

March 10, 1925.

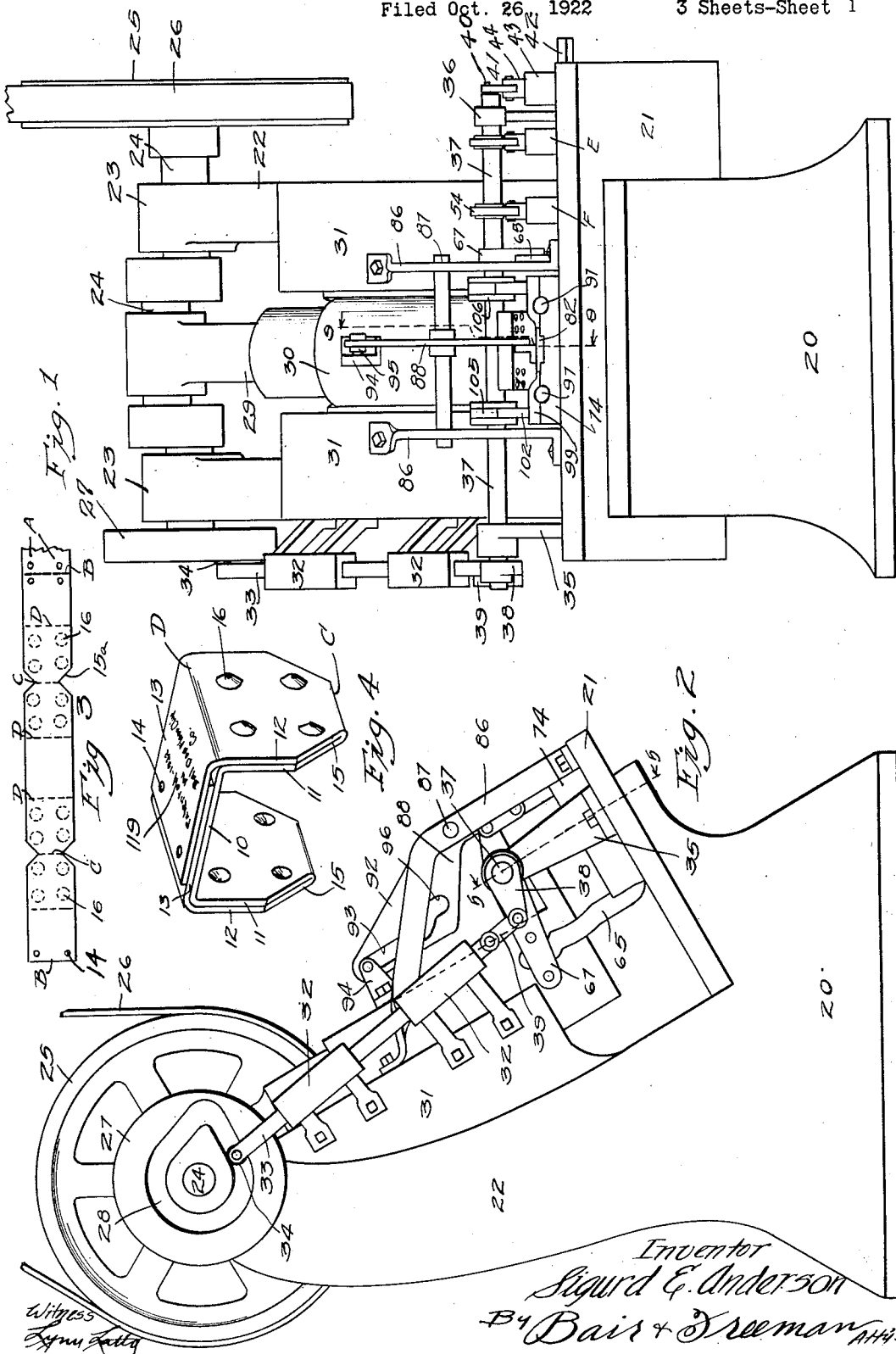
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S. E. ANDERSON

FLOOR CLIP MAKING MACHINE

Filed Oct. 26, 1922

3 Sheets-Sheet 1



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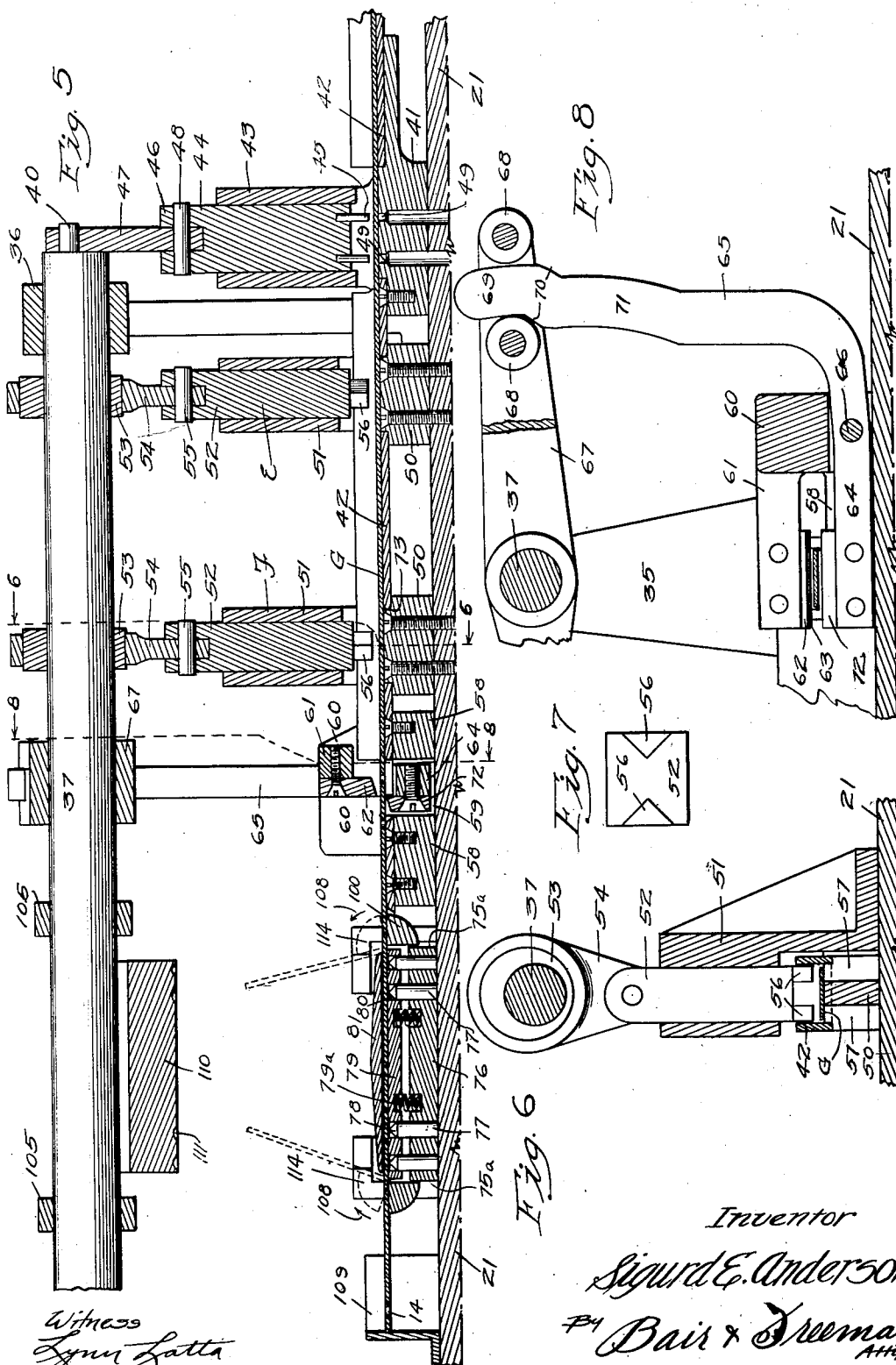
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3 Sheets-Sheet 2



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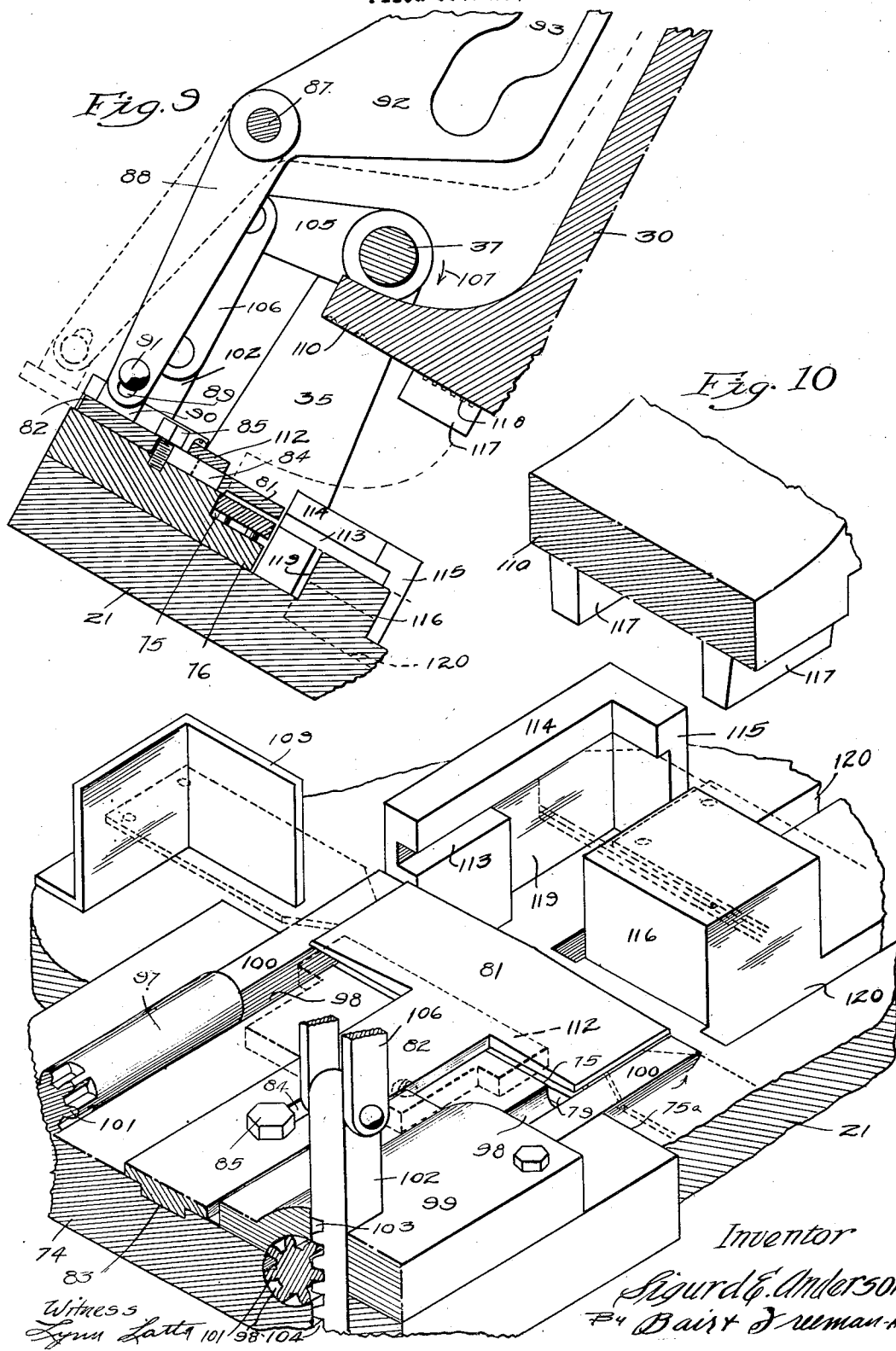
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3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE.

SIGURD E. ANDERSON, OF DES MOINES, IOWA.

FLOOR-CLIP-MAKING MACHINE.

Application filed October 26, 1922. Serial No. 597,091.

To all whom it may concern:

Be it known that I, SIGURD E. ANDERSON, a citizen of the United States, and a resident of Des Moines, in the county of Polk and State of Iowa, have invented a certain new and useful Floor-Clip-Making Machine, of which the following is a specification.

The object of my invention is to provide a machine for making floor clips such as are used for spacing and supporting in place the joists or binder strips used as a foundation for floors in buildings and houses.

More particularly, my object is to provide a machine for making clips of the type illustrated and described in the prior Patent No. 1,381,740, issued June 14, 1921 to Clyde W. Prickett.

A further object is to provide a machine wherein a long strip may be fed into the machine and cut into suitable lengths and perforated at their ends, provided with triangular shaped notches at their sides and having their respective ends bent and formed into the proper shape by suitable die mechanisms.

Still a further object is to provide such a machine wherein a part of the mechanism for performing the operation just mentioned will be operated from a rotatably reciprocating shaft, and wherein the remainder of the said mechanism will be operated from the ram of the punch press.

More particularly, my invention contemplates the bending of each length of strip around a plate which is then moved away from the strip to allow the ram to contact with the strip for folding the ends over the central portion of the strips, and providing a pair of guides wherein the strip will slide to position where it will be acted upon by a pair of dies for bending the folded strip into its final form.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a front elevation of the machine.

Fig. 2 is a side elevation of the same.

Fig. 3 shows a length of strip such as is used for making the floor clips illustrating the different operations which are performed upon it.

Fig. 4 is a perspective view of a finished clip.

Fig. 5 is a detailed, sectional view through the center of the channel shaped guide member, illustrating the mechanism for perforating, punching, cutting, indenting, and bending the strip.

Fig. 6 is a detailed, sectional view of one of the punch members taken on the line 6—6 of Fig. 5.

Fig. 7 is a view of the bottom of a plunger illustrating the triangular shaped dies thereon.

Fig. 8 is a sectional view illustrating the shearing or cutting mechanism taken on the line 8—8 of Fig. 5.

Fig. 9 is a detailed, sectional view illustrating a portion of the bending mechanism and the means for removing the slidable place from engagement with the strips, taken on the line 9—9 of Fig. 1.

Fig. 10 is a perspective view of the bending mechanism, parts being shown in section.

In the use of my present invention it is desirable to produce clips similar to those shown in Fig. 4, which are adaptable to be set into a concrete bed in rows, and so alined as to form anchoring means for the sleeper strips to which the floor is nailed.

In general the clip when laid in the cement is U-shaped, as shown in Fig. 4, having the central horizontal member 10 with downwardly bent arms 11, the metal being doubled back upon itself at 12 and having the ears or flaps 13 bent or folded over the back 10 as shown.

After the cement has hardened, the ears 13 are raised to a perpendicular position, so as to extend above the floor and to provide yoke-shaped anchoring means for a strip of wood which is to be laid between the upright ears 13. Nails are driven through the holes 14 to hold the strips of wood securely in place.

The clips are placed in the floor in rows spaced apart and the wooden strips then provide a very rigid foundation for a floor.

It is necessary that the ears 13 be bent

over, as shown in Fig. 4, in order that they will not form obstructions to the workmen crossing the concrete bed prior to the time of laying the wooden floor.

5 In order to facilitate the pushing of the clips into the cement, it is desirable to taper the lower ends of the arms 11 as shown at 15. It is also necessary to provide the protruding cone shaped members 16 in order
10 that the clip will remain securely embedded in the cement.

I will now explain the different steps necessary in order to produce the finished clips from a long strip of metal, a portion of
15 which is shown in Fig. 3.

Fig. 3 illustrates a section of the strip as it would appear after having been made into a complete clip and then straightened out into its original form.

20 In my machine the holes 14 are first punched in the strip in groups of four shown at A in Fig. 3. The groups of holes are spaced from each other, a distance equal to the length of one section of strip.

25 At the same time the notches 15^a which produce the beveled portions 15 are cut in the section of strip just ahead of the mechanism which punches the holes at A, and the section of strip preceding the last mentioned
30 section is severed from the strip, as at B.

During the continuing operations the ends of each section will be bent first on the lines C to form a flat folded portion of a strip with the portions 12 and 13 on each side
35 folded over the middle portion 10. During the same operation the members 16 will be punched by suitable die mechanisms and finally the outer ends of the folded strip will be bent downward on the lines D to form a
40 complete clip as shown in Fig. 4.

The machine is constructed generally in the form of a punch press having a base 20 with the inclined bed 21 for receiving the lower dies and a large part of the mechanism for perforating, punching and bending
45 the strip.

The base 20 has the upwardly extending arms 22 having at the tops thereof the bearings 23 which journal a crank shaft 24. At
50 one end of the crank shaft 24 is the pulley 25 which is driven by a belt 26. On the other end of the crank shaft 24 is a circular plate 27 having in its outer face a cam slot 28.

55 Journalled at the center of the crank shaft 24 is a pitman 29 on which is resiliently mounted the ram 30 which is designed to receive on its lower face the die members for performing the desired operations.

60 The ram 30 travels up and down in the guides 31 which form part of the arms 22. On the outer face of the guides 31 on the same side of the machine as the plate 27 are mounted two bearing members 32 designed
65 to receive the connecting rod 33.

The upper end of the connecting rod 33 has a roller 34 which travels within the cam slot 28. Mounted on the bed 21 are the bearing members 35 and 36 near the respective ends thereof, which journal a shaft 37.
70

On the outer end of the shaft 37 on the same side of the machine as the plate 27 is mounted a short lever 38 which is connected to the rod 33 by a short link 39.

On the other end of the shaft 37 is an
75 eccentric pin 40 (Fig. 5). Fixed to the bed 21 below the pin 40 is a bracket 41 which is designed to support a channel shaped guide member 42 and also to form a matrix for the perforating mechanism which I will
80 now describe.

The bracket 41 has an upwardly extending sleeve 43 in which is mounted the plunger 44 having the perforating pins or die members 45. The plunger 44 has the bifurcated
85 portion 46 at its upper end designed to receive a connecting rod 47, which is pivoted to the plunger 44 by means of the pin 48, and which is pivoted at its upper end on the pin 40.
90

In the bracket 41 are the die holes 49, designed to register with the pins 45 for forming the matrix therefor. It will be noted that the upper face of the bracket 41 forms a continuation of the guide member 42.
95

Spaced slightly from the perforating mechanism just described is a punch mechanism E which is composed of the bracket 50 having the upwardly extending sleeve 51 designed to receive the plunger 52.
100

Eccentrically mounted on the shaft 37 above the plunger 52 (Fig. 5) is a disk 53 and journalled on the annular face of the disk 53 is the connecting rod 54 which is pivoted in the upper portion of the plunger
105 52 by the pin 55.

Spaced from the punch mechanism E just described, is an identical punch F, the parts of which are referred to by numbers the same as those used in describing the punch
110 E. The plunger 52 has at its lower end triangular shaped die members 56 which are arranged transversely on the lower face of the plunger 52 with their apexes facing each other as shown in Fig. 7.
115

Below the die members 56 and in the brackets 50 are triangular shaped notches 57 designed to register with the die members 56 and to provide the matrix therefor.

Spaced slightly from the punch mechanism F is a bracket 58 having the transverse slot 59 in its lower portion and having the bridge-shaped upwardly-extending member 60 which connects the two portions formed by the slot 59. The bridge 60 has a forwardly extending arm 61 on which is fixed a knife 62. The cutting edge 63 of knife 62 is positioned just above the level place which will be occupied by the strip of metal.
120

Just below the bridge 60 is pivoted an L-
130

shaped lever having the forwardly extending arm 64 and the upwardly extending arm 65. The lever is mounted in the bracket 58 by means of the pin 66.

5 On the shaft 37 is mounted a bifurcated lever 67 which has the rollers 68 at its outer end designed to engage either edge of the upwardly extending arm 65. At its upper end the arm 65 is curved for a short distance
10 on an arc of a circle having the shaft 37 as its center. This portion of the lever I have designated with the numeral 69.

The lever is bent forwardly below the portion 69 to provide the cam surfaces 70, and therebelow the lever is curved as at 71
15 on an arc which has the shaft 37 as its center when the arm 65 is moved rearwardly.

It may be mentioned here that the cam faces 70 are designed to be acted upon by
20 the inner roller 68 when the bifurcated arm 67 moves downwardly. This movement causes the arm 65 to be moved rearwardly until the roller 68 contacts with the curved portion 71 when the arm 67 will remain stationary until the lever 67 has moved back to
25 the cam faces 70.

It will be noted that an intermittent motion is thus provided, for raising the arm 64 at the proper time, in order that the lower
30 cutting blade 72 which is mounted on the outer end of the arm 64, may engage the upper cutting blade 62 in order to shear the strip G.

It will be noted that the guide member 42 is continued from the bracket 41 to the bracket 58, the bottom of the channel-shaped member being removed as at 73 in order to
35 allow for the punching dies already described.

I will now describe the mechanism for bending the strip. Mounted on the bed 21 is a block 74 which is cut away as at 75 and
40 75^a. The remaining portion of the block 74 I will designate by the numeral 76.

45 Mounted in the portion 76 are the pins 77 which have conical heads 78. There are two sets of the pins 77, one at each side of the portion 76 and there are four pins to each set.

50 A supporting plate 79 is resiliently mounted above the portion 76 and has the same longitudinal and lateral dimensions as the portion 76. Springs 79^a are provided to hold the plate 79 at the proper position so that its
55 upper face will be on a level with the channel-shaped guide 42.

Openings 80 are provided in the plate 79 which register with the pins 77 and into which the pins 77 project. A forming
60 plate 81 is provided which has at its center the rearwardly extending tail member 82 which is slidably mounted in a slot 83 in the block 74.

65 Through a slot 84 in the tail piece 82 there is mounted the guide bolt 85 which

holds the plate 81 in position. The forming plate 81 is spaced a sufficient distance above the plate 79 so that the strip G may be received between the plates.

It may be mentioned here that a section
70 of strip after being cut off is designed to have its ends bent upwardly around the ends of the plate 81 as a die, and that the plate 81 is then designed to be withdrawn from over the center of the section of strip in
75 order that the ends may be flattened down against the middle.

I will now describe the mechanism for performing this latter operation. Mounted on the bed 21 at one end, and the guides 31
80 at the other end, are the brackets 86 which are spaced from each other adjacent to the sides of the block 74.

Mounted near the center of the brackets 86 and spaced slightly above and forwardly
85 of the shaft 37 is a rock shaft 87. Near the center of the shaft 87 is loosely mounted a rocker arm 88 (see Fig. 9). The rocker arm 88 has a slot 89 at its lower end. Near the end of the tail piece 82 is a bracket 90
90 which has a connecting pin 91 slidably and pivotally received within the slot 89. The upper end of the rocker arm 88 is bent forward as at 92 and has a longitudinal cam slot 93.
95

A bracket 94 is mounted on the ram 30 and has a roller 95 which is received within the cam slot 93. The lower end of the cam slot 93 is offset as at 96.

It will be seen that as the ram 30 travels
100 downwardly the rocker arm 88 will remain stationary until the roller 95 reaches the offset portion 96 of the cam slot 93. The rocker arm will then be rotated on its axis, thus drawing the plate 81 forwardly.
105

A pair of shafts 97 are mounted on the block 74 in the slots 98 which are semi-circular in cross section and are held in place by bearing caps 99. The shafts 97 have the rearwardly extending turning members
110 100 which are formed as part of the shaft by cutting away three-quarters of the shaft, the remaining quarter being the lower outside quarter (see Figs. 10 and 5).

The forward ends of the shafts 97 have
115 pinion teeth 101 cut therein and rack bars 102 are extended through slots 103 and 104 in the cap 99 and block 74 respectively. The rack bars 102 are designed to mesh with the pinion teeth 101.
120

Short levers 105 are mounted on the shaft 37 above the rack bars 102. The levers 105 extend in the opposite direction from the lever or bifurcated arm 67. The links 106 connect the ends of the lever 105 with the
125 rack bars 102.

It will be seen that as the shaft 37 is rotated in the direction indicated by the arrow 107 in Fig. 9, the rack bars 102 will be pulled
130 upwardly and the turning members 100 will

be rotated in the direction indicated by the arrow 108 in Fig. 5. It may be mentioned here that the upper faces of the turning members 100 are arranged on a level with the upper face of the plate 79 and both of the channel members 42.

A gauge 109 is mounted on the bed 21 and so positioned that when the strip G is inserted in the machine the end of the strip will contact with the sides of the gauge so as to hold the strip in the correct position laterally and so that the distance from the end of the strip contacting with the gauge to the adjacent end of the plate 81, will be the same as the distance from the other end of the plate 81 to the knife 62.

Before describing in detail the remainder of the machine, I will explain the operation of that part already described. A length of strip G is inserted in the machine, being inserted under the perforating mechanism, under the punches E and F between the blades of the shearing mechanism and between the plates 79 and 81 near the end of the strip and is stopped by the gauge 109.

It will be seen that the channel shaped guide member 42 will enable the strip to be thus rapidly inserted in the machine. It may be mentioned here that strips of a convenient length are used and must be threaded very often into the machine.

The parts are so arranged that as the cam slot 28 forces the link 33 downwardly it will cause the shaft 37 to rotate in the direction indicated by the arrow 107 in Fig. 9. The perforating mechanism, the two punches, and the shearing mechanism will first punch and shear the strip leaving a portion between the plates 81 and 79 severed from the remainder. These first four elements perform their operations simultaneously.

An instant after the section between the plates 81 and 79 has been severed, the turning member 100 will have rotated enough to engage the ends of the severed section and bend them upwardly and will continue to rotate until the ends of the section have assumed the position shown in dotted lines in Fig. 5.

As soon as the ends of the section have taken this position the ram 30 will have descended enough so that the rocker arm 88 is moved and the plate 81 withdrawn from over the section of strip.

The lower end of the ram has a portion 110 extended forwardly under the shaft 37. As soon as the plate 81 has been completely withdrawn the lower face of the portion 110 will contact with the ends of the section and press them downwardly until they are folded flat across the central portion of the section. The plate 79 will, in the meantime, be pressed downwardly under the pressure and will allow the pins 77 to protrude and form the indentations 16.

Dies 111 are formed in the lower face of the ram to register with the pins 77 to form the matrix for producing the members 16. It may be mentioned here that the first section which is severed from the strip may be perforated and punched by placing the strip in the machine and using the shearing blades as a gauge.

In order to hold the section of strip in a proper position, as the plate 81 moves rearwardly, I provide a stripper plate 112 shown in dotted lines in Fig. 10 and in section in Fig. 9. The plate 112 engages the upwardly extending ends of the section so that when the plate 81 is withdrawn the severed section of the strip G remains unmoved.

After the operations just described have taken place and as the ram 30 moves upwardly, the plate 81 will move back and push the folded strip rearwardly in the machine into the slots 113 of the receiving guides 114. The guides are so positioned that the slots 113 will register with the edge of the plate 79. The folded strips will ordinarily slide by their own weight into the slots 113, the bed 21 of the entire mechanism being tilted for that purpose.

However, if the folded strip should stick, the plate 81 will push it on its return movement and push it out of the way. The guides 114 have laterally projecting portions 115 to form stops or gauges for the strip.

A block 116 is mounted in the bed 21 midway between the guides 114 and so positioned that the folded strip will be centered thereover when it is stopped by the gauges 115. It will be noted that the inner sides of the receiving guides 114 are cut away opposite the lateral sides of the block 116 so that the folded strip, when it assumes its final position, is resting on the block 116 alone.

A matrix embodying a pair of lugs 117 is provided on the face of the ram 30, and the lugs 117 are spaced to loosely fit over the sides of the block 116.

Raised letters 118 may be provided on the lower face of the ram 30 between the lugs 117 in order to impress on the upper face of one of the flaps 13 of the clip, any printed matter, which may be desired, such as for instance the word "Patented 1922," etc., as shown at 119 in Fig. 4.

As the ram 30 descends and as the previously described operations take place upon a severed section and on the end of the remaining portions of a strip, the lugs 117 will force the projecting ends of the folded strip downwardly to form the completed floor clip.

It may be mentioned that the lugs 117 are of such lengths that they will not contact with the block 116. As the lugs 117 force the ends of the folded strip downwardly, these ends will enter the slots 120 which are arranged adjacent to the side of

the block 116 and extend rearwardly therefrom.

As the next folded strip passes downwardly to position over the block, the completed clip will be moved off the block and will slide in the grooves 120 to any suitable receptacle.

It will be seen that I have provided a machine in which the operations of perforating, punching, indenting, bending, and re-bending the clip successively take place and in which a long strip of metal may be fed and converted into finished clips. The clips may be turned out at the same rate as any simple stamping which is made in an ordinary punch press.

Some changes may be made in the construction and arrangement of the various parts of my invention, without departing from the real spirit and purpose of my invention and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. In a machine for making finished floor clips from a strip of metal, a base, a guide for supporting the strip, a shaft mounted above the guide, means for imparting rocking movement to the shaft, a perforating mechanism disposed above the guide and operably connected with the shaft for perforating a plurality of holes in the strip, means operably connected with the shaft for cutting the strip into lengths, means operably connected with the shaft for bending the ends of each strip at substantially right angles to the central portion thereof, means for folding the ends flat against the central portion, and means for bending the end portions thus formed at right angles to the remaining central portion, the said end portions to be bent in the opposite direction to the bending of the ends of the original length of strip.

2. In a machine for making finished floor clips from a strip of metal, a base, a guide for supporting the strip, a shaft mounted above the guide, means for imparting rocking movement to the shaft, means operably connected with the shaft for cutting the strip into lengths, means operably connected with the shaft for bending the ends of each strip at substantially right angles to the central portion thereof, means for folding the ends flat against the central portion, and means for bending the end portions thus formed at right angles to the remaining central portion, the said end portions to be bent in the opposite direction to the bending of the ends of the original length of strip.

3. In a machine for making finished floor clips from a strip of metal, a bed, a ram

adapted to vertical reciprocating movement above the bed, an element for supporting a strip, a gage spaced laterally for properly positioning the strip over said supporting element, a movable plate spaced above said supporting element, turning members arranged at the ends of the plate for bending the ends of a strip inserted between the plate and the supporting member, the movable plate being adapted to slide back from engagement with the strip, and the ram being adapted to flatten the ends of the strip against the middle while the plate is in its retracted position.

4. In a machine for making finished floor clips from a strip of metal, a bed, a ram adapted to reciprocate vertically above the bed, a resiliently mounted plate on the bed for supporting a strip, a movable plate above said supporting plate, means for bending the ends of a strip of metal received between the plates around the ends of the movable plate as a die, the ram being adapted to flatten the ends of the strip upon the middle, the movable plate being adapted to recede from contact with the strip for this purpose, and means for forming lugs on the folded strip, said means including pins mounted below the resiliently mounted plate, said plate having openings for allowing the pins to pass through the plate when it is depressed, the ram having indentations in its lower face spaced to register with the pins and designed to form with the pins a set of dies.

5. In a machine for making finished floor clips from a strip of metal, an inclined bed, means for folding the ends of a strip of metal over the middle thereof, a block mounted on the bed below said folding means, a ram, a matrix on the lower face thereof and designed to bend the ends of the folded strip over the block as a die, the folded strip being adapted to slide by gravity to position over the die.

6. In a machine for making finished floor clips from a strip of metal, an inclined bed, means for folding the ends of a strip of metal over the middle thereof, a block mounted on the bed below said folding means, a ram, a matrix on the lower face thereof and designed to bend the ends of the folded strip over the block as a die, the folded strip being adapted to slide by gravity to position over the die, and means for impressing lettering upon the upper face of the upper folded end of the strip.

7. In a machine of the class described, mechanism for punching and cutting strips of the desired length from a strip for making floor clips, said mechanism including a bed, a shaft arranged above the bed and parallel thereto, means for imparting rocking movement to the shaft, a pair of dies adapted to punch groups of four holes at points spaced along the length of the strip, two

pairs of dies adapted to cut triangular portions from the sides of the strip and shearing mechanism for cutting the strip into lengths.

- 5 8. In a machine of the class described, mechanism for punching and cutting strips
of the desired length from a strip for mak-
ing floor clips, said mechanism including a
bed, a shaft arranged above the bed and par-
10 allel thereto, means for imparting rotating
reciprocal movement to the shaft, a pair of
dies adapted to punch four holes at points
equidistantly spaced along the length of the
strip, two pairs of dies adapted to cut tri-
15 angular portions from the sides of the strip
at points spaced from the said holes, and
shearing mechanism for cutting the strip
into lengths, said mechanism including a
fixed knife adapted to engage the upper side
20 of the strip, a moving knife below the strip,
said moving knife being mounted on a bell-
crank lever, an arm fixed to the shaft and ex-
tending to the end of the bell crank lever,
rollers thereon for engaging the lever, the
25 upper end of the lever having cam surfaces
so arranged that when the arm swings down-

wardly the lever will be moved to position for cutting the strip.

9. In a device of the class described, a base, an inclined bed thereon, a ram, mecha- 30
nism for bending lengths of strips into floor
clips, said mechanism including guide means
for holding the strip in position, a plate po-
sitioned over the center of the strip, rota- 35
table members at the ends thereof for bend-
ing the ends of the strips at right angles to
the center portion thereof around the ends
of the plate as a forming die, means for mov-
ing the plate to a position where the strip is
exposed, the ram being adapted to flatten the 40
ends of the strip against the central portion
thereof after the plate has been moved away
from the strip, a block mounted on the bed
below the mechanism just described, guide
members for conveying the folded strip to a 45
position centered over the block, and a ma-
trix on the lower face of the ram for bending
the folded ends of the strip down in the di-
rection opposite to that in which the original
ends are bent.

Des Moines, Iowa, June 21, 1922.

SIGURD E. ANDERSON.