

No. 747,578.

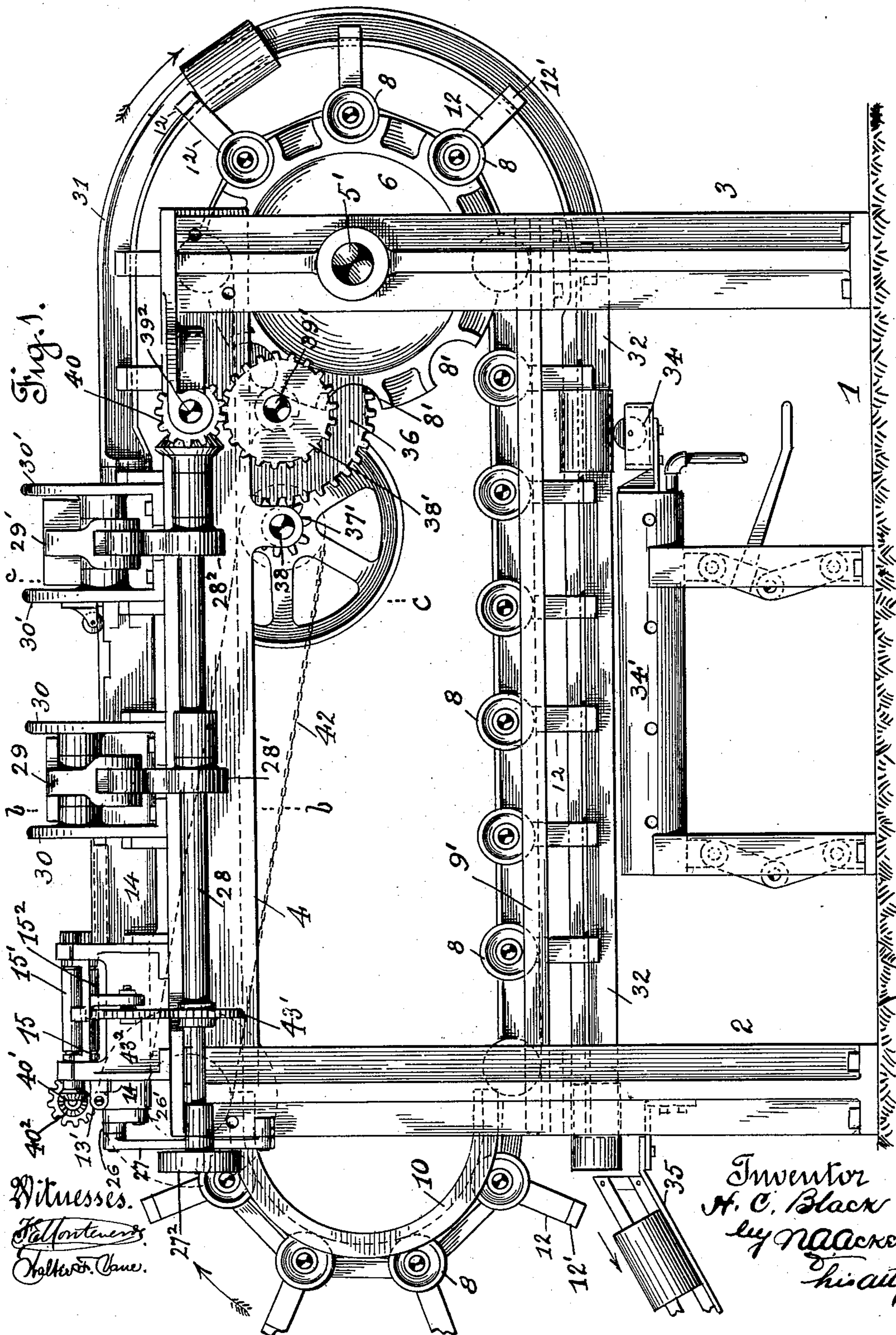
PATENTED DEC. 22, 1903.

H. C. BLACK.
CAN BODY FORMING AND SEAMING MACHINE.

APPLICATION FILED MAY 11, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



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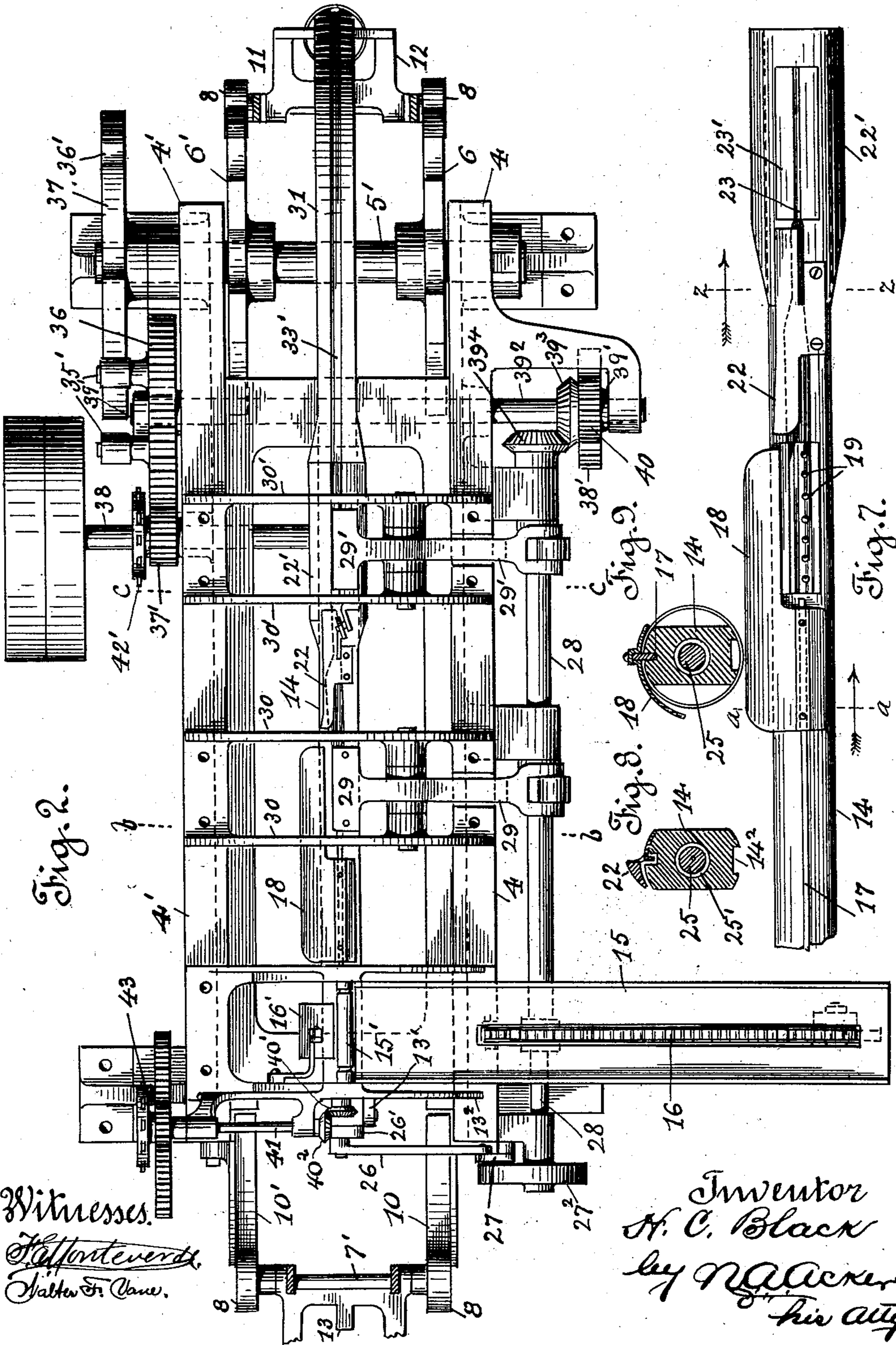
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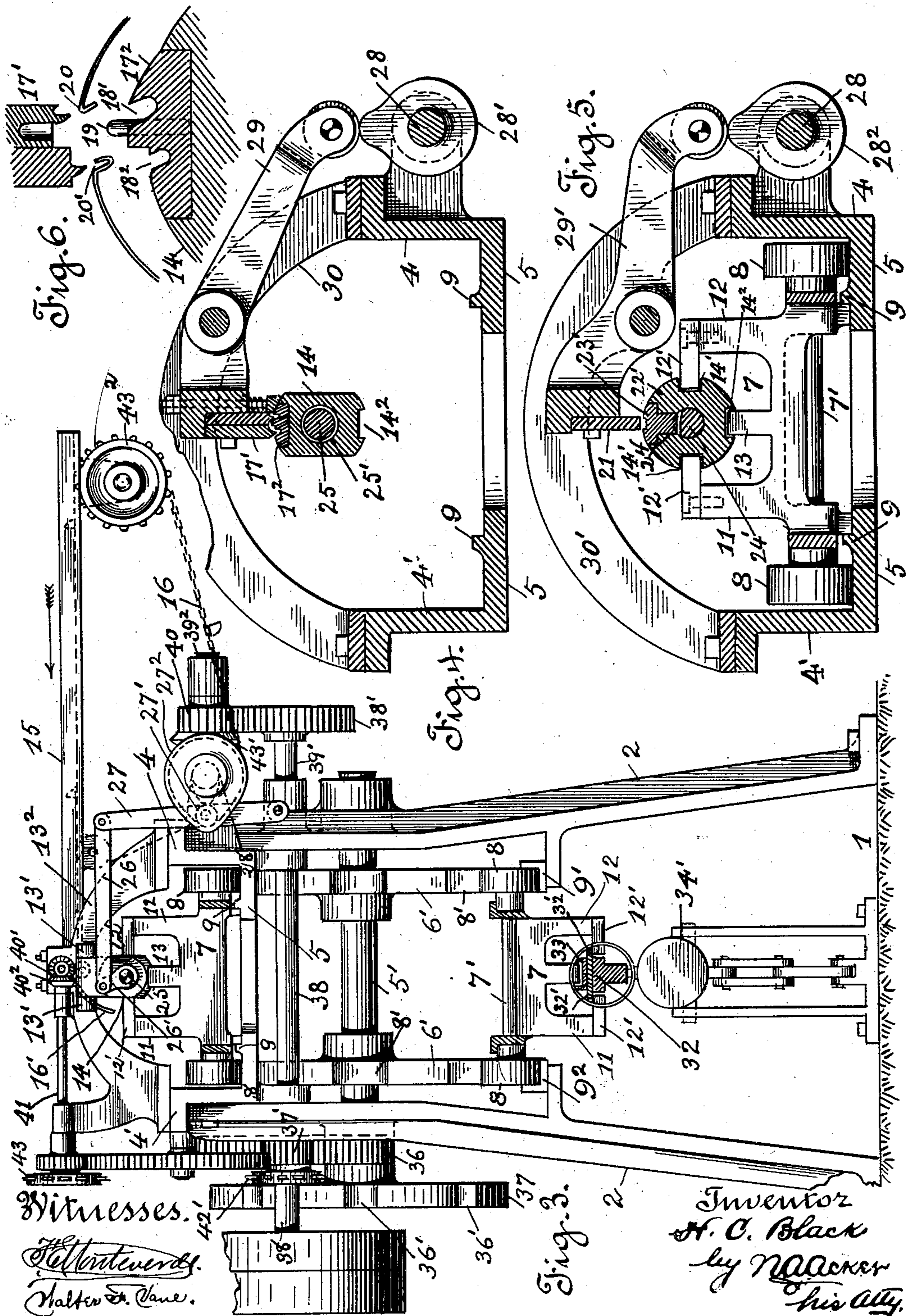
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

HENRY C. BLACK, OF SAN FRANCISCO, CALIFORNIA.

CAN-BODY FORMING AND SEAMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 747,578, dated December 22, 1903.

Application filed May 11, 1903. Serial No. 156,550. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. BLACK, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Can-Body Forming and Seaming Machines; and I do hereby declare the following to be a full, clear, and exact description of the same.

The present invention relates more particularly to certain improvements upon the can-body forming and seaming machine set forth and described in the application, Serial No. 116,951, filed by me in the United States Patent Office on the 25th day of July, 1902, the improvements residing in the anvil-bar around which the can-body blanks are formed, the construction of the endless carrier for propelling the can-bodies through the machine whereby the seamer-horns ordinarily employed are dispensed with, and in the connections for supporting the formed bodies as conveyed from the anvil-bar toward the discharge end of the machine. The means employed for feeding the can-body blanks into the machine and folding the said can-body blanks about the anvil-bar, for imparting an intermittent non-reciprocating movement to the endless carrier, for forming the interlocking hooks in the side edges of the can-bodies, and closing the side seam of the can-bodies is substantially the same as the corresponding means fully set forth in my aforesaid application, wherefore the same will only be briefly referred to in the present application.

To comprehend the invention, reference should be had to the accompanying sheets of drawings, wherein—

Figure 1 is a side view of the machine in elevation. Fig. 2 is a top plan view of the mechanism disclosed in Fig. 1 of the drawings, the endless carrier being broken away. Fig. 3 is an end view in elevation viewed from the feed end of the machine, the endless carrier being partly broken away and the curved end guides therefor being removed. Fig. 4 is a cross-sectional view, in end elevation, on line *b b*, Figs. 1 and 2 of the drawings, the anvil-bar being illustrated in position, the endless carrier, the drive mechanism, and the drive-disks being removed. Fig. 5 is a similar view taken on line *c c*, Figs. 1 and 2 of the

drawings, the anvil-bar and the endless carrier being illustrated in position. Fig. 6 is a detail sectional view disclosing the hook-forming mechanism for the side edges of the can-bodies. Fig. 7 is a top plan view of the anvil-bar. Fig. 8 is a cross-sectional end view of the anvil-bar, taken on line *z z*, Fig. 7 of the drawings; and Fig. 9 is a similar view taken on line *a a* on Fig. 7 of the drawings, said view disclosing the gage-rib for holding the rolled can-body separated, the can-body being broken away, and illustrating the oscillatory rod located within the anvil-bar.

The frame of the machine comprises a suitable bed 1, to which the end supports 2 3 are bolted, said end supports being united by the side pieces 4 4'. These side pieces are formed with the inwardly-projecting flanges 5, which support the upper run of the hereinafter-described endless carrier.

Within bearings of the end supports 3 works a cross-shaft 5', to which the disks 6 6' are secured. These disks serve as drive-disks for the endless carrier, which carrier consists of a series of frames or links 7, hinged together by bolts 7'. To the projecting ends of each connecting bolt or pin 7' the rollers 8 are secured, which rollers fit within segment-seats 8', cut in the periphery of each of the drive-disks and ride upon the supporting-flanges 5 of the side pieces, inside of the guides 9, upwardly projecting from each supporting-flange 5. These rollers also ride upon the guide-rails 9' 9², secured to the end supports 2 3, which rails are located a short distance below the supporting-flanges 5 and serve to support the under run of the endless carrier. At the feed end of the machine these guide-rails terminate at the curved guides 10 10', which support the endless carrier as it travels from the guide-rails 9' 9² toward the supporting-flanges 5.

Each frame or link 7 of the endless carrier is formed with projecting arms 11 12, which at their upper ends carry the inwardly-extending brackets 12'. Each frame or link is also formed intermediate the arms 11 12 with a centrally-projecting tongue 13.

Between the ears 13', depending from the curved bracket 13² near the feed end of the machine, is hinged the anvil-bar 14. This bar extends approximately the length of the

machine, the same being held in horizontal alinement by the endless carrier. The brackets 12' fit within the guideways 14', cut in the cylindrical portion of the anvil-bar, while the stud or tongue 13 works within the central guideway 14², cut in the under face of the said anvil-bar. Said anvil-bar is preferably rectangular in shape in cross-section, except at such portion thereof whereon the lock-seam of the can-bodies is closed by the hammer. At such point the said anvil-bar is cylindrical in shape, so as to completely fill the interior of the cylindrical can-body while the side seam is being closed.

At one side of the machine, at what I term the "feed" end, is located the feed-guide 15 for the can-body blanks, which can-body blanks are delivered between the feed-rolls 15' 15², located above the anvil-bar, by the feed-conveyor 16, working within the feed-guide 15. As the can-body blanks are conveyed through the feed-rolls they are deflected downward by the plate 16', so as to curl around the anvil-bar 14, the side edges of the curled blank being held apart or separated by the gage-rib 17, projecting above the said anvil-bar. The moment the can-body blank has been curled or rolled around the anvil-bar 14 the endless carrier is given an intermittent forward movement. Inasmuch as the brackets 12' and tongue 13 bear against the outer end or edge of the rolled can-body blank the said blank is advanced or moved upon the anvil-bar 14 until it is placed and brought to rest immediately beneath the hook-forming die 17'. During this movement the free edges of the can-body blanks are held down to prevent springing upward by means of the guide-plate 18.

In the face of the anvil-bar in line with the die 17' is inserted the die-block 17², in which are formed the grooves 18' 18², which grooves are formed on each side of a series of pins 19 and in shape correspond with the male and female hook-sections of the die 17'. As the hook-forming die is moved downward the side edges of the can-body blanks are forced into the groove 18' 18² in order to form the interlocking-hooks 20 20'. After the formation of the interlocking hooks in the side edges of the can-body the can-body blank is forced along the anvil-bar by the intermittent movement of the endless carrier until the same is placed beneath the hammer 21. During the movement of the can-body blank from the hook-forming mechanism toward the hammer 21 the free edges of the can-body pass beneath the guide 22, one of the side edges of the can-body as moved thereunder being gradually forced over until the hook 20 is placed into engagement with the hook 20'. Section 22' of the anvil-bar, immediately beneath the hammer 21, is cylindrical in cross-section. As the can-body blank is received onto this portion of the anvil-bar its temporarily-closed seam will rest above the longitudinal groove 23 in the face of the anvil-plate 23', fitted within a seat 24 cut in section 22' of the anvil-bar. As the hammer 21 is brought down onto the side seam to firmly close the interlocked hooks the anvil or hammer plate 23' is moved vertically or upwardly a slight distance in order to fill out or true the can-body circumferentially. This movement of the anvil or hammer plate is obtained by means of the eccentric portion 24' of an oscillatory rod 25, which rod extends through and works within a central opening 25' in the anvil-bar. This rod 25 is oscillated within the anvil-bar to raise the anvil or hammer plate 23' at the proper moment by means of the connecting-link 26, Figs. 2 and 3 of the drawings. One end of this link is connected to a crank-head 26', secured to the outer projecting end of the oscillatory rod 25, while the opposite end is attached to the free end of the fulcrumed link 27. From this lever projects a stud or pin 27', which works within an irregular-shaped groove cut in the inner face of the cam 27², secured to the forward end of the longitudinal shaft 28. The shaft 28 carries two cams 28' 28², which actuate, respectively, the arms 29 29'. These arms are fulcrumed between the curved brackets 30 30', the arm 29 having attached to its inner end the hook-forming die, while the arm 29' at its inner end carries the hammer for closing the side seam of the can-body blanks. The movement of the arms 29 29' is so timed that the tools carried thereby act upon the can-body blanks the moment they come to a state of rest at such points of the anvil-bar as to place the can-body blank beneath the respective devices, while the actuating mechanism for the oscillating rod 25 is so timed as to throw the said rod to raise the anvil or hammer plate 23' the moment the can-body blank is brought to a state of rest upon the cylindrical portion of the anvil-bar 14. After the side seam has been closed by the hammer 21 an opposite throw or movement is given to the rod 25, which permits of the mandrel or hammer plate lowering in order to allow of the formed can-body being easily slipped from off the cylindrical portion of the anvil-bar 14. As the inner end of the arm 29' is raised the step movement of the endless carrier forces the formed can-body onto the curved guide-track 31, which connects the inner end of the anvil-bar with the longitudinal T-shaped extension 32. This curved guide-track and the longitudinal extension 32 may be said to constitute a continuation of the anvil-bar, inasmuch as the adjoining ends of the section 31 and the anvil-bar and the adjoining ends of the said section 31 and the section 32 are bolted together. Sagging of the section 32 is obviated by reason of the fact that the same is upheld by the inwardly-extending brackets 12' of the links of the under run of the endless carrier bearing against the flanges 32', laterally extending from a guide-plate 33, attached to the head of the T-shaped extension or section 32, Fig. 3 of the

drawings. Within this guide-plate moves the tongue 13 of the links 7 of the endless carrier. In the face of the curved guide extension or section 31 is formed a guideway 5 33', into which fits the inwardly-projecting bead of the side seam. The can-body is thus held against side slippage as conveyed toward the section or extension 32. As the formed can-body is carried upon the extension or section 32 in case the same is to be soldered its side seam is first presented to the flux-applying device 34 and then to the soldering device 34'. When the end of the extension or section 32 is reached, the formed 15 can-body is forced therefrom by the movement of the endless carrier and delivered into can-runway 35. An intermittent movement is imparted to the endless carrier by the rolls 35', secured to studs projecting from the gear 36, alternately engaging with the 20 radial slots 36', cut in the disk 37, secured to the shaft 5', Fig. 2 of the drawings. The gear 36 is driven by the intermeshing pinion 37', mounted upon the drive-shaft 38. The 25 gear 36 is mounted upon a cross-shaft 39'. To the opposite end of the cross-shaft 39' is attached the gear 38', which meshes with a pinion 40, mounted upon the short shaft 39². Upon this shaft 39² is mounted the bevel- 30 gear 39³, which drives corresponding gear 39⁴ on the inner end of shaft 28.

The can-body-blank feed-roll 15' is driven by the intermeshing bevel-pinions 40' 40², the latter being secured to the inner end of the 35 shaft 41. This shaft is driven from the drive-shaft 38 by means of a sprocket-chain 42, working over the sprocket-wheels 42' 43.

The conveyer or feed chain for the can-body blanks works over sprocket-wheels 43' 43², the 40 former being mounted upon the shaft 28.

A more detailed description as to the drive mechanism, the working of the feed mechanism for the can-body blanks, and the working of the hook-forming and seam-closing 45 mechanism is not deemed necessary, inasmuch as the same is substantially that set forth in my former application, heretofore referred to.

Having thus described the invention, what 50 is claimed as new, and desired to be protected by Letters Patent, is—

1. In a can-body-forming machine, the combination with an intermittently non-reciprocating endless carrier, of an anvil-bar, means for forming a can-body blank around the anvil-bar, means coacting with the anvil-bar for forming interlocking hooks in the side edges of the can-body, means for closing the side seam, an anvil or hammer plate against which said means works, devices carried by the endless carrier for moving the can-body upon the anvil-bar, and means for actuating the anvil or hammer plate during the operation of the machine.

2. In a machine of the described character, the combination with an anvil-bar having a cylindrical portion, of an anvil or hammer plate fitted within a seat in said cylindrical portion of the anvil-bar, and an oscillatory rod working within said bar, said rod by its movement or throw adapted to impart vertical movement to the anvil or hammer plate. 70

3. In a machine of the described character, the combination with a hinged anvil-bar, of means for forming can-body blanks around the anvil-bar, an intermittently non-reciprocating endless carrier for conveying the can-bodies along the anvil-bar, mechanism for forming interlocking hooks in the side edges of the can-body, placing the hooked edges into engagement and closing the hooked edges to form a side seam during the step movement of the can-body upon the anvil-bar, a curved guide-track connected to the free end of the anvil-bar, and a longitudinal section united 85 to the free end of the guide-track.

4. In a machine of the described character, the combination with a stationary anvil-bar, of the endless carrier, said carrier being composed of a series of hinged links, arms projecting from the hinged links, inwardly-extending brackets carried by the projecting arms, a stud projecting from the links intermediate the projecting arms, and guideways in the anvil-bar within which the studs and inwardly-extending brackets work. 95

In witness whereof I have hereunto set my hand.

HENRY C. BLACK.

Witnesses:

WALTER F. VANE,
D. B. RICHARDS.