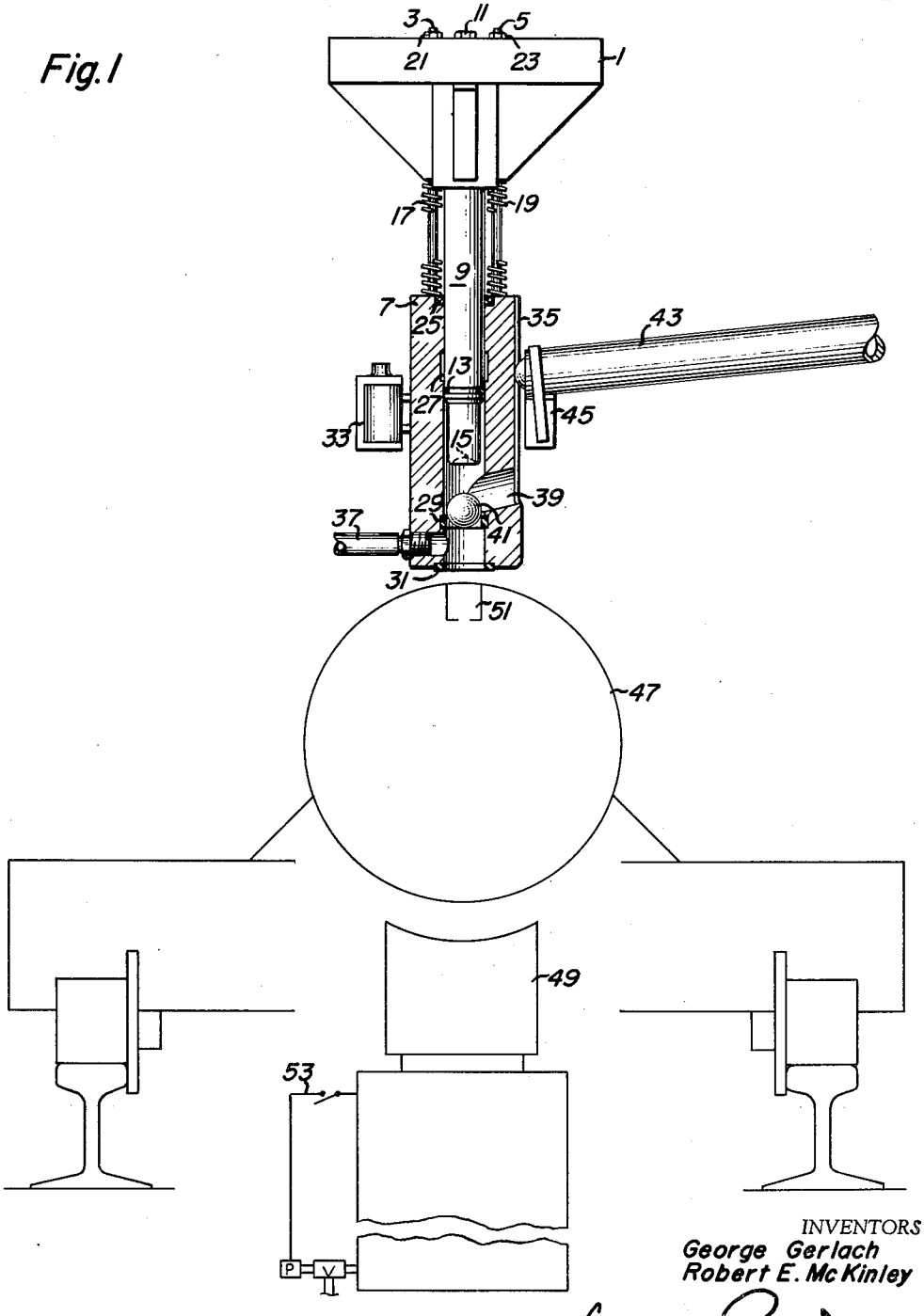
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HYDRAULIC BALL PRESS WITH AUTOMATIC BALL FEED

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Fig. 1



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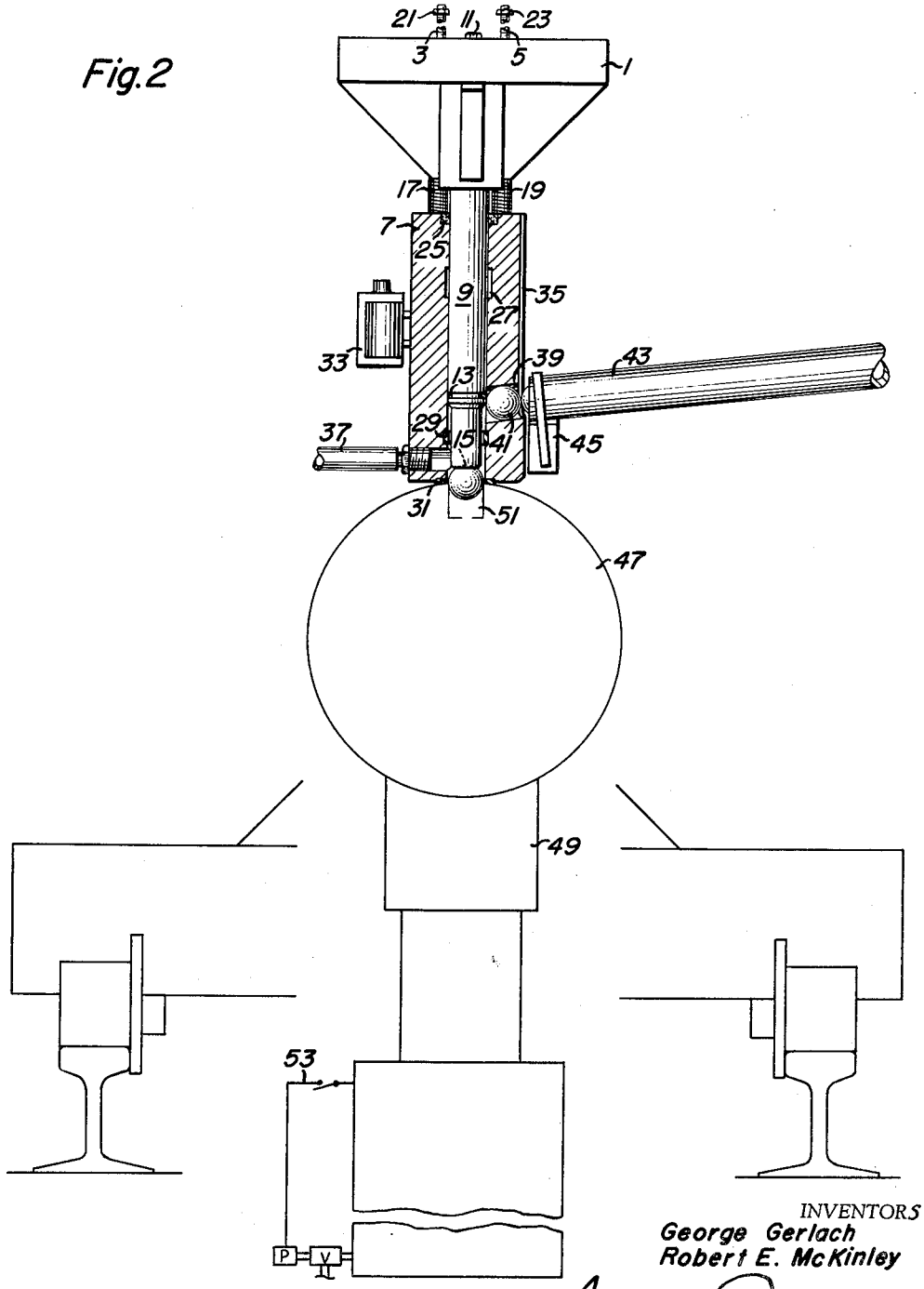
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Fig. 2



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HYDRAULIC BALL PRESS WITH AUTOMATIC BALL FEED

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2 Claims. (Cl. 53—88)

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment to us of any royalty thereon.

This invention relates to a sealing machine of the type which automatically fills and seals containers by way of pressing a hardened steel ball into the filling orifice of the container. The main object of the invention is to provide a sealing machine with a filling head or anvil of the type wherein the filling, sealing, and feeding of the steel balls is done automatically.

Another object is to provide a machine of the kind mentioned capable of operating with certainty and efficiency and having a large output and designed so that it is relatively simple in construction and embracing a minimum number of parts.

In the drawing, FIG. 1 is a sectional view of the pressing machine shown at the beginning stage with diagrammatically shown container and hydraulic ram. FIG. 2 is a sectional view of the pressing machine shown at the sealing stage with diagrammatically shown container and hydraulic ram.

The pressing machine, ordinarily made of metal, embodies a conical anvil support **1** which is rigidly fastened to a suitable frame (not shown). The support **1** at the lower edge has suspended from it by means of four tie rods (only two, **3** and **5** are shown), a cylindrical anvil housing **7**. The anvil housing is slideably mounted on an anvil shaft **9**. Said shaft is fastened at the top to the support **1** by a bolt **11**. The anvil shaft **9** at the mid point has a gasket **13** and at the bottom a spherical indentation **15**. Each of the four tie rods holding the anvil housing **7** are surrounded by compression springs **17** and **19** (only the two mentioned are shown). The springs at the upper stage are mounted inside of the anvil support **1**, while the tie rods slidingly protrude through the top surface of the latter having on their ends self-locking nuts **21** and **23**. At the lower portion, the tie rods are firmly secured to the anvil housing **7**, the springs having their lower ends sunk in relatively deep wells in said housing. Surrounding the shaft **9**, at the top of the anvil housing, there is a seal **25**, and below it, lubricant well **27**, rubber ring **29** and a rubber washer **31**, respectively. On the outer side, the anvil housing has a limit micro switch **33**, arcuate groove **35**, inlet tube **37** and a ball receiving opening **39**. The opening **39** receives ball **41** that has been brought to this point by the tube **43** which is held by a support bracket **45**.

The container sealing cycle begins with the steel ball **41** being held in readiness by the anvil housing rubber ring **29** below the stationary anvil shaft **9**, and with the container **47** being raised by the hydraulic ram **49**. As the

container **47** by way of the ram **49** reaches the anvil housing **7**, it creates a seal with the rubber washer **31**. The container will continue to rise upward until the ball **41** comes in contact with the anvil shaft **9** forming a seal with the anvil housing ring **29**. At this point an inert gas in forced at a predetermined pressure through the inlet tube **37** into the container **47**. When this operation is completed, the ram **49** with the container **47** continues to rise until the ball **41** in contact and cradled in the indentation **15** of the shaft **9** is forced into the filling orifice **51**, thus forming a permanent seal. A high limit switch **53** in the hydraulic line actuated by the micro switch **33** contacting a suitably positioned stop (not shown) determines the end of the pressing operation. The automatic feeding of the ball takes place with the anvil housing in the uppermost position. At this point the opening **39** will receive a ball that has been brought to this point by the tube **43** which is feeding the balls into the anvil housing by gravity. The ball remains in the opening **39** until the hydraulic ram **49** lowers the container **47**. The latter's downward action will simultaneously lower, by means of the springs around the tie rods, the anvil housing **7**. This action will clear the opening **39** allowing the ball **41** to drop onto the anvil housing ring **29** where it is temporarily retained in readiness for the next operation.

Although our invention has been described in connection with specific details of the embodiments thereof, it must be understood that it is not intended to be limited thereto except in so far as set forth in the accompanying claims.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent of the United States is:

1. A sealing machine of the character described having an anvil support, an anvil shaft attached thereto and a hardened steel ball feeding means, said anvil shaft having at its bottom a spherical indentation, a slideable anvil housing suspended by four tie rods, said tie rods being surrounded by compression springs, said anvil housing having a limit switch to limit the upward movement of said housing, said housing having a passageway through one side thereof adapted to admit balls to the center of said housing upon upward movement of the housing past said ball feeding means.

2. An anvil housing for use in a ball sealing machine which comprises a cylindrical body having a central bore adapted to slide on an anvil in sealed relationship, said housing having a lengthwise arcuate groove on the outside thereof, ending in a transverse hole which communicates with the central bore at an acute angle relative to the center line of said body.

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