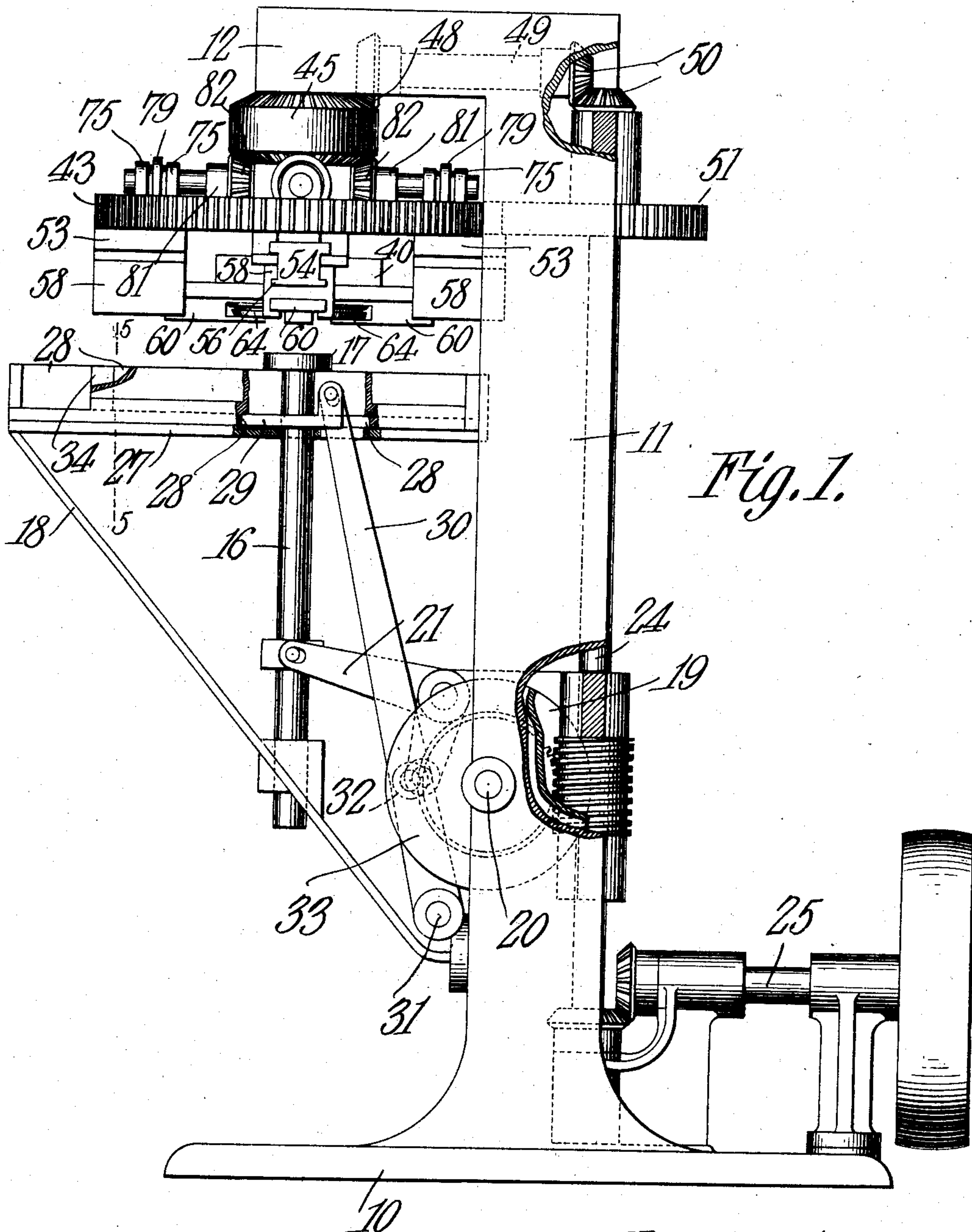


905,801.

H. DIECKS.
CAN SEAMING MACHINE.
APPLICATION FILED MAY 17, 1907.

Patented Dec. 1, 1908.
4 SHEETS—SHEET 1.



WITNESSES:

E. H. [Signature]
John E. [Signature]

Henry Diecks,
INVENTOR

By *C. A. Snow & Co.*
ATTORNEYS

905,801.

H. DIECKS.
CAN SEAMING MACHINE.
APPLICATION FILED MAY 17, 1907.

Patented Dec. 1, 1908.
4 SHEETS—SHEET 2.

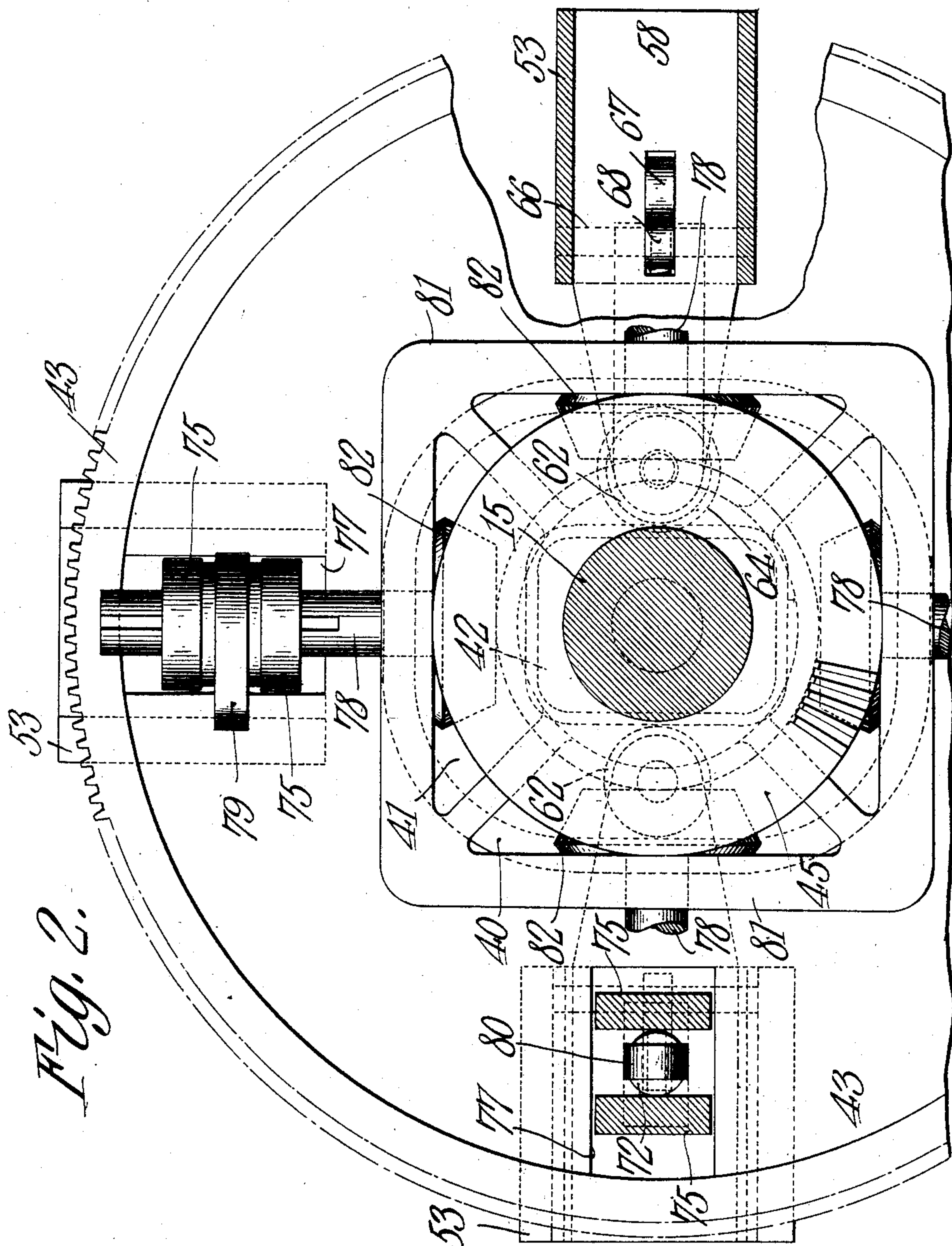


Fig. 2.

WITNESSES:

E. H. Hunt
John E. Parker

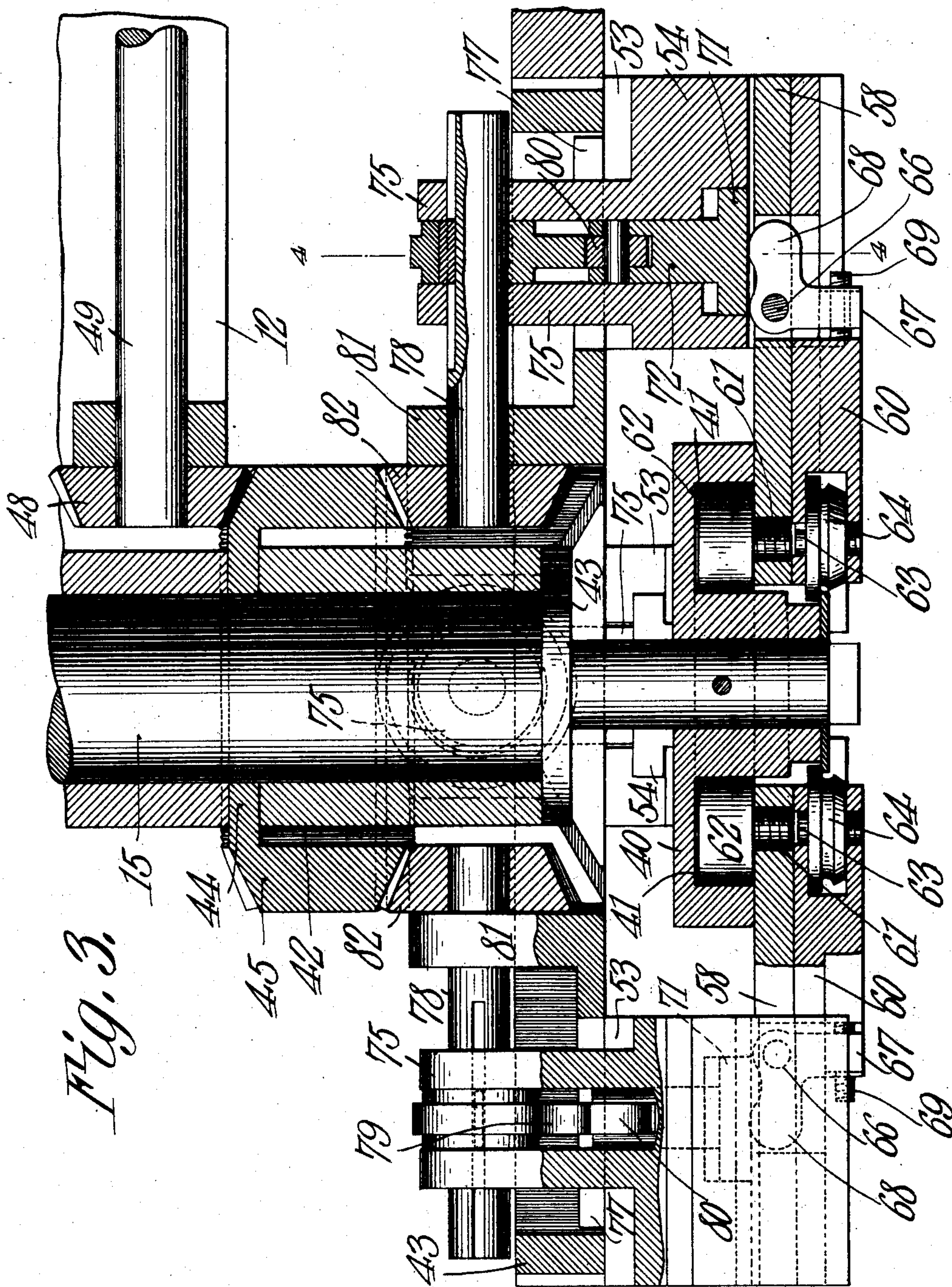
Henry Diecks, INVENTOR.

By *C. A. Snow & Co.*

ATTORNEYS

905,801.

4 SHEETS—SHEET 3.



E. J. Hanna
John Parker

By *C. Knowlton.*

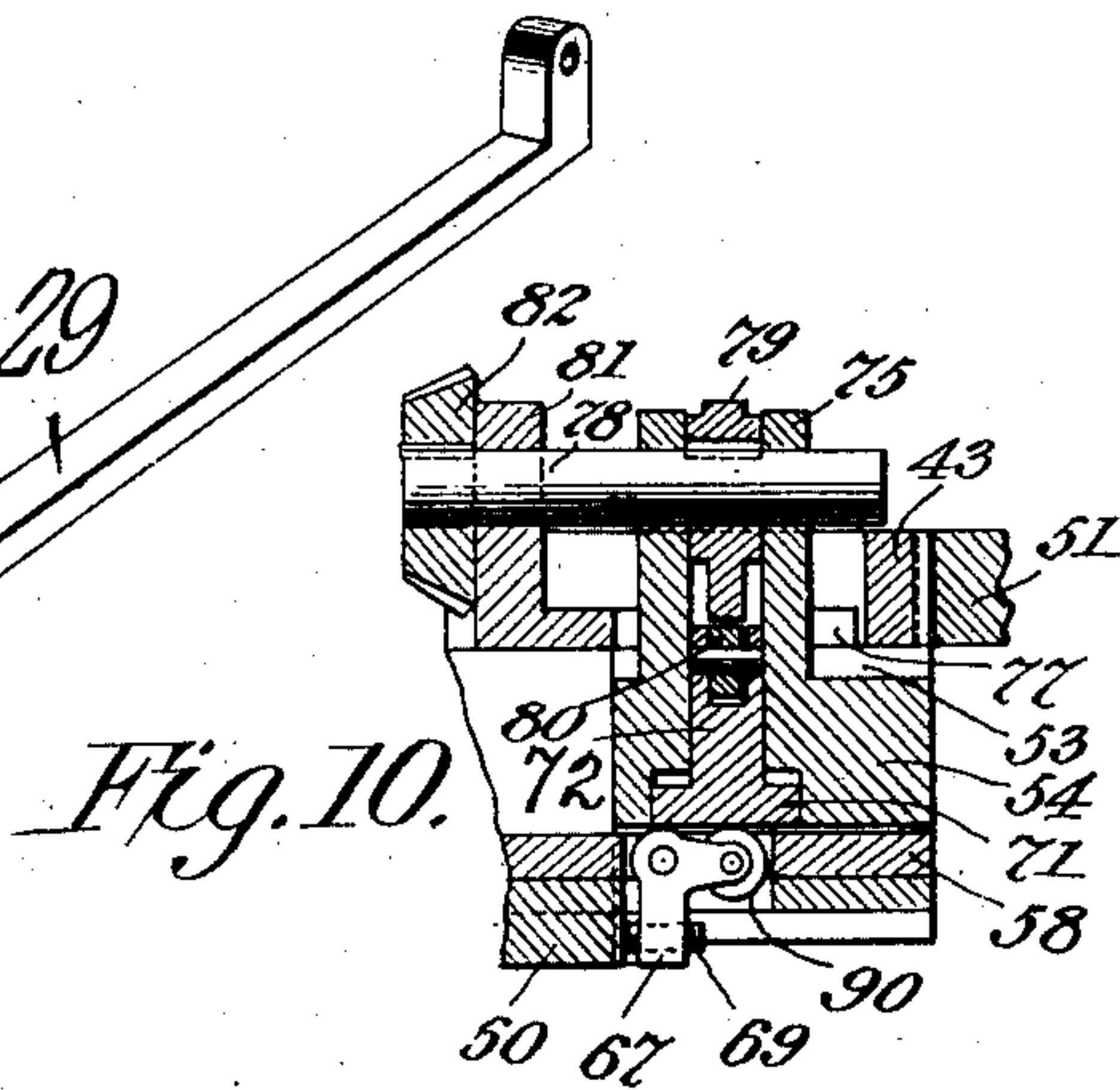
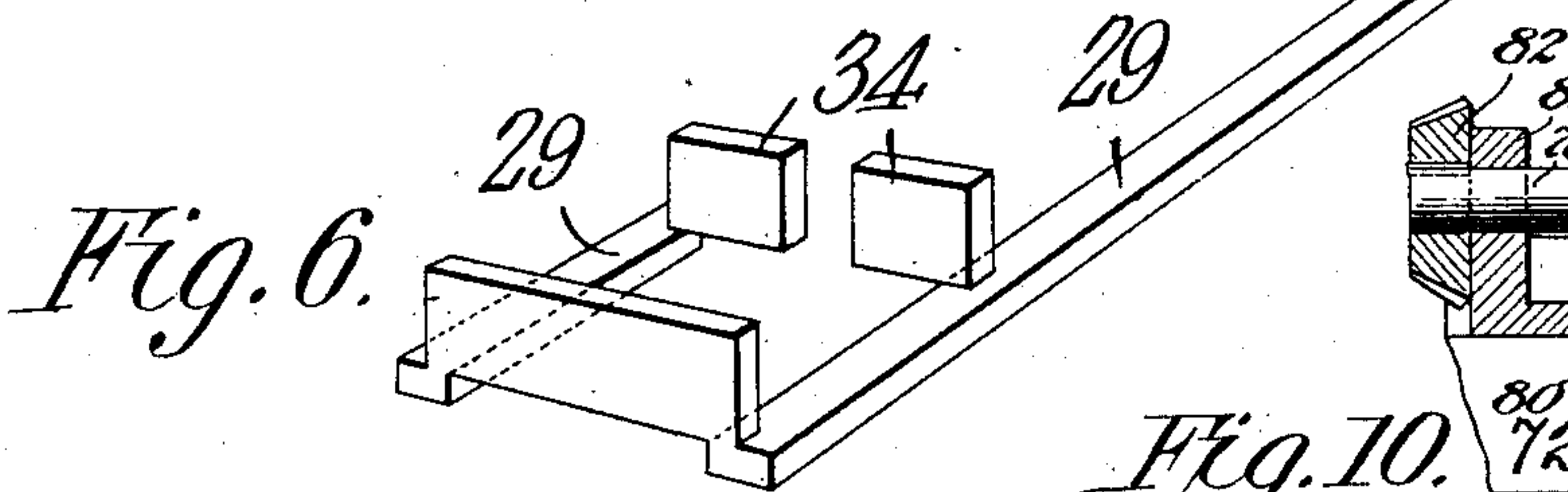
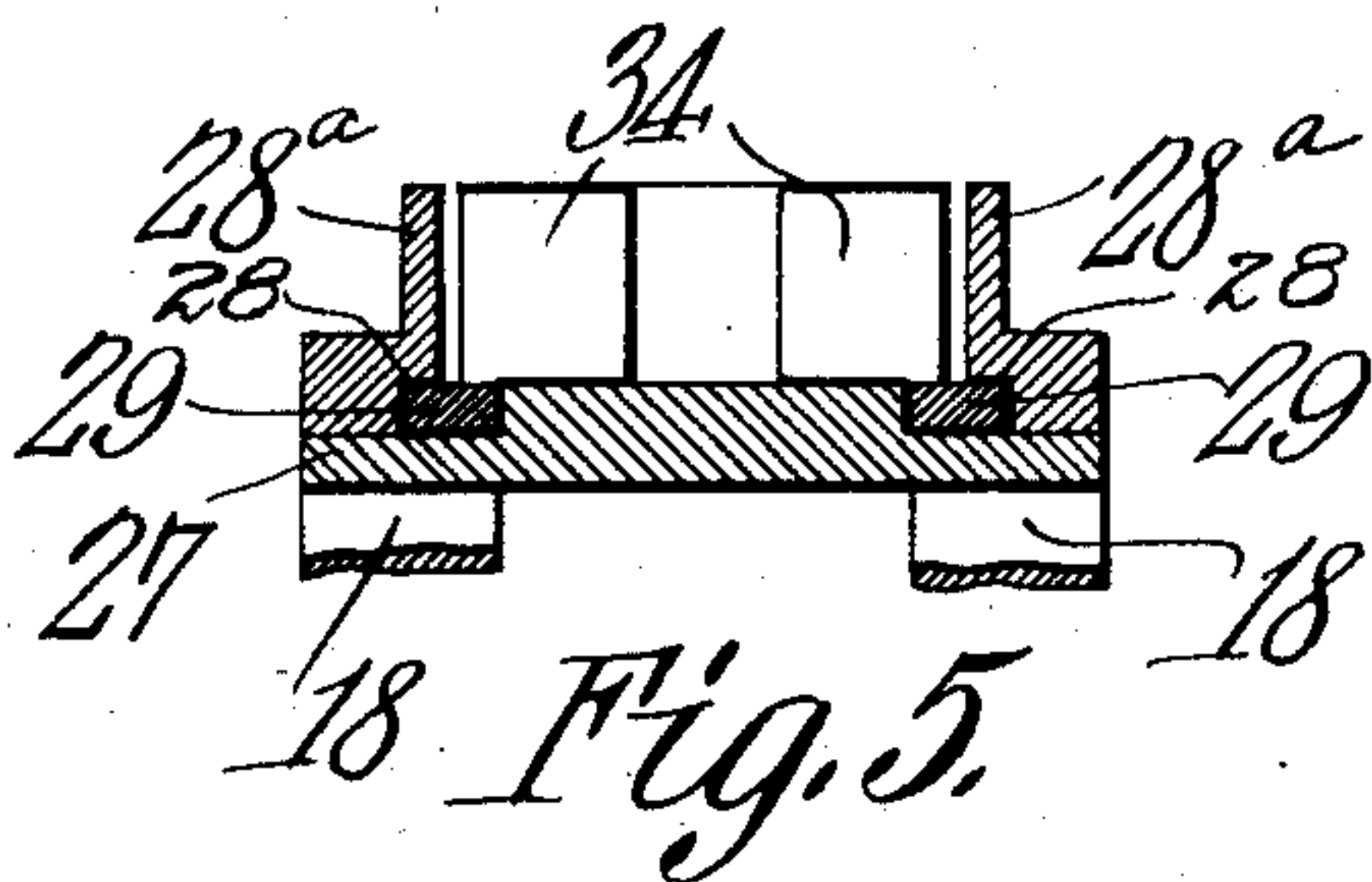
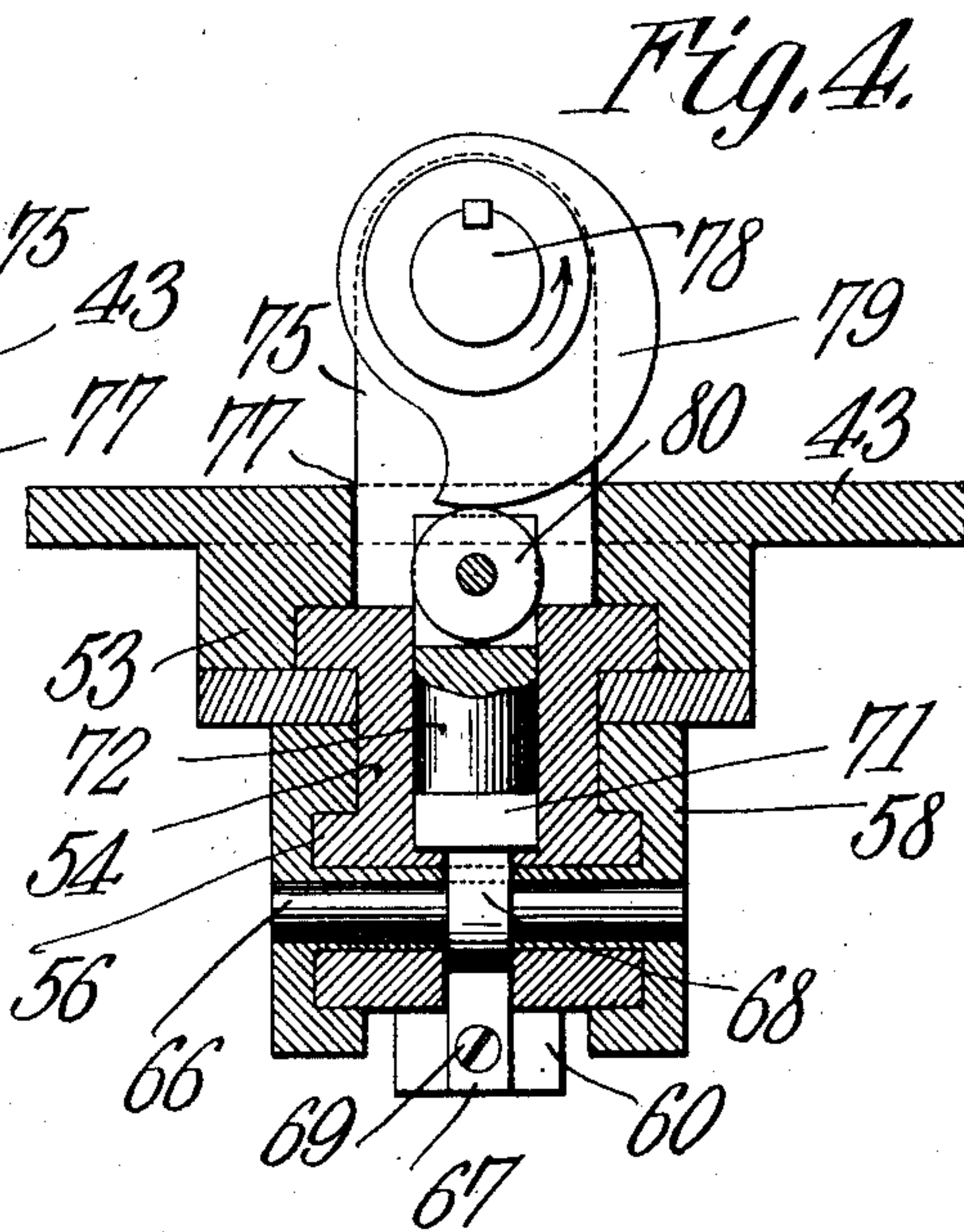
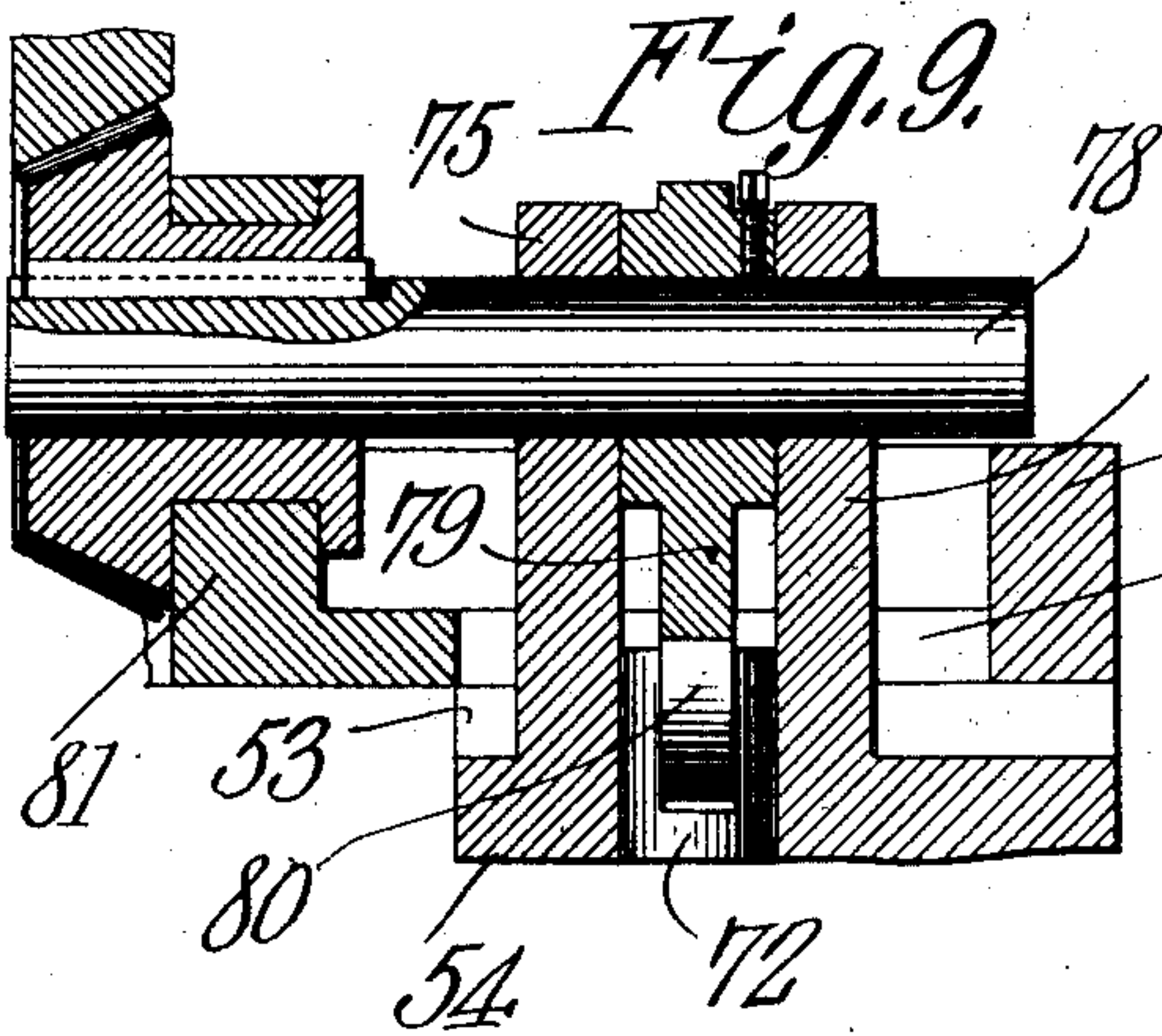
THE NORRIS PETERS CO., WASHINGTON, D. C.

H. DIECKS.
CAN SEAMING MACHINE.
APPLICATION FILED MAY 17, 1907.

905,801.

Patented Dec. 1, 1908.

4 SHEETS—SHEET 4.



WITNESSES:

E. H. Stewart
John S. Parker

Henry Diecks,
INVENTOR.

By *Chas. Snow & Co.*
ATTORNEYS

UNITED STATES PATENT OFFICE.

HENRY DIECKS, OF EASTPORT, MAINE.

CAN-SEAMING MACHINE.

No. 905,801.

Specification of Letters Patent.

Patented Dec. 1, 1908.

Application filed May 17, 1907. Serial No. 374,200.

To all whom it may concern:

Be it known that I, HENRY DIECKS, a citizen of the United States, residing at Eastport, in the county of Washington and State of Maine, have invented a new and useful Can-Seaming Machine, of which the following is a specification.

This invention relates to apparatus employed in the manufacture of cans, and has for its principal object to provide a novel means for securing the bottoms or covers to the bodies of cans by seaming.

A further object of the invention is to provide a machine in which successively operable seaming dies are brought into play during each operation, the preliminary or seaming dies first acting to make the initial turns or folds, and the flattening die or dies then acting to compress and flatten the seam in order to form a fluid proof joint, and these operations being carried on without stopping the machine until the seaming operation is complete.

A further object of the invention is to provide a machine of this type with means for controlling and adjusting the positions of the dies, so that the dies will be progressively advanced toward the work during the seaming operation.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings:—Figure 1 is a side elevation, partly in section, of a can seaming machine constructed in accordance with the invention. Fig. 2 is a sectional plan view through the upper portion of the machine, parts being broken away in order to more clearly illustrate the construction. Fig. 3 is a vertical section through the upper portion of the machine. Fig. 4 is a transverse sectional view through one of the sets of die actuating mechanisms on the line 4—4 of Fig. 3. Fig. 5 is a detail section on the line 5—5 of Fig. 1. Fig. 6 is a detail perspective view of the feed carriage detached. Figs. 7 and 8 are detail views of the dies.

Fig. 9 is a sectional view illustrating a slight modification in the arrangement of the actuating mechanism. Fig. 10 is a detail view of a further modification.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The frame of the machine comprises a suitable base plate 10 from which rises a standard 11 having at the top a horizontally disposed forwardly extending arm 12. The forwardly extending arm 12 is provided with openings for the reception of a vertically disposed spindle 15 which is stationary and which supports the dies, chuck and principal working parts of the machine.

Arranged in vertical alinement with the spindle 15 is a rod 16, at the upper end of which is secured a table 17 on which the can may be placed and elevated to position within the chuck where it is operated upon by the seaming dies. This rod has suitable guides formed in a forwardly extending bracket 18, and is operated from a cam 19 that is mounted on a stud 20 projecting from the standard 11, the cam acting through the medium of a bell crank lever 21, as shown in Fig. 1. The cam is actuated through the medium of worm gearing from a shaft 24 having bearings in the standard 11, the lower end of said shaft having a miter gear connection with a driving shaft 25 that carries suitable belt wheels.

Arranged under the chuck and the seaming dies is a bed or table 27 having vertically arranged parallel side flanges 28^a between which the can body and can top or bottom are placed, the flanges serving to prevent lateral displacement as the work is moved to a position above the lifting table or bed. The side portions of the table 27 are provided with grooves 28 for the reception of a pair of bars 29 forming part of a work carriage, and one of the bars is pivotally connected to the upper end of lever 30, the lower end of said lever being fulcrumed at 31 on a stud carried by the bracket 18, and this lever carries an antifriction roller 32 that is engaged by the cam 33 on the stud or shaft 20.

The work carriage is provided with a pair of spaced work feeding arms 34 extending inward from the side bars 29, and adapted to engage with the can and can top placed on the table 27, and feed the same forward to a position over the lifting table 17. The cams are so arranged that after this feeding movement, the table will be elevated in order to

direct the can parts into the chuck and hold the same in position to be acted upon by the dies. After the feeding movement, the carriage returns to its initial position, it being
 5 noted that the arms 34 are spaced from each other for a distance greater than the diameter of the rod 16, so that the carriage may freely pass the rod, while the table is holding the work in operative position.

10 The lower end of the spindle 15 is of comparatively small diameter, and carries a plate 40 in which is formed a cam groove 41 that corresponds in contour to the can being seamed, the machine in the present instance being designed for the seaming of
 15 sardine cans, and the groove being, therefore, of generally rectangular form with rounded corners. Above the reduced portion of the spindle is of larger diameter, and forms a bearing for the hub 42 of a large
 20 gear wheel 43, said hub being held from downward movement by an annular flange 43 projecting from the spindle; and from upward movement by a hub 44 of a double
 25 bevel gear 45 that is free to turn on the spindle. The teeth at the top of this double bevel gear are engaged by a bevel pinion 48 on the forward end of a shaft 49 that has
 30 bearings in the arm 12 of the frame, and the rear end of said shaft is connected by miter gears 50 to the vertically disposed shaft 24. This shaft 24 is likewise provided with a
 35 pinion 51 that intermeshes with a large gear 43. The gear wheel 43 forms a support for the several seaming dies, and in the present instance four dies are employed, two of
 40 these dies being advance dies for starting the seaming operation, and the other two being finishing dies for completing the operation. The dies are arranged in diametrically
 45 opposed pairs, and provision is made for moving them to and from operative position in successive order, and, also, for gradually feeding the dies forward as the seaming operation progresses.

Depending from the lower face of the gear wheel 43 are four pairs of guides 53, the pairs of guides being spaced at ninety degrees from each other and each pair of guides is arranged
 50 to receive a slidable block 54 that is movable radially toward and from the center of the spindle 15. The lower portion of the block 54 is provided with laterally extended side
 55 flanges 56 that fit within a pair of grooves formed in a slide 58, and the inner faces of the lower wall of said slide 58 are grooved for the reception of the opposite sides of a die
 60 carrying slide 60 that is movable with the slide 58, and also has independent movement thereof.

The inner end of the slide 58 carries a stud 61 on which is mounted an anti-friction roller 62 arranged to travel in the cam groove 41 for the purpose of causing the slides to follow
 65 the contour of the can. The lower slide 60

is provided with a stud 63 carrying a die 64, said die being caused to travel in a path conforming to the contour of the can by the roller 62, and being gradually moved inward as the seaming operation progresses, this
 70 movement being independent of the movement of the roller.

The three members 54, 58 and 60 are connected together by a stud or bolt 66, on which is mounted a bell crank lever having
 75 two arms 67 and 68. The arm 67 is tapped for the reception of a screw 69 which engages with the slide 60, while the arm 68 is rounded, and is engaged by the enlarged head 71 of a
 80 vertically movable stud 72 mounted in the slide bar 54. Extending upward from the block 54 are spaced ears or lugs 75 which, also, pass through an opening 77 formed in the web of the large gear 43. These ears or
 85 lugs form bearings for a shaft 78 which carries a cam 79, the latter acting on an anti-friction roller 80 that is mounted at the upper end of the stud 72. The cam is feathered to the shaft, so that the block 54,
 90 the ears 75 and the cam are free to move in a radial path toward and from the axis of the spindle 15. The inner end of the shaft passes through a bearing opening formed in a
 95 vertically extending rectangular web 81 that rises from the body portion of the bed 43, and to the extreme inner end of said shaft is secured a bevel pinion 82 that intermeshes with the lower set of teeth of the
 100 double bevel gear 45.

The construction of the parts is such that
 105 as the gear wheel 45 rotates, it will carry with it the members 54, 58 and 60, and these will follow the contour of the cam groove 41, while the bell crank lever, the stud 72 and cam 79 will be retained in constant vertical
 110 alinement with each other, the cam sliding on the shaft 78 and at all times rotating therewith as the bevel gear 82 is rotated.

In operation, the can parts are placed on the table 27, and are engaged by the carriage
 115 and moved rearward to a position over the small lifting table 17 which moves upward carrying with it the can and the can top or bottom to a position within the chuck, all of the dies at this time being withdrawn to in-
 120 operative position. During the rotation of the gear wheel 43, the advance dies will be moved inward as their cams 79 rotate, it being understood that the gear wheel 43 rotates from six to twelve times for the seam-
 125 ing of each can, and during about half the number of revolutions the advance dies are fed inward in order that the seam may be gradually formed. At the end of about half the number of revolutions, the working ends
 130 of the cams pass beyond the studs 72 of the advance seaming dies, and the latter are retracted. The finishing dies are then moved up by their cams 79 and are constantly fed forward by said cams until the seaming op-
 135

eration is complete, and at the completion of the operation, the active faces of the cams pass beyond the actuating studs of the dies and allow the latter to move under centrifugal action to inoperative position, so that the can body, properly seamed, is allowed to descend with the table. The finished can is allowed to rest on the table 27 and is forced out of the way as another can is fed to the machine.

Instead of arranging the cam 79 to slide on its shaft, the cam may be fixed to the shaft and the shaft feathered to the gear 82, as shown in Fig. 9, or in some cases the shaft may be keyed to both the gear and to the cam in which case the block 54 may be held rigidly to the gear 43, and the lever arm 68 will be provided with a roller 90 to engage a plate 71 as shown in Fig. 10, or the construction may be otherwise modified for the purpose of securing a gradual forward feed of the seaming dies in addition to the mechanism for maintaining the dies in proper position with respect to the contour of the can body.

The cam groove 41 may be made of any desired shape in accordance with the character of cans to be made, and the block 40 may be detachable in order that blocks having cam grooves of different contour or different dimensions may be substituted in case cans of different shape or size are to be made.

I claim:—

1. In a can seaming machine, the combination with a can support, of a stationary member having a guiding groove of a contour corresponding to that of the can to be seamed, a revoluble support, a radially movable slide mounted on said revoluble support having a member entering said guiding groove of said stationary member, a die carrying slide movable with said first slide, a bell crank lever carried by said first mentioned slide and arranged to transmit movement to the die carrying slide and a cam for actuating said bell crank lever, substantially as specified.

2. In a can seaming machine, the combination with a can support, of a stationary member having a guiding groove corresponding to that of the can to be seamed, a revoluble support, a plurality of radially movable slides carried by said revoluble support and each having a member entering said guiding groove of said stationary member, and die carrying slides supported by said radially movable slides and an independent cam on said revoluble support for actuating each die carrying slide, substantially as specified.

3. In a can seaming machine, a can support, a member provided with a groove of a contour corresponding to that of the can, a slide carrier, a plurality of slides supported thereby, a plurality of die carrying slides

each supported by one of the first named slides, an independent cam for actuating each die carrying slide, independent supporting shafts for said cams, and means for actuating said shafts.

4. In a can seaming machine, a can support, a member provided with a guiding groove of a contour corresponding to that of the can, a slide support, a plurality of slides mounted therein and provided with members entering said groove, a die carrying slide mounted in each of the first-named slides, a separate bell-crank lever carried by each of the first-mentioned slides and bearing against the die carrying slides, a series of cam shafts, actuating means therefor, independent cams on said shafts, and means for transmitting movement from the cam to each bell crank lever.

5. In a can seaming machine, a can support, a revoluble gear arranged above said support and provided with a plurality of radially arranged openings, a bevel gear, the axes of the two gears being coincident, means for actuating the gears, a plurality of shafts carried by the first gear and having bevel pinions intermeshing with the bevel gear, cams on said shafts, a slide block mounted in guides in the main gear and provided with shaft supporting lugs, between which the cams are disposed, a slide supported by the block, a roller on said slide, a stationary member having a guiding groove for the reception of the roller, a plurality of sets of consecutively operable seaming dies, die carrying slides mounted on the guiding slides, bell crank levers carried by the blocks, one arm of each bell crank lever being arranged to engage a die carrying slide, a vertically guided stem mounted in the block and engaging the opposite arm of the bell crank lever, and a roller arranged at the upper end of the stem and with which the cam engages.

6. In a can seaming machine, a can support, a revoluble gear, means for turning the same in one direction, a plurality of dies supported by the gear, cams for feeding said dies toward the work, shafts supported by the gear and carrying the cams, bevel pinions on said shafts, a double bevel gear, the axis of which is coincident with that of the main gear, one set of teeth of the double bevel gear engaging the bevel pinions, and a driven bevel pinion intermeshing with the other set of teeth of the double bevel gear and rotating the same in the same direction as the main gear but at a different speed.

7. In a can seaming machine, a frame, a stationary spindle carried by the frame, a block secured to the free end of the spindle and having a cam groove, a gear mounted on the spindle at a point above the block, said gear having a plurality of radially arranged openings, and being provided with

an approximately rectangular flange near its hub, a series of shafts arranged radially of the gear and extending through openings in the flange, cams on said shafts, blocks disposed in guides that are carried by the gears, ears or lugs carried by the blocks and projecting through said openings, said ears or lugs fitting on both sides of the cam and provided with openings for the reception of the shaft, slides guided by the blocks and provided with antifriction rollers entering the cam groove, a bell crank lever fulcrumed to each block, a stem guided in each block and arranged to be engaged by a cam, said stem bearing on one arm of the bell crank lever, a plurality of seaming dies, a carrying slide for each guide, said carrying slide being mounted in the guiding slide and being acted upon by the second arm of the bell crank lever, a work support, and means for raising and lowering said work support.

8. In a machine of the class described, seaming means, a table on which the cans may be placed, a work elevating table, a rod carrying the same and extending through the work receiving table, and a reciprocating feeding carriage having a pair of spaced arms at its forward end to permit rearward movement of the carriage past the rod when the lifting table is raised.

9. In a can seaming machine, the combination with a can support, a stationary member provided with a groove of a contour corresponding to that of the can to be seamed, a radially sliding carrier, a plurality of slides supported thereby, a plurality of die carrying slides each supported by one of the first named slides, an independent cam for actuating each die carrying slide, independent supporting shafts for said cams, means for actuating said shafts and a reciprocating feed carriage for the cans, substantially as specified.

10. In a can seaming machine, the combination with a can support, a stationary member provided with a groove of a contour corresponding to that of the can to be seamed, a radially sliding carrier, a plurality of slides supported thereby, a plurality of die carrying slides each supported by one of the first named slides, an independent cam for actuating each die carrying slide, independent supporting shafts for said cams, means for actuating said shafts, a reciprocating feed carriage for the cans and means for reciprocating said can support, substantially as specified.

11. In a can seaming machine, the combination with a vertically movable can support, and means for feeding the cans thereto, of a stationary member provided with a guiding groove of a contour corresponding to that of the can, a rotating slide carrying support, a plurality of radially movable slides carried thereby, furnished with rollers engag-

ing said guiding groove of said stationary member, a plurality of seaming die carrying slides mounted to reciprocate in respect to said first mentioned slides, bell crank levers for operating said die carrying slides and independent cams on radially arranged shafts for operating said bell crank levers, substantially as specified.

12. In a seaming machine, the combination with a vertically-movable can support, of means for feeding the cans thereto, a stationary contour cam, a rotary slide carrier, a plurality of radially movable slides on said carrier having rollers engaging said stationary contour cam, a radially movable die carrying slide for each of said first mentioned slides, a lever for operating each of said die carrying slides and a cam shaft and connections for actuating each of said levers, substantially as specified.

13. In a seaming machine, the combination with a stationary can support, of a stationary contour cam 40—41, a revolving carrier 43, a plurality of radially movable seaming tool carrying slides 60, a plurality of slides 58 having rollers 62 engaging said contour cam, a plurality of slides 54, a plurality of cam shafts 78 furnished each with a cam for actuating the tool carrying slide 60, substantially as specified.

14. In a seaming machine, the combination with a stationary can support, of a stationary contour cam 40—41, a revolving carrier 43, a plurality of radially movable seaming tool carrying slides 60, a plurality of slides 58 having rollers 62 engaging said contour cam, a plurality of slides 54, a plurality of cam shafts 78 furnished each with a cam for actuating the tool carrying slide 60, a plurality of sliding studs 72 and a plurality of bell crank levers interposed between said sliding studs 72 and said tool carrying slides 60, substantially as specified.

15. In a seaming machine, the combination with a stationary can support, of a stationary contour cam 40—41, a revolving carrier 43, a plurality of radially movable seaming tool carrying slides 60, a plurality of slides 58 having rollers 62 engaging said contour cam, a plurality of slides 54, a plurality of cam shafts 78 furnished each with a cam for actuating the tool carrying slide 60, a plurality of sliding studs 72 and a plurality of bell crank levers interposed between said sliding studs 72 and said tool carrying slides 60, said bell crank levers each having a roller engaging said sliding studs 72, substantially as specified.

16. In a seaming machine, the combination with a stationary can support, of a stationary contour cam 40, 41, a revolving carrier 43, a plurality of radially movable seaming tool carrying slides 60, a plurality of slides 58 having rollers 62 engaging said contour cam, a plurality of slides 54, a plurality

of cam shafts 78 furnished each with a cam for actuating the tool carrying slide 60, a plurality of sliding studs 72 and a plurality of bell crank levers interposed between said sliding studs 72 and said tool carrying slides 60, said bell crank levers each having an adjusting screw 69 engaging said tool carrying slide 60, substantially as specified.

17. In a seaming mechanism, the combination with a can support, of a stationary contour cam, a rotary carrier and a plurality of sets of cooperating slides 54, 58, 60 and 72 and a plurality of radially arranged cam shafts furnished with cams for actuating each die carrying slide 60 through said slide 72, substantially as specified.

18. In a seaming mechanism, the combination with a can support, of a stationary contour cam, a rotary carrier and a plurality of sets of cooperating slides 54, 58, 60 and 72 and a plurality of radially arranged cam shafts furnished with cams for actuating each die carrying slide 60 through said slide 72, and a bell crank lever interposed between said slide 72 and said slide 60, substantially as specified.

19. In a seaming mechanism, the combination with a can support and a stationary contour cam, a rotary carrier having a plurality of groups of cooperating slides 54, 58, 60, a horizontally extending radially arranged cam shaft for each of said groups of slides, a cam on said cam shaft and connecting mechanism for operating the tool carrying slide 60 from said cam, substantially as specified.

20. In a seaming mechanism, the combination with a vertically movable can support, of a stationary contour cam, a rotary carrier, a plurality of radially movable slides furnished with rollers engaging said contour cam, a plurality of tool carrying slides 60, a plurality of sliding blocks 54, a plurality of vertically sliding studs 72, a plurality of cam shafts 78 having cams, and a plurality of bell crank levers, one interposed between each tool carrying slide 60 and each vertically movable sliding stud 72, substantially as specified.

21. In a seaming mechanism, the combination with a vertically movable can support, of a stationary contour cam, a rotary carrier, a plurality of radially movable slides furnished with rollers engaging said contour cam, a plurality of tool carrying slides 60, a plurality of sliding blocks 54, a plurality of vertically sliding studs 72, a plurality of cam shafts 78 having cams, and a plurality of bell crank levers, one interposed between each tool carrying slide 60 and each vertically movable sliding stud 72, each of said bell crank levers having a roller engaging said sliding stud 72, substantially as specified.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

HENRY DIECKS.

Witnesses:

FRANK C. JEWETT,
J. H. McFAUL.