slidably engaging in the block 63, with which the mandrel is preferably integral. The release member 61 has the depending projection 64 which is adapted to engage in the notches 32 in the portion 27 of the strip 10 by gravity, so that upon the advancement of the strips the release member will also be advanced. This advancement of the release member is continued until its rear end has engaged the yoke 57 to swing the same so that its depending projection 59 disengages from the shearing projection or tooth 51 of the shearing roll 37. Then the depending projection 64 of the release member is disengaged from the notch in the strip 10 by means of the cam 65 upon the mandrel, which is engaged by the inclined face 66 upon the release member. The parts are so located and the rate of rotation of the shearing roll and rate of advancement of the strip also is such that when the shearing roll has been released one of its shearing projections or teeth will strike up the tongues in the bases of the strips so that the opening formed by striking up these tongues will register with a notch in the strip 10. After the release member has been disengaged from the strip 10 it is returned to its normal position by means of the yoke 57 through action of the coil spring 60, this yoke also being returned to its normal position where its depending projection 59 will engage a succeeding projection or tooth 51 of the shearing roll to hold the latter from rotation. When the release member has been returned to its normal position it will again be in position to drop by gravity into the succeeding notch 32 of the strip 10, after which the cycle of operations is repeated.

While I have used the term "channel" throughout the description, the invention in its broader aspects is not limited to a member having a strip of true channel-shaped

section but applies to shapes or moldings having nested strips, neither of which are necessarily of true channel-shaped section.

From the above description it will be readily seen that a completed channel strip, shape or molding comprising an outer member and an inner member is formed from a pair of flat metallic strips or ribbons during their advancement, which in the present instance is continuous.

What I claim as my invention is:

1. In the method of forming a channel or the like, the individual fashioning of substantially V-shaped and channel-shaped strips during their advancement and the nesting of the strips during advancement with the base of the V-shaped strip adjacent the base of the channel-shaped strip.

2. In the method of forming a channel, shape, or molding, the fashioning of a plurality of strips during their advancement, the effecting of the engagement of the strips with each other during their advancement with the bases thereof adjacent, and the securing of the adjacent portions of the strips to each other during the advancement of the strips.

3. In the method of forming a channel or the like, the advancement of a plurality of strips, and the fashioning, nesting, and securing at longitudinally spaced points of the strips during their advancement.

4. In the method of forming a channel or the like, the fashioning of a plurality of strips during their advancement, the forming of apertures in one of the strips, the nesting of the strips with the apertured strip within another strip, and the striking out of securing tongues in adjacent portions of the strips to form openings in the adjacent portions of the strips registering with the apertures in the inner strip.

5. In the method of forming a channel or the like, the fashioning of a plurality of strips during their advancement, the nesting of the strips, the securing of adjacent portions of the strips to each other at longitudinally spaced points, and the controlling of the longitudinal spacing by the advancement of the strips.

6. In the method of forming a window-glass channel or the like, the advancing of a pair of flat metallic strips, and during their advancement, the fashioning of the strips to form bases, the forming of apertures in one of the strips, the nesting of the apertured strip within the other strip, the striking out of securing portions in the bases of the strips and the formation of openings, and the controlling of the striking-out of the securing portions by the advancement of the apertured strip, whereby the openings formed in the bases of the strips register with the apertures formed in the apertured strip.

7. In the method of forming a channel or the like, the guiding of a pair of nested inner and outer strips, having adjacent bases, the striking-out of securing tongues in the bases of the strips, and the controlling of the striking-out of the tongues by the advancement of the strips and locations of previously formed notches in the inner strip.

8. In the method of forming a channel or the like, the guiding of a pair of nested inner and outer strips having adjacent bases, the striking-out of securing tongues in the bases of the strips, the controlling of the striking-out of the tongues by the advancement of the strips and locations of notches previously formed in an inclined yieldable glass-engaging portion of the inner strip, and the bending of the securing tongues upon the bases of the strips.

9. In the method of forming a channel or the like, the guiding of a pair of nested inner and outer strips having adjacent bases, the striking-out of securing tongues in the bases of the strips, the controlling of the striking-out of the tongues by the advancement of the strips and locations of notches previously formed in the inner strip, the bending of the securing tongues upon the bases of the strips, and the crimping of the bent-over tongues.

10. In the method of forming a channel or the like, the fashioning of a pair of strips during their advancement, the forming of apertures in one of the strips, the nesting of the strips with the apertured strip within the other, the striking-out of adjacent portions of the nested strips, and the controlling of the striking-out to form apertures registering with those in the apertured strip.

11. In the method of forming a channel or the like, the fashioning of a plurality of strips during their advancement, the forming of apertures in one of the strips, and the forming of securing portions in adjacent portions of the strips to form openings registering with the apertures in the apertured strip.

12. In the method of forming a channel or the like, the fashioning of a plurality of strips during their advancement, the forming of apertures in one of the strips, the nesting of the strips, and the striking-out of securing tongues in adjacent portions of the strips to form openings in the adjacent portions of the strips registering with the apertures in the apertured strip.

In testimony whereof I affix my signature.

HOMER G. KELLOGG.