

Feb. 23, 1943.

B. F. SAUBESTRE

2,311,698

SCORING MACHINE

Filed Dec. 3, 1941

3 Sheets-Sheet 1

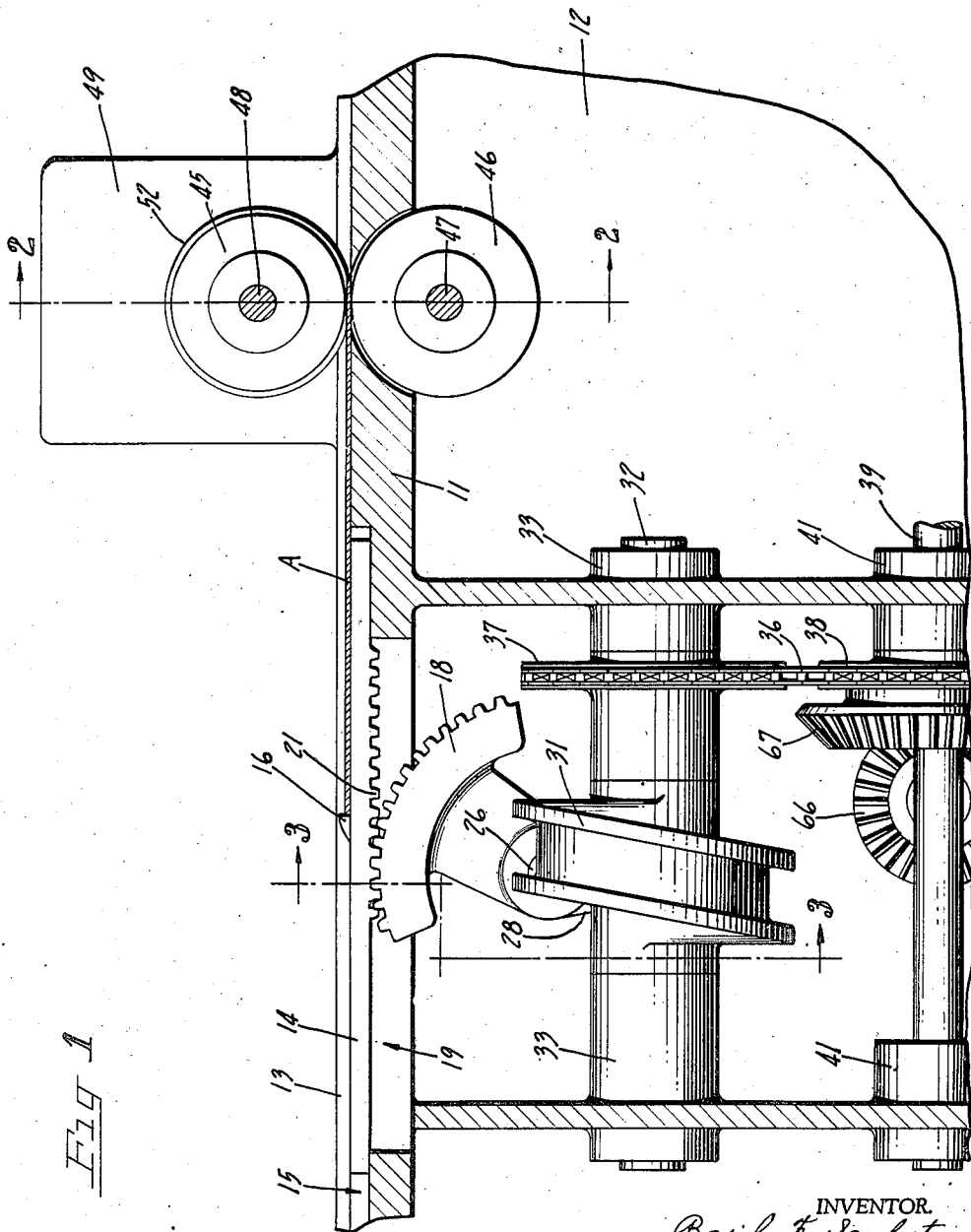


Fig. 1

INVENTOR.
Basil F. Saubestre
BY *Ivan D. Thornburgh*
Charles H. Cene
ATTORNEYS

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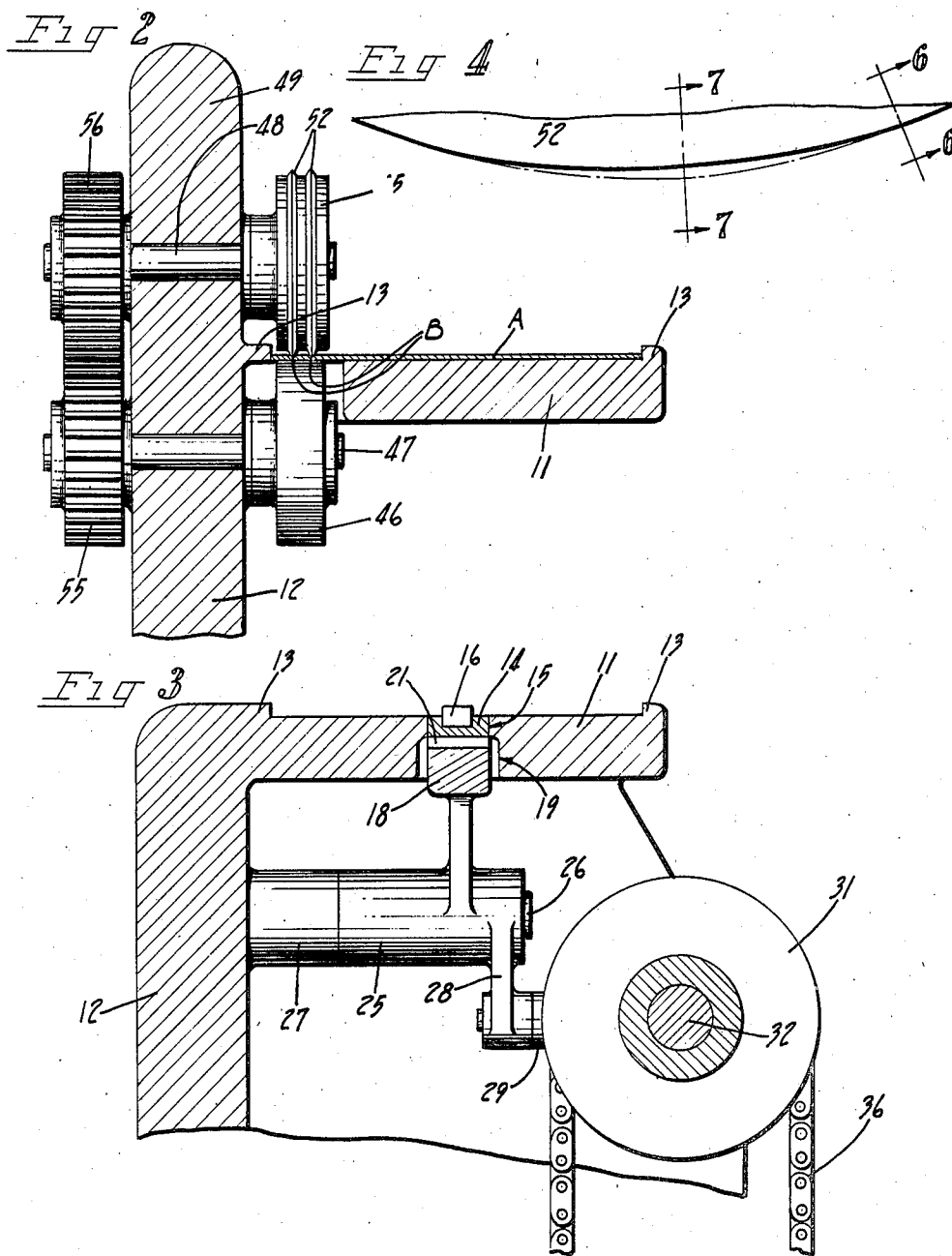
B. F. SAUBESTRE

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3 Sheets-Sheet 2



INVENTOR.
Basil F. Saubestre
BY *Ivan D. Thornburgh*
Charles H. Bine
ATTORNEYS

Feb. 23, 1943.

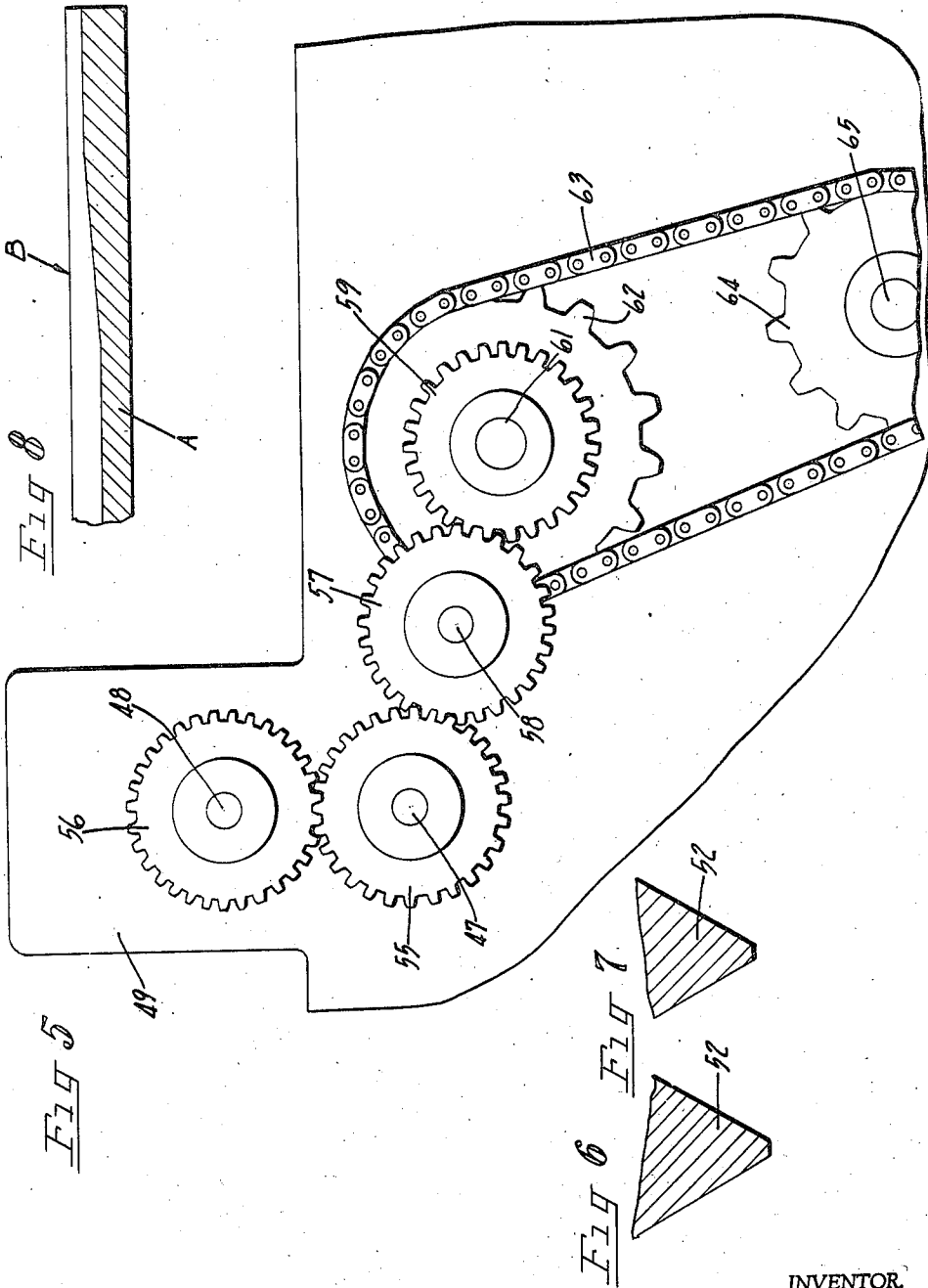
B. F. SAUBESTRE

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Filed Dec. 3, 1941

3 Sheets-Sheet 3



INVENTOR
Basil F. Saubestre
BY *Ivan D. Thornburgh*
Charles H. Erbe
ATTORNEYS

UNITED STATES PATENT OFFICE

2,311,698

SCORING MACHINE

Basil F. Saubestre, Elmhurst, N. Y., assignor to
American Can Company, New York, N. Y., a corporation of New Jersey

Application December 3, 1941, Serial No. 421,516

3 Claims. (Cl. 164—61)

The present invention relates to scoring machines for producing score lines in sheet metal containers or cans of the tearing strip type and has particular reference to producing a score line with a portion having a different depth and strength from the rest of the line.

In the manufacture of sheet metal cans of tearing strip character the blanks from which the cans are made are usually scored prior to the blanks being formed into tubular can bodies, to set off the tearing strips. In the forming of the can bodies the side seam edges of the blanks are bent into hooks which are interengaged and squeezed tightly together to produce the usual side seam. It has been found that in certain kinds of cans the forming of the side seams sometimes ruptures the score lines for a short distance adjacent the seams and thus renders the can useless as a container.

The instant invention contemplates overcoming this difficulty by providing a scoring machine which will cut a score line of less depth adjacent the side seam edge of a can body blank and thereby make the blank somewhat stronger at this portion of the score line to prevent such rupture of the line.

An object therefore of the invention is the provision of a scoring machine having rollers for scoring flat sheet metal can body blanks wherein the scoring roller is formed to produce in a blank a score line having a portion in a predetermined location in the blank of a different depth than the remainder of the score line, so that the blank adjacent this predetermined portion will have a strength different from that along the remainder of the score line.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a longitudinal section taken through a scoring machine embodying the instant invention, with parts broken away;

Figs. 2 and 3 are transverse sections taken substantially along the lines 2—2 and 3—3 in Fig. 1, with parts broken away;

Fig. 4 is an enlarged fragmentary view of a side of the scoring roller used in the machine;

Fig. 5 is a side elevation of the machine as viewed from the left in Fig. 2, with parts broken away;

Figs. 6 and 7 are transverse sectional views of

the cutting edge of the scoring roller, the views being taken substantially along the lines 6—6, 7—7 in Fig. 4; and

Fig. 8 is a greatly enlarged schematic sectional view taken through a score line produced in a blank by the machine shown in Fig. 1 and illustrating the different depth of cut in the same score line.

As a preferred embodiment of the invention the drawings illustrate principal parts of a scoring machine in which a flat sheet metal blank A (Figs. 1, 2 and 8) is partially cut through along one longitudinal edge with a pair of parallel score lines B to set off a tearing strip in the can body to be made subsequently from the scored blank.

In such a machine a blank A to be scored is supported on a flat horizontal table 11 (Figs. 1, 2 and 3). This may be formed as an integral part of a frame 12 which constitutes the main frame of the machine. The blank is propelled along this table between a pair of guide ledges 13 by a reciprocating feed bar 14 which slides in a groove 15 formed in the table. The feed bar carries a dog 16 which engages behind the blank to propel it along the table.

The feed bar 14 is actuated through a forward or feed stroke and thence through an idle return stroke by a cam actuated segment gear 18 which is disposed under the table 11. This gear extends up through a slot 19 formed in the table directly under the feed bar and meshes with rack teeth 21 formed on the bottom of the feed bar.

The segment gear 18 is formed on a long hub 25 mounted on a pivot pin 26 secured in a boss 27 which extends out from the machine frame 12. The hub is formed with an arm 28 which carries a cam roller 29 and this roller operates in a cam groove of a barrel cam 31 mounted on a horizontal cam shaft 32. The cam shaft is journaled in a pair of spaced bearings 33 formed in the machine frame.

The cam shaft 32 is driven by way of an endless chain 36. This chain operates over a sprocket 37 mounted on the cam shaft 32 and over a driving sprocket 38 mounted on a driving shaft 39. The driving shaft is journaled in a pair of spaced bearings 41 formed in the machine frame and this shaft is driven in any suitable manner.

Thus rotation of the driving shaft 39 revolves the cam shaft 32 and the cam 31 carried thereon and this rocks the segment gear 18. Rocking of the segment gear reciprocates the feed bar 14, hereinbefore mentioned.

On a forward stroke of the feed bar 14 its dog 16 propels a blank A along the table 11 and brings

the leading edge of the blank into the grip and between a pair of scoring rollers. These rollers comprise an upper scoring roller 45 and a lower anvil roller 46. The anvil roller 46 is disposed or journaled in the table 11 and is formed with a smooth outer peripheral surface which is disposed tangentially flush with the top of the table so that the blank will engage the roller as it passes thereover. This roller is mounted on a short shaft 47 journaled in a bearing formed in the machine frame 11.

The scoring roller 45 is disposed above the table 11 and is mounted on a short shaft 48 journaled in a bearing extension or bracket 49 which extends up from the machine frame 12. This roller is formed preferably with a pair of spaced and parallel annular scoring or cutting edges 52 which engage the blank A as it passes between the rollers and which cut or impress the score lines B into the moving blank.

In order to cut one portion of the score line of less depth than the remainder of the line as hereinbefore mentioned, the scoring edge or edges 52 is or may be ground away or eased off to the desired dimensions to obtain the required lesser depth of cut. This easing off of the scoring edge or edges is or may be shown clearly in Fig. 4 and Figs. 6 and 7 show that the cross section of the cutting edge is retained to effect proper cutting of the blank. If desired one or both of the scoring edges 52 of the roller may be formed in this manner to obtain different depths of cut in one or both of the scores lines produced in the blank.

Fig. 8 shows clearly and upon a greatly enlarged scale the effect of such a scoring operation. In the portion of the blank that is scored by the eased off portion of the scoring edge 52, the score cut is more shallow than the remainder of the score line. Such a shallow portion of the score line leaves a greater amount of metal below it and hence the blank at this portion of the score line is of greater strength than that along the remainder of the line.

In order to locate the shallow portion of the score line in a predetermined section of the line, the scoring roller 45 and the anvil roller 46 are rotated in time with each other and with the feeding of the blank into position therebetween. For this purpose the anvil roller shaft 47 carries a spur gear 55 (Figs. 2 and 5) which meshes with and drives a similar gear 56 mounted on the scoring roller shaft 48. These gears drive the rollers in unison.

The anvil roller shaft gear 55 is driven by a meshing idler gear 57 which is mounted on a pin 58 secured in the machine frame 12. The idler gear is rotated by a driving gear 59 which is

mounted on a short shaft 61 journaled in suitable bearings in the machine frame. The shaft also carries a sprocket 62 which is driven by an endless chain 63. The chain operates over the sprocket 62 and over a driving sprocket 64 mounted on a shaft 65 journaled in suitable bearings formed in the machine frame. The inner end of the shaft 65 carries a bevel gear 66 (Fig. 1) meshing with and driven by a bevel gear 67 mounted on the main drive shaft 39.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In a scoring machine, the combination of a scoring roller having an annular scoring edge for producing a score cut in a blank of sheet material, a portion of said scoring edge being formed to produce a score cut of a different depth in a portion of the blank to render this portion of the scored blank of different strength than the other scored portion, and means for rotating said scoring roller to produce the score cut in the blank.

2. In a scoring machine, the combination of a pair of cooperating rollers for performing a scoring operation upon a sheet material blank passed therebetween, one of said rollers being formed with an annular scoring edge having an eased-off section to produce in a portion of the blank a shallower score cut than that produced by the remainder of the scoring edge so that the blank at the shallow score cut will be stronger than along the remainder of the cut, means for rotating said rollers to produce the score cut in the blank, and feeding devices operable in time with the rotation of said rollers for passing the blank between the rollers in a predetermined relation to the eased-off section of the score edge to locate the shallow score cut in a predetermined portion of the blank.

3. In a scoring machine, the combination of a scoring roller having a peripheral rotatable scoring edge for producing a score cut in a blank of sheet material, a portion of said peripheral scoring edge being of reduced radii to produce a score cut of less depth in the same score line when said roller is rotated relative to said blank, whereby different portions of the blank adjacent the score line will have different strengths, and means for rotating said scoring roller to produce the score cut in the blank.

BASIL F. SAUBESTRE.