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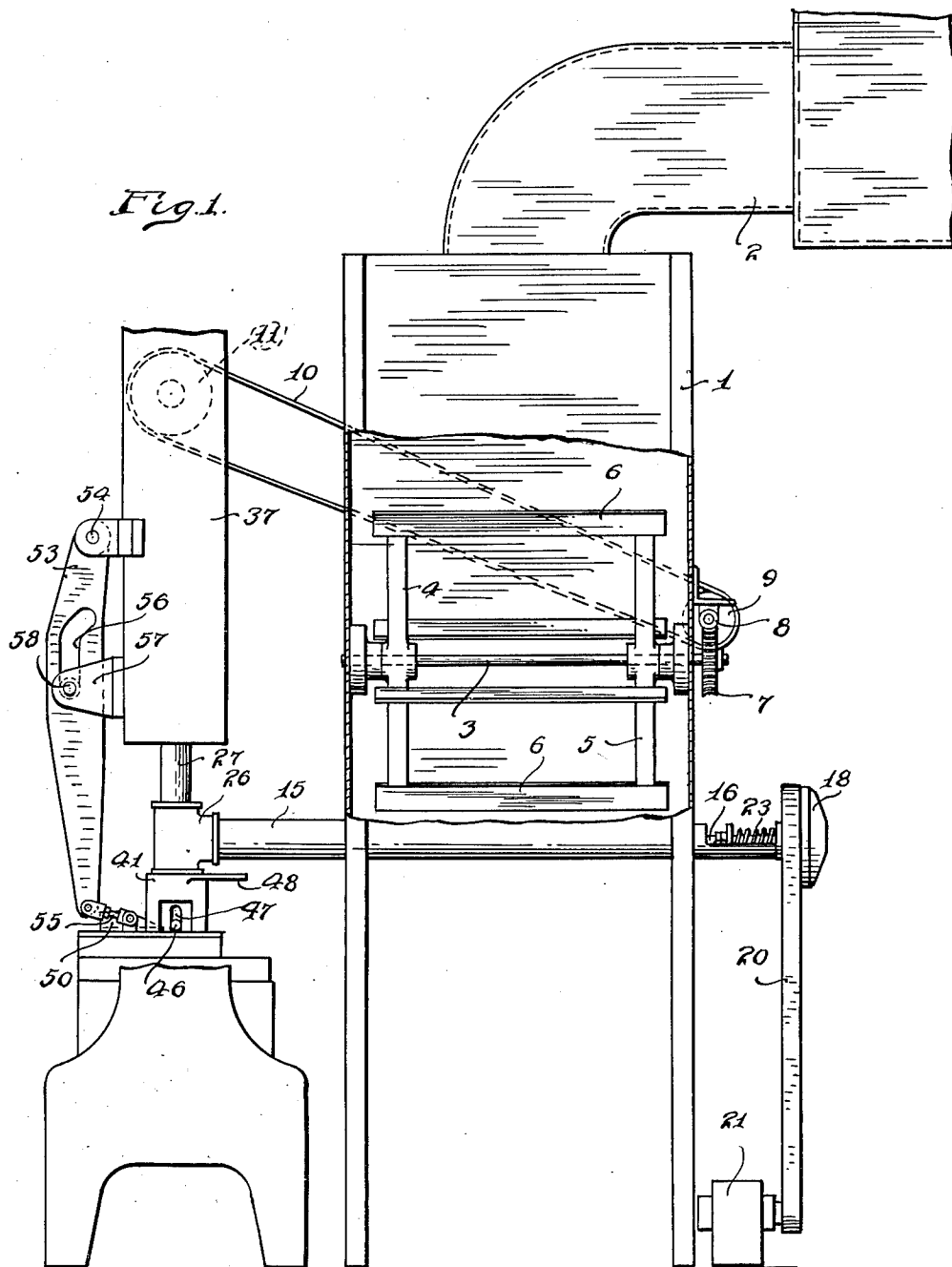
C. J. HETTEL

1,979,156

APPARATUS FOR MAKING SHAPED ARTICLES

Filed Oct. 22, 1931

3 Sheets-Sheet 1



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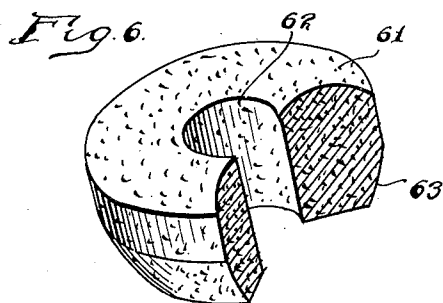
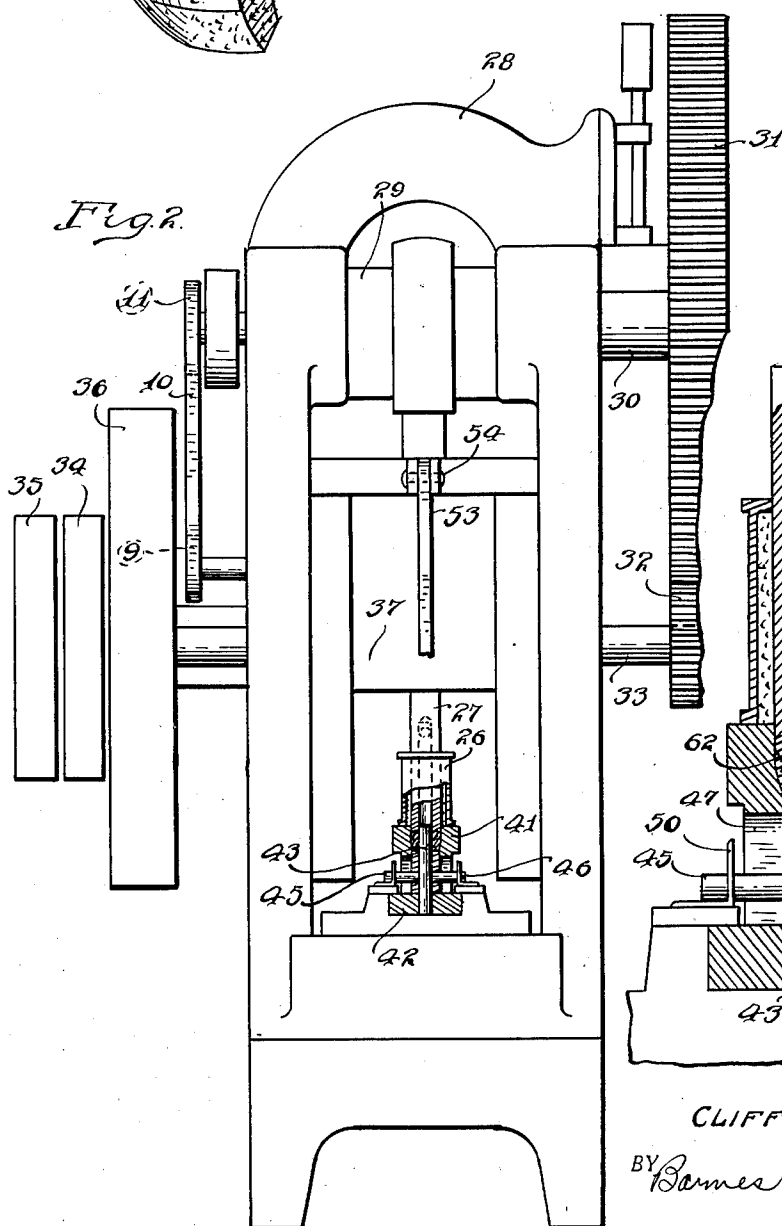
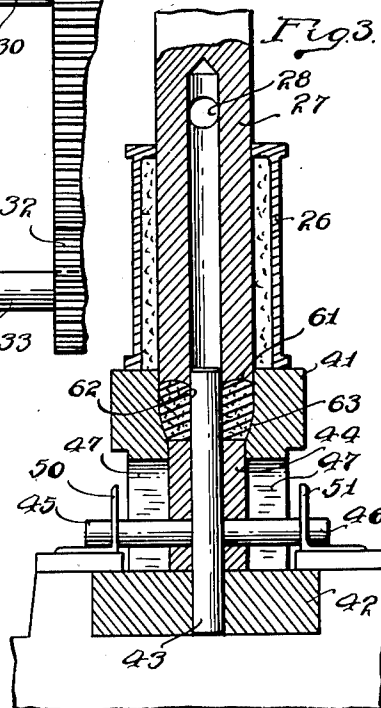
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APPARATUS FOR MAKING SHAPED ARTICLES

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3 Sheets-Sheet 2



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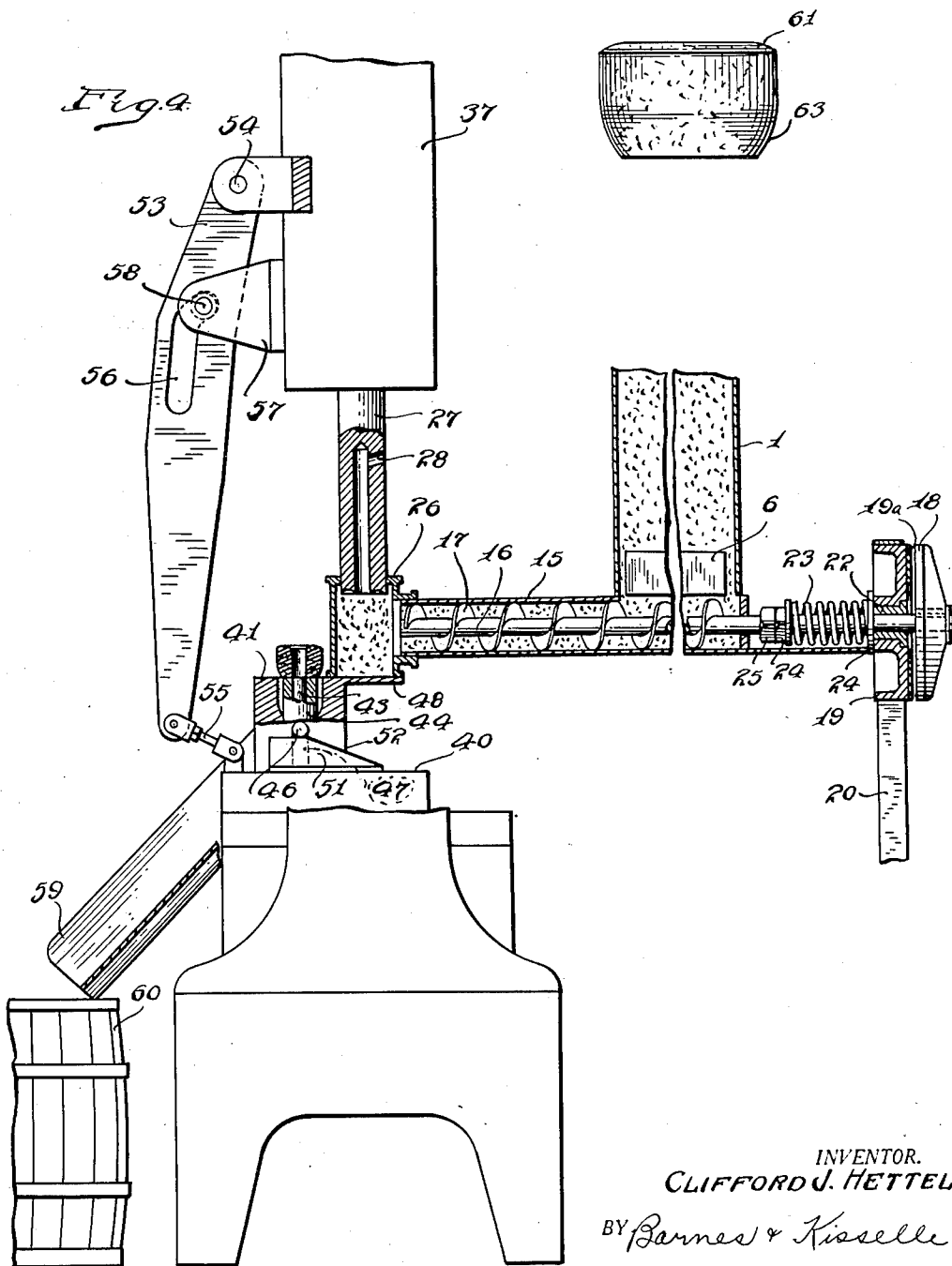
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Fig. 5.



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UNITED STATES PATENT OFFICE

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APPARATUS FOR MAKING SHAPED
ARTICLESClifford J. Hettel, River Rouge, Mich., assignor
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a corporation of Michigan

Application October 22, 1931, Serial No. 570,412

4 Claims. (Cl. 18—16)

This invention relates to an apparatus and method of making articles of manufacture from material which otherwise would be wasted, and also to such articles of manufacture. The particular material contemplated from which articles of manufacture are to be made and which otherwise would be wasted is wax paper.

In making products of wax paper, such as wrappers, or the like, there is a waste of the paper, which result is due to the cutting of the wax paper into suitable sizes, and which waste comprises of small pieces which may be either relatively large or small, or in strip form. The invention contemplates utilizing this waste material and making articles therefrom by subjecting a quantity of the wax paper to pressure, at which time the article may be given its final commercial shape. While the invention is particularly useful for utilizing wax paper waste it is not limited to using only wax paper waste, as the invention contemplates and may be employed in connection with other paper or fibrous material.

In the accompanying drawings:

Fig. 1 is a view of an apparatus such as may be employed for the purpose of carrying out the invention, the view showing some parts cut away to illustrate some of the detailed construction.

Fig. 2 is a view looking from the left hand side of Fig. 1 illustrating a press or forming device with some parts in section.

Fig. 3 is an enlarged sectional view illustrating the article-forming mechanism.

Fig. 4 is an enlarged view with some parts in section illustrating the arrangement of the apparatus which may be employed.

Fig. 5 is a side view of an article which may be made in accordance with the invention.

Fig. 6 is a perspective view thereof showing some parts in section.

The particular article of manufacture herein shown is a bearing plug or spool like device useful for plugging the ends of a roll of paper and which may be provided with a central aperture for fitting over a spindle or the like so as to form a bearing upon which the roll of paper may turn as the paper is drawn therefrom. Other articles of manufacture may be made in accordance with the invention but this particular article and machine for making the same is shown and described herein for the purpose of presenting the invention.

Referring to Fig. 1 there will be seen a hopper 1 leading into the top of which is a pipe or con-

duit 2 for discharging into the hopper quantities of waste wax paper. Mounted within the hopper for rotation is an agitator which may be secured to the shaft 3, having radially extending arms 4 and 5 and equipped with paddles 6. Advantageously, there are four arms and four paddles. This agitator is rotated, and for this purpose the shaft 3 may have on one end a worm gear 7 with which meshes a worm 8 rotated by a pulley 9. The pulley 9 is connected by a belt 10 to a pulley 11 for rotation with the operation of the press or forming device. This is merely one way of rotating the agitator.

By referring to Fig. 4 it will be noted that at the bottom of hopper 1 there is a tubular like member 15 which is open at its top inside of the hopper and which projects from the hopper as shown. Positioned in the tubular member 15 is a feeding screw comprising a shaft 16 carrying a feeding screw formation 17. The shaft 16 at one end projects from the hopper, and secured thereto as by means of a key is a driven clutch member 18. A driving clutch member 19, which may be in the form of a pulley driven by belt 20 running over the pulley of the motor 21, is journaled on a spindle 22 which may be carried by the end of the member 16 so that the member 19 may rotate independently of the driven member of the clutch 18 and the feed screw. A coil spring 23 is arranged to normally urge the feed screw from right to left for which purpose it backs up against an abutment 24 which may be carried by the end of member 16 and reacts upon the feed screw through the means of an adjusting nut 24 and lock nut 25 screw threaded upon the shaft 16. This spring holds the clutch members packed together so that the part 19 drives the part 18. The clutch may be of friction type for which purpose one member may be provided with friction facing material. As shown, driving part 19 has friction facing material 19a.

The end of the tube 15 remote from the hopper communicates into a fixture, which in the present instance, takes the form of a fitting of T shape, as shown at 26. This T fixture underlies a plunger 27 of a suitable press. The frame of the press is illustrated at 28 and the plunger is reciprocated by means of a crank 29. This crank is on shaft 30 rotated by gear wheel 31 meshing with gear 32 on drive shaft 33 which may be driven by a suitable belt running over a pulley 34. Pulley 35 may be an idler pulley upon which the belt may be shifted, while a fly-wheel is shown at 36. The plunger 27 is carried

by a ram 37 which reciprocates in guideways of the press frame.

The bed plate of the press is shown at 40 and carried by this bed plate in a manner so that it may be reciprocated is a die member 41. This die member is carried by slide 42 (Fig. 3) which carries a core 43 in the form of a stud or the like which projects up into the die 41. Surrounding the core 43 is a stripper 44, and projecting from opposite sides of the stripper are studs 45 and 46 which extend through the walls of the die 41, the walls having elongated openings 47 for this purpose. Mounted upon the bed plate on opposite sides of the die are inclined plane members which may be in the form of angle irons as shown in Fig. 3. These members are shown at 50 and 51, respectively, and each has an inclined surface 52 designed to cooperate with the studs 45 and 46.

Carried by the frame of the press is an arm 53 pivotally connected with the frame, as at 54, and connected to slide 42 by means of a link 55. A cam slot 56 is in the arm, and the ram 37 carries a bracket 57 upon which is a roller 58 operating in the cam slot. As the ram reciprocates the roller and cam slot engagement causes the arm 53 to rock, and in turn to reciprocate the slide and die upon the work bed of the press. A chute 59 is located in close proximity to the work bed of the press, and finished articles are designed to slide down this chute where they may be collected in a suitable receptacle, as at 60. The die member 41 has an extension 48 in the form of a little table, the purpose of which will presently appear.

In the operation of the device the waste paper products are maintained in the hopper by entering through the conduit 2, and the agitator 6 keeps the waste products agitated and tends to fill the tube of the screw feed member at the bottom of the hopper. The screw feeds the material out through the tube 15 into the fixture 26. This condition may exist when the parts are in the position substantially represented in Fig. 4 and the waste paper products are packed into the fixture 26 by the screw until the pressure is sufficient to shift the screw from left to right against the spring 23. This separates the driven member of the clutch 18 from the driving member of the clutch 19 and the rotation of the screw ceases. As shown in Fig. 4, the clutch has been released and the paper products are packed into the fixture 26 and compacted therein against the extension or table 48. As the punch descends into the fixture 26 the die moves in underneath the fixture 26 to the position shown in Fig. 1, whereupon the waste paper compacted in the fixture is compressed as shown in Fig. 2. The die moves in by the action of the roller 58 in the cam slot 60. As the punch raises this same action causes the die to move out from underneath the fixture 26 from the position shown in Fig. 1 to substantially the position shown in Fig. 4. During this time the studs 45 and 46 ride up the inclined faces 52 so as to raise the stripper 44. This ejects the finished product, as shown in Fig. 4. When the ram again descends the finished product, which has been ejected, is merely knocked off of its position as the die moves in underneath the fixture 26 and falls down the chute 59.

It will be noted that the machine is entirely automatic in its nature in that it may be set into operation, and then its operation continues with-

out attention, the only thing necessary being the maintaining of the hopper with the quantity of material therein. Preferably the speed of the agitator 6 is such as to insure that sufficient material is agitated and caused to move into engagement with the screw feed so that enough material is fed to compact the same into the fixture 26 upon each cycle of operation.

For making an article of manufacture which is hollow, as shown herein, the punch 27 may be hollow so that excess material may enter the same and may pass out through an aperture 28. As the hollow punch moves down into the die in compressing the material, the core 47 is received in the hollow punch as shown in Fig. 3. The particular article shown comprises a body of compressed waxed paper material, the body being shown at 61 having a central aperture 62, and the body is suitably shaped so that its end of smaller diameter, as shown at 63, may be more or less pressed into the central opening at the end of the roll of paper, the aperture 62 serving as a bearing over a spindle so that the roll of paper may be rotated as pieces are drawn therefrom.

The waste paper particles which are used may be ground up into relatively fine form especially where the waste products are relatively large pieces. The forming of the articles may be under sufficient pressure so that the compressed material retains its shape in compressed form without utilizing a binding. However, it is within the invention to employ a binder, and binders which may be cited are silicate of soda, or a binder of asphalt or a material having an asphaltum base.

I claim:

1. An apparatus for making articles from pieces of wax paper or the like comprising, a plunger, a die for receiving and shaping the wax paper by pressure of the plunger, means for reciprocating the plunger, means operating in timed relation with the plunger for reciprocating the die in a path at right angles to the plunger movement, a hollow fixture into which one end of the plunger extends, means for filling the fixture with paper particles, said fixture being open on the side opposite the plunger, and said die being shiftable into alignment with said fixture, and means carried by the die for closing said open side of the fixture when said die is in disalignment with the fixture, a stripper in the die, means for moving the stripper relative to the die as said die moves out of alignment to said fixture.

2. An apparatus for making shaped articles from particles of wax paper material comprising, a hopper for the material, a tubular conveyor projecting from the hopper, a feed screw for passing the material through the tubular conveyor, a hollow fixture on the end of the tubular conveyor having opposed openings which open in a direction at right angles to the tubular conveyor, said feed screw being adapted to feed the material into the fixture under pressure and with substantially continuous action, a plunger fitted into one opening of the fixture, means for reciprocating the same, a single die movable into and out of alignment with the other opening of the fixture to receive and shape the material under pressure of the plunger and a stripper effective for ejecting the shaped material from the die when the same is out of alignment with the fixture.

3. An apparatus for making shaped articles

from particles of wax paper material comprising, a hopper for the material, a tubular conveyor projecting from the hopper, a feed screw for passing the material through the tubular conveyor, a hollow fixture on the end of the tubular conveyor having opposed openings which open in a direction at right angles to the tubular conveyor, said feed screw being adapted to feed the material into the fixture under pressure with substantially continuous action, a plunger fitted into one opening of the fixture, means for reciprocating the same, a die member positioned in alignment with the other opening of the fixture upon movement of the plunger into the fixture and adapted to receive and shape the material under pressure, means for reciprocating the die member into and out of alignment with the fixture, means carried by the die member for covering the opening of the fixture whereby shaped material may be removed from the die member when it is out of alignment with the fixture and when the same is out of alignment therewith whereby the fixture remains substantially closed at all times.

4. An apparatus for making shaped articles from particles of wax paper material comprising, a hopper for the material, a tubular conveyor projecting from the hopper, a feed screw for passing the material through the tubular conveyor, a hollow fixture on the end of the tubular conveyor having opposed openings which open in a direction at right angles to the tubular conveyor, said feed screw being adapted to feed the material into the fixture under pressure, a plunger fitted into one opening of the fixture, means for reciprocating the same, a die member positioned in alignment with said other opening of the fixture upon movement of the plunger into the fixture and adapted to receive and shape the material under pressure of the plunger, means for reciprocating the die member into and out of alignment with the fixture, means carried by the die member for covering the opening of the fixture when the die is out of alignment with the fixture whereby the fixture remains substantially closed at all times, a stripper and means operating the stripper incident to movement of the die out of alignment with the fixture for ejecting a shaped article from the die.

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30 105

35 110

40 115

45 120

50 125

55 130

60 135

65 140

70 145

75 150

CERTIFICATE OF CORRECTION.

Patent No. 1,979,156.

October 30, 1934.

CLIFFORD J. HETTEL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, lines 19, 20, 21 and 22, claim 3, strike out the words "whereby shaped material may be removed from the die member when it is out of alignment with the fixture and" and insert the same after "fixture," in line 18, of said claim; 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 5th day of February, A. D. 1935.

(Seal)

**Leslie Frazer
Acting Commissioner of Patents.**