

E. V. SWANGREN.
CAN BODY MAKING MACHINE.
APPLICATION FILED FEB. 11, 1907.

975,655.

Patented Nov. 15, 1910.

4 SHEETS—SHEET 1.

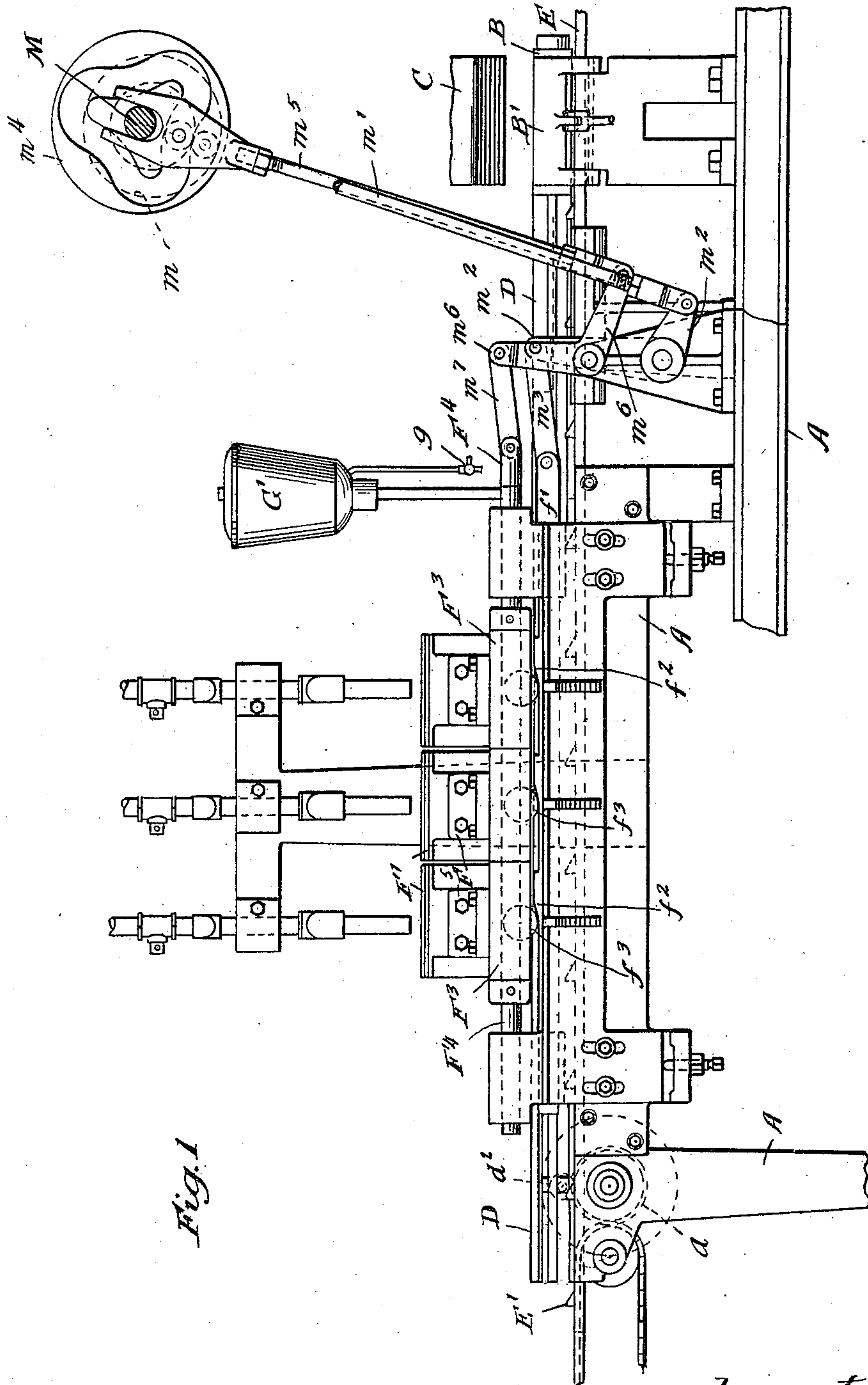


Fig. 1

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Edwin V. Swangren

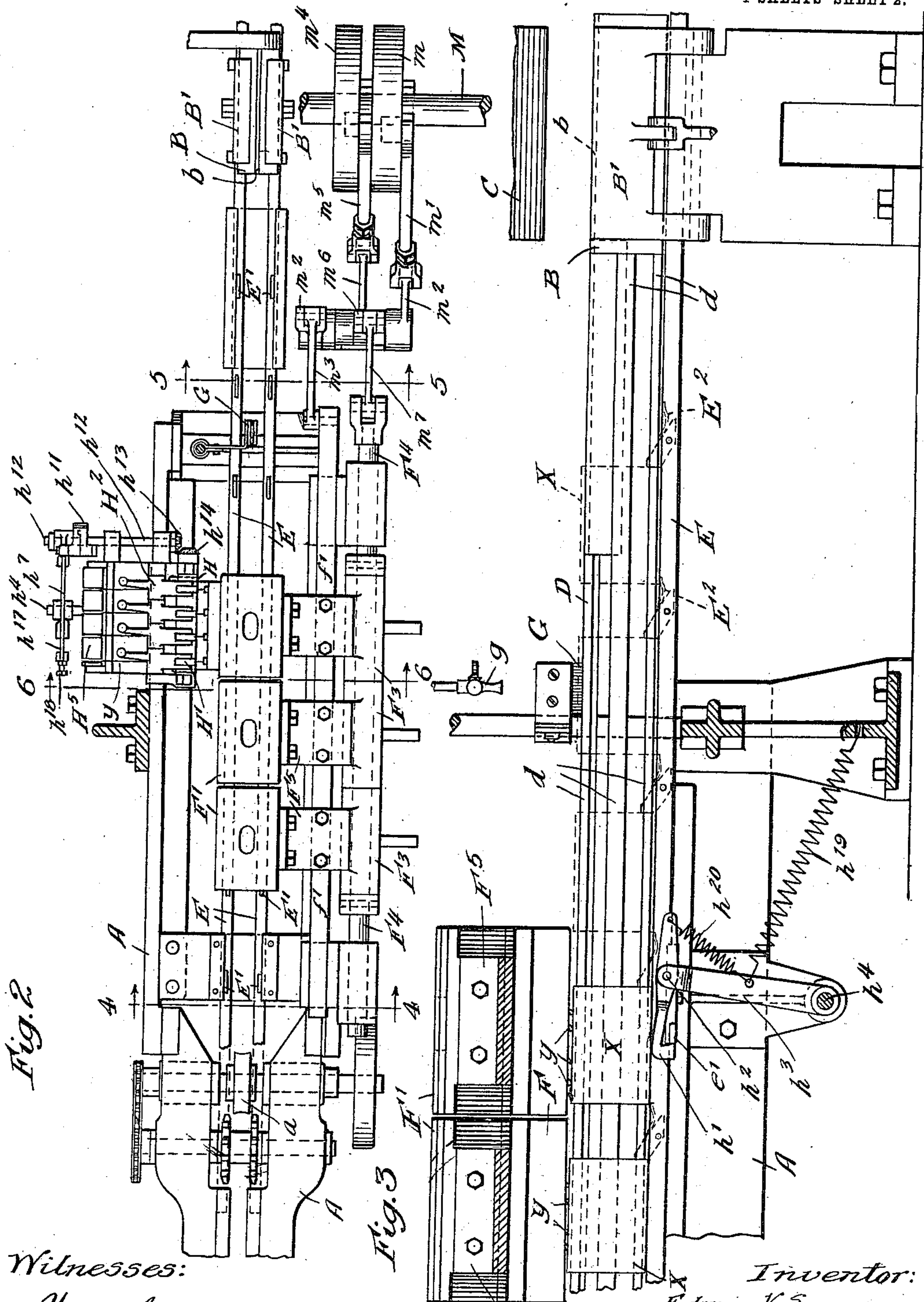
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 4.

Fig. 6

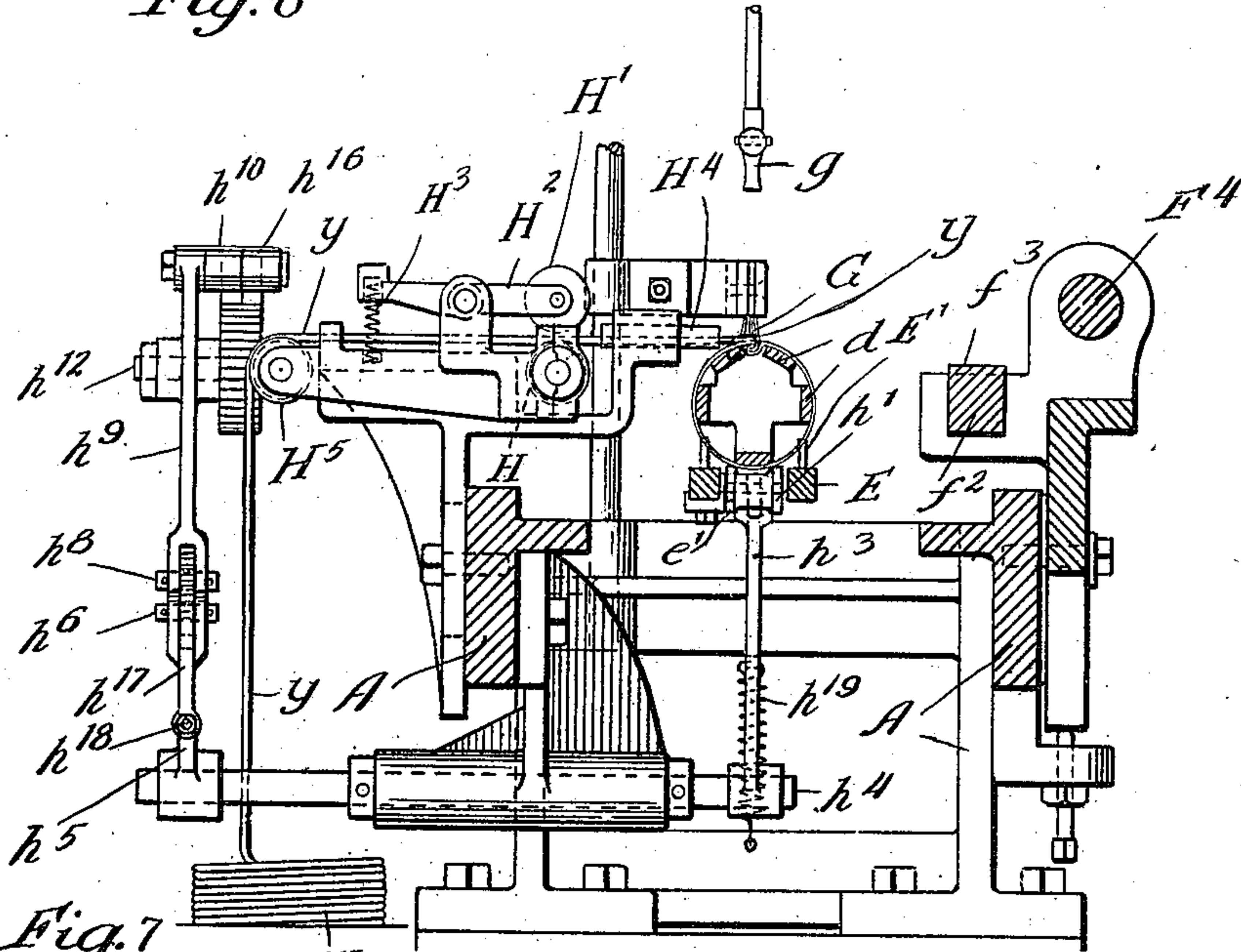


Fig. 7

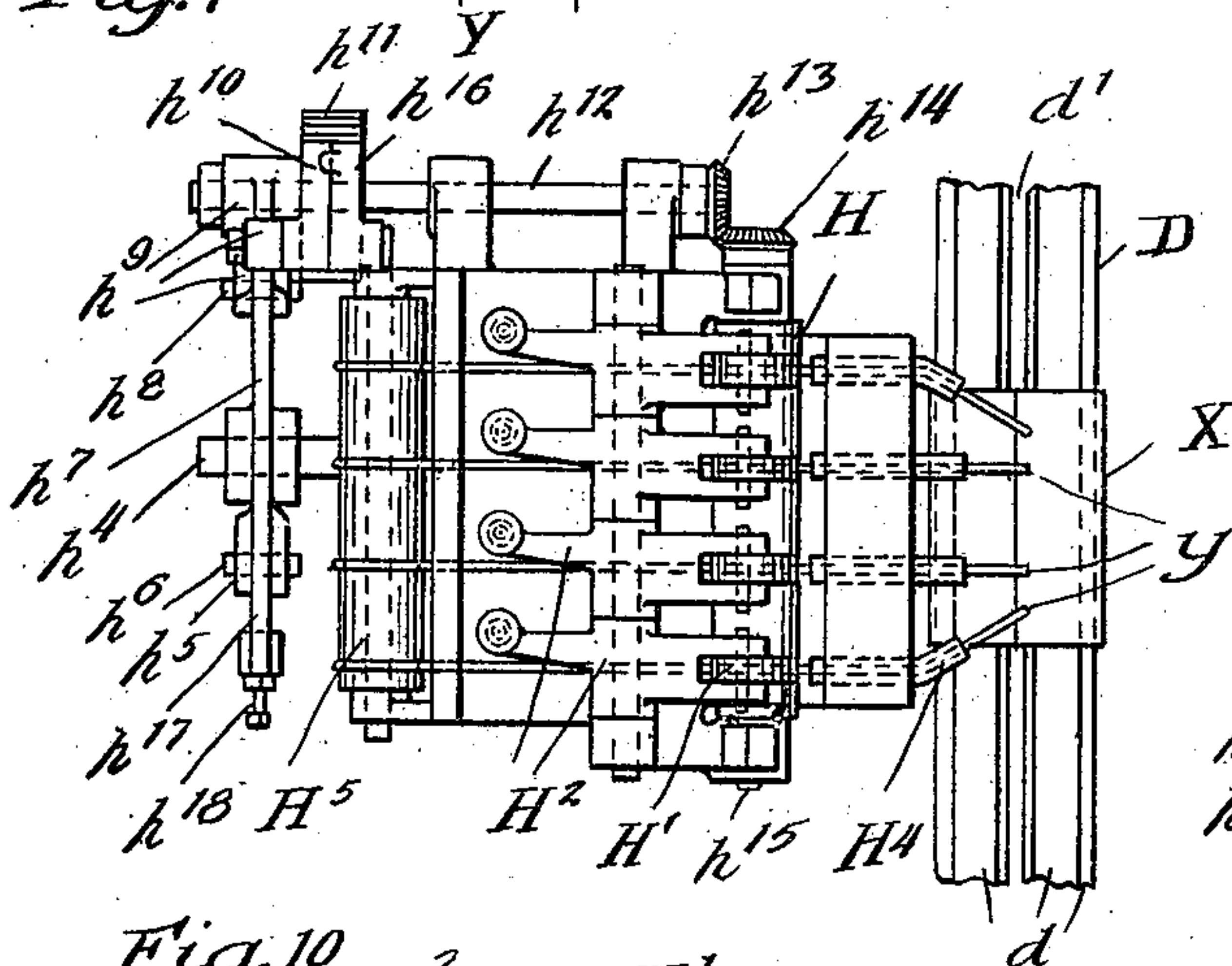


Fig. 10

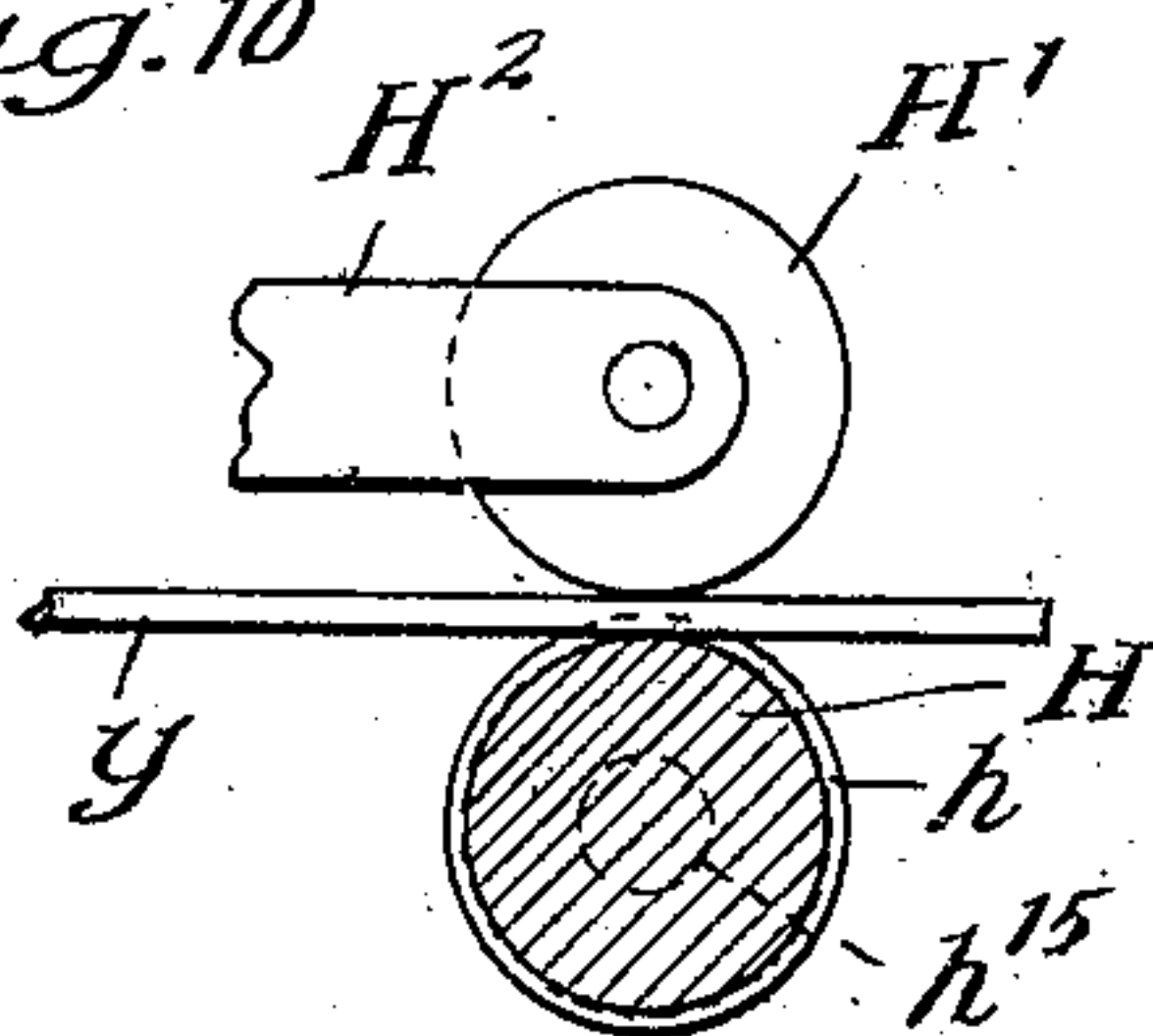
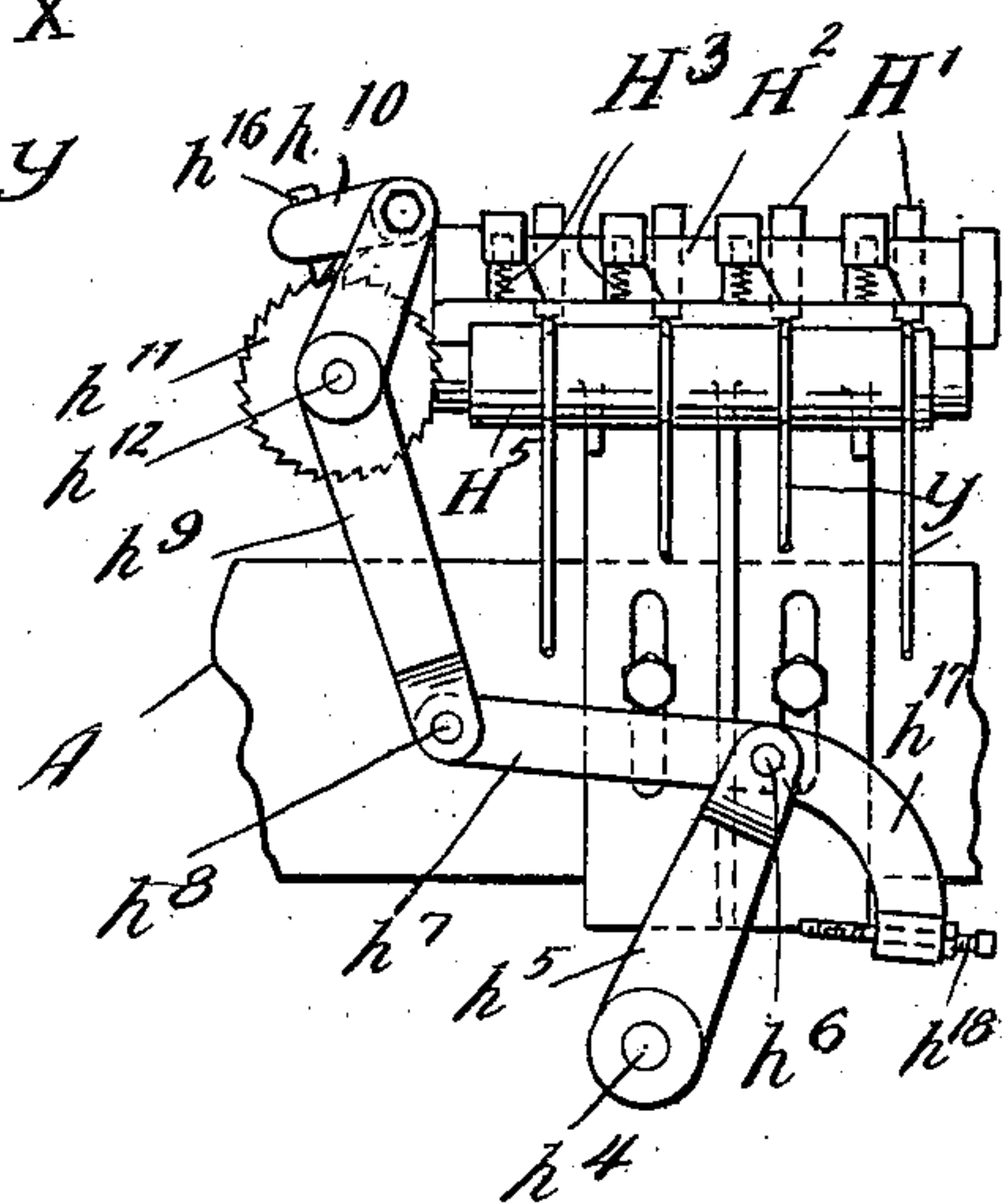


Fig. 8



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UNITED STATES PATENT OFFICE.

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CAN-BODY-MAKING MACHINE.

975,655.

Specification of Letters Patent.

Patented Nov. 15, 1910.

Application filed February 11, 1907. Serial No. 356,706.

To all whom it may concern:

Be it known that I, EDWIN V. SWANGREN, a citizen of the United States, residing in Maywood, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Can-Body-Making Machines, of which the following is a specification.

My invention relates to improvements in can body machines, and more particularly to improvements in the side seam soldering mechanism of lock seam can body making machines.

In automatic lock seam can body making machines heretofore in use, the lock seam of the can body is customarily soldered by moving the can body continuously along a soldering horn extending from the body former horn so that the side seams of the can bodies will come in engagement with one or more soldering irons or shoes mounted above the soldering horn and closely adjacent thereto or resting thereupon, or else by moving the can bodies continuously along over a soldering bath or soldering devices mounted beneath the path of the can bodies and with which the side seams of the can bodies come in contact as the can bodies are fed or moved continuously over the soldering horn. In can body machines of both these types, the inside surface of the can body at the side seam is more or less coated or smeared with solder which is objectionable, rendering the cans more or less unfit for use as preserving cans for many food products, and also because of the large amount of solder required in soldering the seams as the solder coating or smearing on the inside surface of the can body adjacent to the seam adds nothing to its strength or security. In that type of machines which employ the solder bath or molten solder applying devices below the path of the moving can bodies, a short arc of the can body adjacent to the side seam is ordinarily immersed in the molten solder, or the molten solder is caused to flow upon the inside of the seam. And in the other type of machines in which the soldering is done from above, the solder, whether fed or applied in wire form or in a molten form from a solder pot, is applied to the can bodies as they are moved along the soldering horn under the soldering iron, and the molten or melted solder flows through the seam and gets upon the soldering horn be-

neath the seam and tends to smear or coat the inside surface of the can body adjacent to the seam as the same slides along the horn.

The object of my invention is to provide an improved construction of lock seam can body making, or can body forming and soldering machine in which the soldering of the side seams may be done rapidly and economically or with a minimum amount of solder and by which the inside surface of the can bodies, either adjacent to the seam or elsewhere, will not be coated or smeared with the solder.

My invention consists in the means I employ to practically accomplish this object or result. That is to say, it consists in connection with the former horn, body formers and bumper, of a lock seam can body machine and a soldering horn extending therefrom, of an intermittently moving feeder or carrier for advancing the can bodies along the soldering horn by a step by step movement, and one or more, preferably a plurality of vertically movable and horizontally reciprocating soldering irons or shoes operating upon the side seams of the can bodies while the same are stationary or at rest, and one or more, preferably a plurality of solder feeders, preferably solder wire feeders, operating to feed or apply the solder to the can body while it is at rest, the soldering horn having a slot or cut away portion under the soldering iron or shoe so that the soldering horn itself will not become coated or smeared with molten solder. In practice, the solder wire feeders feed measured lengths of solder wire under the face of the soldering iron or shoe while the same is in its raised position, the hot soldering iron or shoe melting the portions of the solder wires beneath it as it moves downward into contact with the side seam of the can body on the soldering horn.

My invention also consists in the novel construction of parts and devices and in the novel combinations of parts and devices herein shown and described.

In the accompanying drawing forming a part of this specification, Figure 1 is a side elevation of a lock seam can body making machine embodying my invention, the same, however, showing only that portion of the completed machine to which my invention particularly applies. Fig. 2 is a plan view

with soldering horn removed. Fig. 3 is a detail longitudinal section partly in elevation. Figs. 4, 5 and 6 are vertical sections on lines 4—4, 5—5 and 6—6 of Fig. 2. Fig. 7 is a detail plan view showing the wire solder feed devices, and Fig. 8 is a detail elevation of the wire solder feed devices shown in Fig. 7. Fig. 9 is a detail view of parts hereinafter described; and Fig. 10 a detail section showing the wire solder feed rolls.

In the drawing, A represents the frame of a lock seam can body making machine, B the body former horn, B¹ the body formers or devices for wrapping the flat can body blank around the horn and C the bumper. These parts may be of any well known kind or construction commonly in use and familiar to those skilled in the art.

D is the soldering horn extending from the end of the body former horn B and upon which the can bodies are supported and guided as they pass off the body former horn B and are conveyed along to the fluxing and soldering devices. The soldering horn D is preferably of a skeleton form and made up of parallel bars *d* with an open space of slot *d*¹ between the two uppermost bars *d*. This longitudinally extending open space *d*¹ registers with the lock side seam groove *b* of the body former horn B and the width of this slot *d*¹ is wider than the lock seam *x* of the can body X, and preferably somewhat wider than the thickness of the face *f* of the vertically movable and horizontally reciprocating soldering irons or shoes F so that the soldering horn will not come in contact with the soldering iron or shoe F whether a can body is present or not beneath the soldering iron and so that the soldering horn will not operate to draw the melted solder through the lock seam onto the inner surface of the can body, or to smear such inner surface of the can body with solder by reason of the soldering horn itself becoming smeared with the solder from the soldering iron above. The inner end of the soldering horn D is connected to and supported from the body former horn B. Its outer end is preferably furnished with a roller *d*² and rests upon the horn supporting roller *a* on the frame A of the machine so that the soldered can bodies can pass off the horn.

The soldering irons or shoes F are preferably three in number and are mounted so as to be capable of a slight up and down movement to enable the can bodies to be advanced along the horn beneath them by an intermittent or step by step movement, and are given a horizontally reciprocating movement in the direction of the can bodies to properly heat the seam and sweat the solder into the same.

E is an intermittently moving can body

feeder or carrier by which the can bodies are moved intermittently or by a step by step movement along the soldering horn from the body former horn B. This intermittently moving or step by step carrier for the can bodies consists preferably of a pair of reciprocating feeder bars furnished with a series of fingers or pawls E¹ for engaging and pushing the can bodies along, the pawls or fingers E¹ preferably having springs E² to enable the pawls or fingers to close out of the way when the reciprocating pusher bars make their backward or return stroke.

G is the fluxing device, the same being preferably mounted on the frame of the machine above the soldering horn and consisting of a brush or pad arranged in the path of the side seams of the can bodies as they are moved along the soldering horn and upon which acid or other suitable flux is fed from the flux tank G¹ through a nozzle *g*.

H is the solder feeder or device by which the solder in measured quantity is fed to the seam of each can body while it is at rest on the horn under the first soldering iron or shoe F. The solder is preferably fed or applied in the form of wire solder, and the feeder H preferably consists of a feed roll suitable for feeding this form of solder. The wire solder feed device H is preferably furnished with a plurality of grooves *h* for feeding a plurality of solder wires *y* from the solder wire reels or spools Y. To give the wire solder feed device or roll H the requisite grip upon the solder wires, I provide a plurality of cooperating solder feed rolls H¹, each mounted upon an arm or lever H² and furnished with a spring H³ to press the roller H¹ against the solder wire and feed roll H. The solder wires *y* pass through wire solder guides H⁴ which serve to guide or direct the ends of the solder wires between the soldering iron F and the side seam of the can body to be soldered which is on the soldering horn D below the first soldering iron F so that when this soldering iron F is again lowered against the seam, the portions of the solder wire which are fed or projected under the soldering iron will be melted thereby. The solder wires *y* pass from the spools Y over a guide roller H⁵.

Each of the vertically movable and horizontally reciprocating soldering irons F is furnished with a heating chamber F¹ and is secured to an arm F² having a pivotal or hinged connection F³ with a reciprocating slide or rod F⁴ by which the soldering iron is given its reciprocating movement, the hinged or pivotal connection F³ with the slide or rod F⁴ adapting the soldering iron also to receive the necessary slight up and down or vertical movement to enable the can bodies to be slipped along the soldering horn D under the soldering irons when they

are in their raised position. The soldering irons F or their carrier arms F² are preferably intermittently raised and lowered as required or given the necessary up and down movements by means of a reciprocating slide f¹ furnished with inclines or cams f² which engage rollers f³ on the hinged arm F² of the soldering iron. The arms F² are preferably connected to the heating chamber F¹ of the soldering iron F by connecting brackets F⁵. The slide or bar f¹ is preferably intermittently reciprocated as required by means of a cam m on a cam shaft M of the can body making machine through a connecting link m¹, bent lever or rock shaft m² and connecting link m³.

The reciprocating slide or rod F⁴ by which the soldering irons F are given their required horizontally reciprocating movement is preferably intermittently reciprocated as required by means of a cam m⁴ on the shaft M through a connecting link m⁵, rock shaft or bent lever m⁶ and connecting link m⁷.

The intermittently moving can body feeder or carrier E may be given its required reciprocating movement in any suitable manner as, for example, by a sprocket gear m⁸ on the shaft M through suitable connecting links and levers m⁹ m¹⁰ m¹¹ crank m¹², sprocket gear m¹³, and sprocket chain m¹⁴.

The solder feeder or roll H is given its required intermittent movement preferably from the can body feeder or carrier E through a connecting pawl or trigger h¹ which is adapted to engage a notch or projection e¹ on one of the reciprocating bars of the carrier E and which is pivotally connected by a pin h² to an arm h³ on a rock shaft h⁴ having an arm h⁵ which is pivotally connected at h⁶ with an arm h⁷ pivotally connected at h⁸ with a bent lever h⁹ carrying a pawl h¹⁰ which engages a ratchet h¹¹ on the shaft h¹² which is furnished with a bevel gear h¹³ meshing with a bevel gear h¹⁴ on the shaft h¹⁵ of the wire solder feed roll H. The bent lever h⁹ carrying the pawl h¹⁰ is also preferably furnished with another pawl h¹⁶ spaced a half tooth of the ratchet from the pawl h¹⁰ so that the lever h⁹ may be given a stroke of half a ratchet tooth and thus give the ratchet a half tooth turn. To regulate the stroke of the pawl lever h⁹ and the extent of feed of the solder wire, the link or arm h⁷ has an extension h¹⁷ furnished with an adjustable stop or screw h¹⁸. A spring h¹⁹ serves to retract the arm h³ of the rock shaft h⁴. The trigger or pawl h¹ is normally held out of engagement with the projection e¹ of the carrier E by a spring h²⁰ and it is moved into position on the back stroke of the carrier E to engage such projection e¹ on the carrier on the next forward stroke of the carrier E by the can body X on the soldering horn D in case a can body is there present under the first soldering iron

F to so move the trigger h¹ when the can body carrier E moves backward. As the trigger h¹ through which motion is communicated to the solder wire feeder is thus automatically moved into position for operation by the can body itself, it necessarily follows that unless a can body is in position on the soldering horn D under the first soldering iron F to receive the solder, the wire solder feeder will not be operated and no solder will be fed. By thus providing the solder feed actuating mechanism with a trigger operated by the can body itself, the solder is only fed to the can body when a can body is present to receive it.

I claim:—

1. In a lock seam can body making machine, the combination with the body former horn, body formers and bumper, of a soldering horn extending from the body former horn and having an open longitudinal slot at its upper part registering with the lock seam groove of the body former horn, of a can body feeder or carrier for moving the can bodies along the soldering horn by a step by step movement, and a plurality of up and down movable and horizontally reciprocating soldering irons or shoes engaging the can bodies while they are at rest on the soldering horn, and a wire solder feed roller or device for feeding a plurality of solder wires under the first soldering iron when it is in its raised position, substantially as specified.
2. In a can body making machine, the combination with a body former horn and a soldering horn extending therefrom around and along which the can bodies pass on at one end and off at the other, of an intermittently movable carrier for moving the can bodies along the soldering horn, and a longitudinally reciprocating soldering iron, substantially as specified.
3. The combination with a soldering horn around and along which the can bodies pass on at one end and off at the other having an open slot at its upper part, of means for moving the can bodies along the soldering horn by a step by step movement, and a longitudinally reciprocating soldering iron, substantially as specified.
4. The combination with a soldering horn around and along which the can bodies pass on at one end and off at the other, of means for moving the can bodies along the same by a step by step movement, of an up and down movable and horizontally longitudinally reciprocating soldering iron, substantially as specified.
5. In a can body machine, the combination with a soldering horn around and along which the can bodies pass on at one end and off at the other, of an up and down movable longitudinally reciprocating soldering iron and means for feeding the solder wire to the seam of the can under the soldering iron

while the soldering iron is in its raised position, substantially as specified.

6. In a can body machine, the combination with a soldering horn around and along which the can bodies pass on at one end and off at the other having an open slot at its upper part so that the soldering horn will not come in contact with the under side of the seam, and a longitudinally reciprocating soldering iron above the horn, substantially as specified.

7. In a can body machine, the combination with a soldering horn around and along which the can bodies pass on at one end and off at the other, of an intermittent feeder for the can bodies and a longitudinally reciprocating soldering horn engaging the can body while it is at rest upon the horn, substantially as specified.

8. In a can body machine, the combination with a soldering horn around and along which the can bodies pass on at one end and off at the other, of an intermittent feeder for the can bodies and a plurality of longitudinally reciprocating soldering irons, substantially as specified.

9. In a can body machine, the combination with a soldering horn around and along which the can bodies pass on at one end and off at the other, of an intermittent feeder for the can bodies and a plurality of longitudinally reciprocating soldering irons, and means for intermittently feeding a plurality of solder wires under one of the soldering irons, substantially as specified.

10. In a can body machine, the combination with a soldering horn around and along which the can bodies pass on at one end and off at the other having an open slot at its upper part, of a plurality of up and down movable and longitudinally reciprocating soldering irons, substantially as specified.

11. In a can body machine, the combination with a soldering horn around and along which the can bodies pass on at one end and off at the other having an open slot at its upper part, of a plurality of up and down movable and longitudinally reciprocating soldering irons, and means for feeding a plurality of solder wires, substantially as specified.

12. The combination with a soldering horn around and along which the can bodies pass on at one end and off at the other, of an up and down movable longitudinally reciprocating soldering iron and means for feeding a plurality of solder wires under the soldering iron, substantially as specified.

13. The combination with a soldering horn around and along which the can bodies pass on at one end and off at the other, of an up and down movable longitudinally reciprocating soldering iron, means for feeding a plurality of solder wires under the soldering iron, and means for reciprocating the solder-

ing iron in the direction of the horn, substantially as specified.

14. In a can body machine, the combination with a body former horn and a soldering horn extending therefrom around and along which the can bodies pass on at one end and off at the other, of a step by step carrier for moving the can bodies along the soldering horn, an up and down movable and longitudinally reciprocating soldering iron and a wire solder feed device, substantially as specified.

15. In a can body machine, the combination with a body former horn and a soldering horn extending therefrom, of a step by step carrier for moving the can bodies along the soldering horn, an up and down movable and reciprocating soldering iron and a wire solder feed device, and mechanism for operating the wire solder feed device furnished with a trigger or pawl operated by the can body on the soldering horn when one is present to receive the solder, substantially as specified.

16. In a can body machine, the combination with the soldering horn around and along which the can bodies pass on at one end and off at the other, of a reciprocating feeder for the can bodies and a longitudinally reciprocating soldering iron, a wire solder feed device, and mechanism for operating the wire solder feed device from the reciprocating can body feeder, substantially as specified.

17. In a can body machine, the combination with the soldering horn, of a reciprocating feeder for the can bodies, a reciprocating soldering iron, a wire solder feed device, mechanism for operating the wire solder feed device from the reciprocating can body feeder, said mechanism being furnished with a trigger actuated by the can body on the soldering horn when one is present thereon to receive the solder, substantially as specified.

18. In a can body making machine, the combination with a body former horn and a soldering horn extending therefrom around and along which the can bodies pass on at one end and off at the other, of an intermittently movable carrier for moving the can bodies along the soldering horn, and a longitudinally reciprocating soldering iron and a solder feed device, substantially as specified.

19. In a can body making machine, the combination with a body former horn and a soldering horn extending therefrom, of an intermittently movable carrier for moving the can bodies along the soldering iron, a reciprocating soldering iron, a solder feed device, and means for controlling the feed of the solder wire by the presence or absence of a can body on the soldering horn to receive the solder, substantially as specified.

20. The combination with a soldering horn around and along which the can bodies pass on at one end and off at the other, of means for moving the can bodies along the same by a step by step movement, of an up and down movable and longitudinally horizontally reciprocating soldering iron and means for feeding the solder wire under the soldering iron when in its raised position, substantially as specified.

21. The combination with a soldering horn, of means for moving the can bodies along the same by a step by step movement, of an up and down movable and horizontally reciprocating soldering iron, means for feeding the solder wire under the soldering iron when in its raised position, and means for controlling the feed of the solder wire by the presence or absence of a can body on the soldering horn to receive the solder, substantially as specified.

22. In a can body machine, the combination with a soldering horn around and along which the can bodies pass on at one end and off at the other having an open slot at its upper part so that the soldering horn will not come in contact with the under side of the seam, a longitudinally reciprocating soldering iron above the horn and means for reciprocating the soldering iron, substantially as specified.

23. In a can body machine, the combination with a soldering horn around and along which the can bodies pass on at one end and off at the other having an open slot at its upper part so that the soldering horn will not come in contact with the under side of the seam, a longitudinally reciprocating soldering iron above the horn, means for reciprocating the soldering iron, and means for raising the soldering iron, substantially as specified.

24. In a can body machine, the combination with a soldering horn around and along which the can bodies pass on at one end and off at the other having an open slot at its upper part so that the soldering horn will not come in contact with the under side of the seam, a longitudinally reciprocating soldering iron above the horn, means for reciprocating the soldering iron, means for raising the soldering iron, and means for feeding the solder wire under the soldering iron when in its raised position, substantially as specified.

25. In a can body machine, the combination with a soldering horn having an open slot at its upper part so that the soldering horn will not come in contact with the under sides of the seam, a soldering iron above the horn, means for reciprocating the soldering iron, means for raising the soldering iron, and means for feeding the solder wire under the soldering iron when in its raised position, and a device actuated by the can

body on the soldering horn for controlling the feed of the solder wire, substantially as specified.

26. The combination with a soldering horn around and along which the can bodies pass on at one end and off at the other, of a longitudinally reciprocating soldering iron above the horn, means for reciprocating the soldering iron, means for raising and lowering the soldering iron and an intermittent feeder for the can bodies, substantially as specified.

27. The combination with a soldering horn around and along which the can bodies pass on at one end and off at the other, of a longitudinally reciprocating soldering iron above the horn, means for reciprocating the longitudinally reciprocating soldering iron, means for raising and lowering the soldering iron and an intermittent feeder for the can bodies, and a solder wire feed device, substantially as specified.

28. The combination with a soldering horn, of a soldering iron above the horn, means for reciprocating the soldering iron, means for raising and lowering the soldering iron and an intermittent feeder for the can bodies, a solder wire feed device, and a device actuated by the can body on the soldering horn for controlling the feed of the solder wire, substantially as specified.

29. The combination with a soldering horn, of an up and down longitudinally reciprocating soldering iron and means for feeding a plurality of solder wires under the soldering iron, and an intermittently moving carrier for advancing the can bodies along the soldering horn, substantially as specified.

30. The combination with a soldering horn around and along which the can bodies pass on at one end and off at the other, of a fluxing device, and a soldering iron movable to and from the soldering horn and also longitudinally reciprocatory in the direction of the length of the soldering horn, and means for feeding solder wire under the soldering iron, substantially as specified.

31. The combination with a soldering horn around and along which the can bodies pass on at one end and off at the other, of a fluxing device, an up and down movable and longitudinally reciprocating soldering iron and means for feeding a plurality of solder wires under the soldering iron, substantially as specified.

32. The combination with a soldering horn, of a fluxing device, an up and down movable and reciprocating soldering iron, means for feeding a plurality of solder wires under the soldering iron, and a device operated by a can body on the soldering horn for controlling the feed of the solder wires, substantially as specified.

33. The combination with a soldering

horn adapted to have can bodies pass around and along the same on at one end and off at the other, of means for moving the can bodies along said horn, and a vertically movable and longitudinally reciprocating soldering iron arranged parallel to said soldering horn, substantially as specified.

34. The combination with a soldering horn, adapted to have can bodies pass around and along the same on at one end and off at the other, of a longitudinally reciprocating soldering iron arranged above and parallel to said horn and means for intermittently moving the can bodies along the horn each successively into position under the soldering iron, substantially as specified.

35. The combination with a soldering horn adapted to have can bodies pass around and along the same on at one end and off at the other, of a plurality of soldering irons

arranged above the horn and vertically movable to and from the horn, means for reciprocating said soldering irons longitudinally of the horn and means for moving the can bodies along the soldering horn, substantially as specified.

36. The combination with a soldering horn adapted to have can bodies pass around and along the same on at one end and off at the other, of a plurality of soldering irons arranged above the horn and vertically movable to and from the horn, means for reciprocating said soldering irons longitudinally of the horn and means for intermittently moving the can bodies along the soldering horn, substantially as specified.

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Witnesses:

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