

No. 620,247.

Patented Feb. 28, 1899.

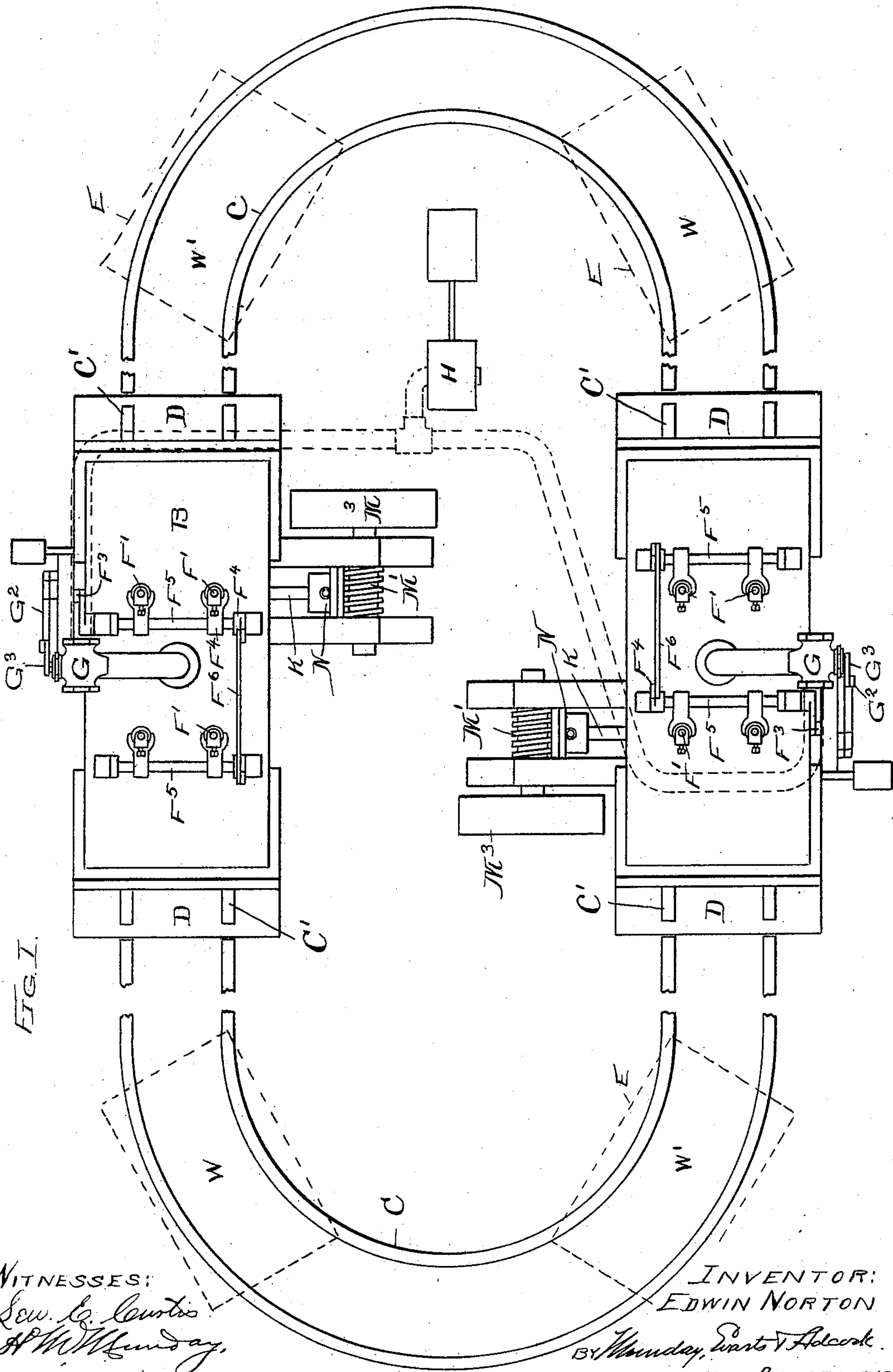
E. NORTON.

MACHINE FOR HERMETICALLY SEALING SHEET METAL CANS.

(Application filed Dec. 19, 1898.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES:
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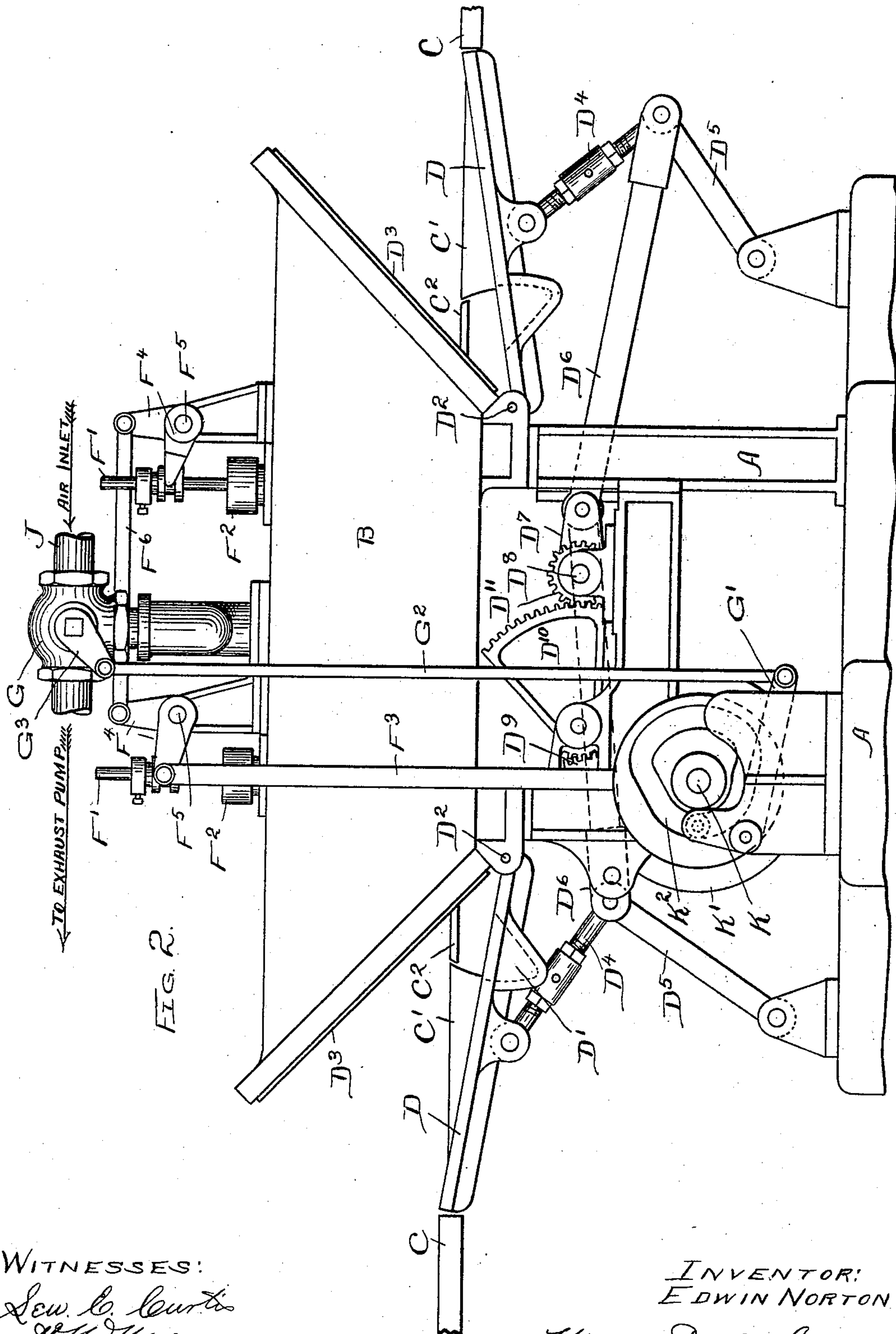
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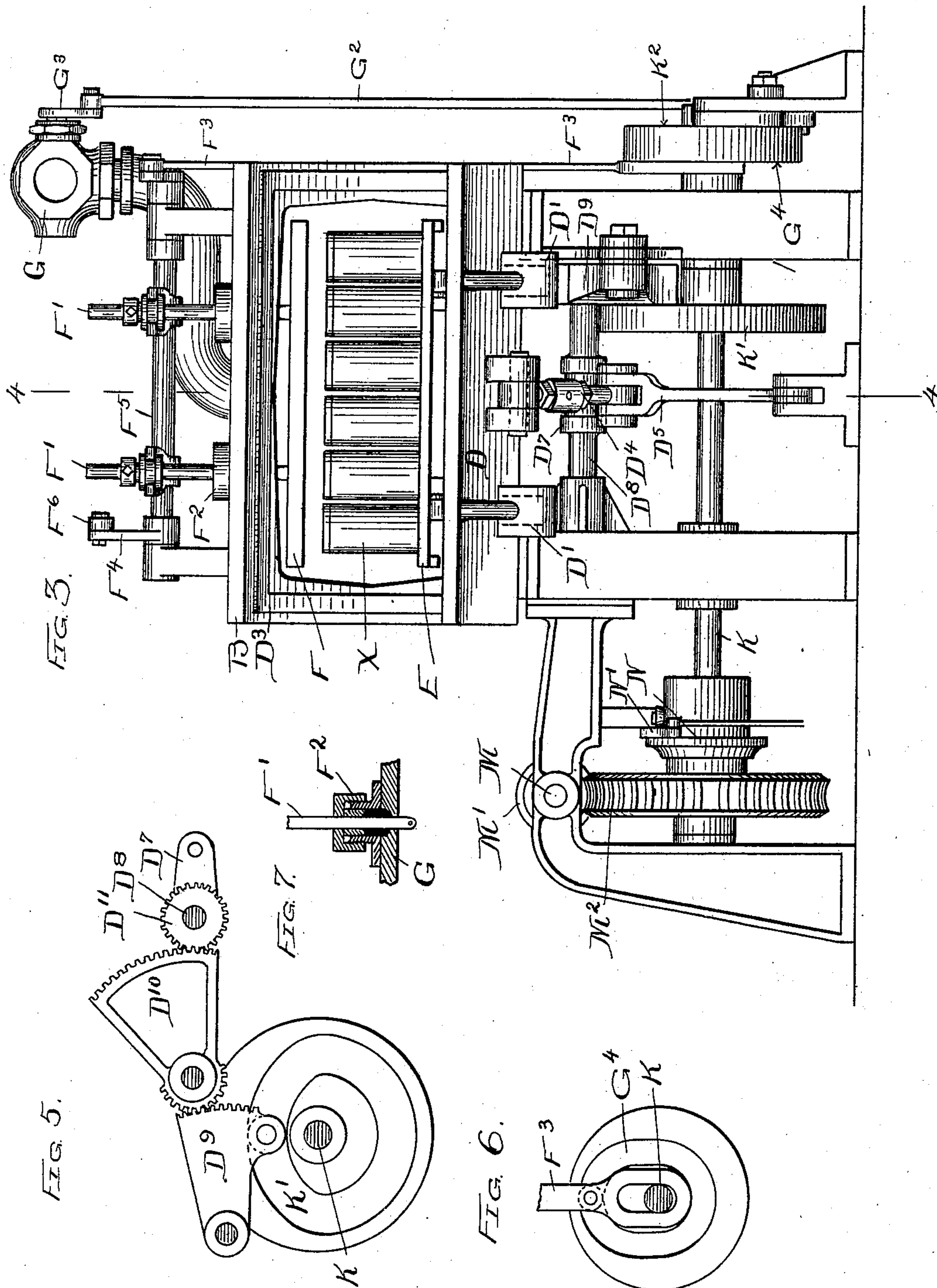
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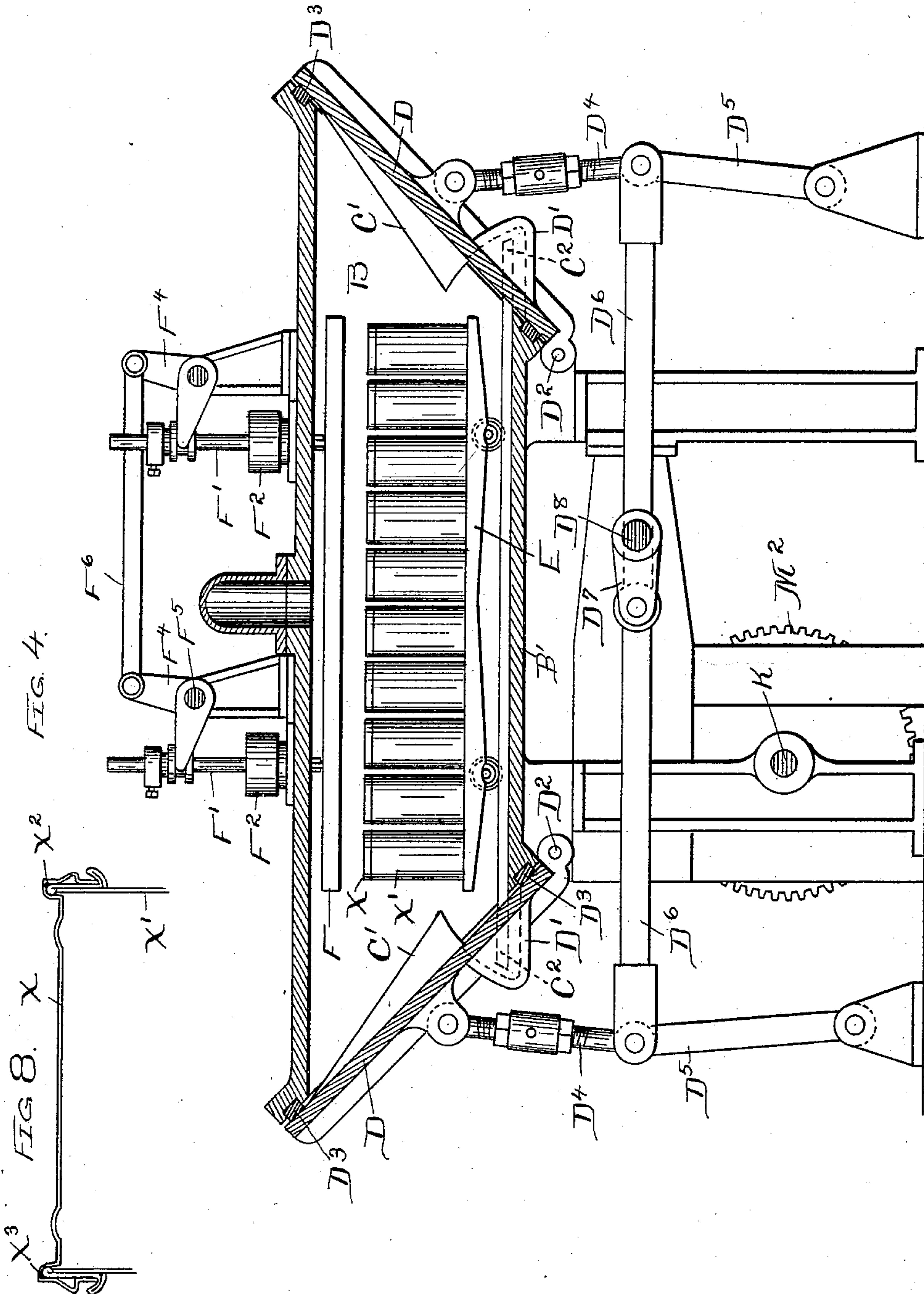
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(No Model.)

4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

EDWIN NORTON, OF MAYWOOD, ILLINOIS.

MACHINE FOR HERMETICALLY SEALING SHEET-METAL CANS.

SPECIFICATION forming part of Letters Patent No. 620,247, dated February 28, 1899.

Application filed December 19, 1898. Serial No. 699,736. (No model.)

To all whom it may concern:

Be it known that I, EDWIN NORTON, 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 Machines or Apparatus for Hermetically Sealing Sheet-Metal Cans or other Vessels, of which the following is a specification.

My invention relates to improvements in machines or apparatus for hermetically sealing or closing the covers upon sheet-metal cans or other vessels.

Heretofore in preserving food or other articles in hermetically-sealed cans or vessels it has generally been customary to seal or close the cover or cap upon the can by soldering the cover or cap in place on the can, which is a slow, expensive, and laborious operation, or by tightening and securing the cover or cap upon the can or vessel while heated to the boiling-point, a partial vacuum being produced by the subsequent cooling of the can or vessel, this method being also a slow and tedious operation requiring the individual handling of each can or vessel, and both these methods are open to serious objections well known to those skilled in the art.

The object of my invention is to provide an automatic machine or apparatus, by means of which the covers can be very rapidly and cheaply hermetically sealed and secured upon the cans or vessels, and by which also the air and other gases which may have injurious effects upon the contents of the cans or vessels may be removed therefrom before and at the instant the covers are sealed and secured thereto.

With this object in view my invention consists, in connection with a receiver from which the air may be exhausted by a vacuum-pump or other means, of automatically opening and closing doors for said receiver, an automatically-operated valve controlling the connection of the receiver with the vacuum-pump, an automatically-operated follower-plate for forcing the covers home upon the cans, and mechanism for first automatically closing the doors of the receiver; second, opening the valve between the receiver and the vacuum pump; third, operating the follower-plate to force the covers home upon the cans; fourth, to open the valve to admit air again to the

receiver while the follower-plate holds the covers securely sealed to the cans, and, fifth, again open the doors of the receiver and lift the follower-plate from the cans, the restored atmospheric pressure now holding and securing the covers firmly and tightly upon the cans.

My invention also consists in providing the doors of the receiver with tracks upon which the trucks containing the cans may be run, so that the cans may be easily and rapidly placed in and removed from the receiver.

It further consists in the combination, in a single apparatus, of two of said receivers with curved tracks for the can-trucks to run upon from one receiver to the other, so that the can-trucks may be run continuously through one receiver to the other and return to position for loading the cans upon the truck and removing them therefrom.

My invention further consists in the novel construction of parts and devices, and in the novel combinations of parts and devices, herein shown and described, and specified in the claims.

In the accompanying drawings, forming a part of this specification, and in which similar letters of reference indicate like parts throughout all the views, Figure 1 is a plan view of an apparatus or machine embodying my invention. Fig. 2 is a side elevation. Fig. 3 is an end elevation of one of the receivers, showing the doors open. Fig. 4 is a central longitudinal sectional view through one of the receivers. Figs. 5, 6, and 7 are detail views of parts hereinafter to be described, and Fig. 8 is a sectional view showing the construction of can or vessel which I prefer to use in practicing my invention.

In the drawings, A represents the frame of the machine.

B B are the receivers, and C is the curved track or rails extending from the door D of one of the receivers to the door D of the other at each end of the receivers and upon which tracks or rails C trucks E travel from and through one receiver to the other.

C' C' are extensions of the tracks or rails C on the doors D of the receiver, said extensions C' being inclined in respect to the doors D, so that when the doors D are opened to permit the can-trucks to be run in or out said

track extensions C' on the doors will be substantially horizontal, as indicated in Fig. 2 of the drawings. C² C² are similar track extensions on the bottom B' of the receiver, the doors D being provided with pockets D' to receive the ends of the track or rail extensions C². These pockets enable the rails C² to be extended to meet the ends of the inclined rails C' on the doors D without interfering with the proper closing of the doors, as will be readily understood from Figs. 2 and 4 of the drawings. The doors D are hinged at D² to the receiver and occupy an inclined position when closed, preferably about as illustrated in the drawings.

D³ is a rubber or other packing secured in suitable grooves in the end faces of the receiver, against which packing the door is closed to form a tight joint.

F is the follower-plate, by which the covers X are pressed home upon the cans X' on the can-truck E. This follower-plate is automatically operated through its piston stems or rods F', which extend through suitable stuffing-boxes F², with which the top of the receiver is provided for this purpose.

G is the valve, preferably a three-way valve, for opening and closing the communication between the receiver B and the vacuum or air pump H and the air-inlet J at intervals, as required.

The inclined doors D D of the receiver are automatically opened and closed at suitable intervals, as required, by means of the toggle-links D⁴ D⁵ and connecting-links D⁶, extending from the toggle-links to the crank-arm D⁷ on the crank-shaft D⁸, which is automatically oscillated, as required, by the cam K' on the cam-shaft K, through the segment-gears D⁹ D¹⁰, the latter of which meshes with a gear D¹¹ on said crank-shaft D⁸.

The three-way valve G is automatically turned or operated as required to first open the communication with the vacuum-pump and then close said communication and open the communication with the air-inlet by means of a cam K² on the cam-shaft K through the lever G' and link G², connecting with the operating-arm G³ of the valve.

The follower-plate F is automatically operated at suitable intervals as required to force the covers home upon the cans after the air has been exhausted therefrom and from the receiver B by the operation of the vacuum-pump, and before the atmospheric pressure is again restored to the receiver by means of a cam G⁴ on the cam-shaft K through the slotted connecting-link F³, the several piston stems or rods F' being connected together and to the operating-bar F³ by means of the bent levers F⁴ F⁴ on the crank-shafts F⁵ and the connecting-link F⁶.

Power is communicated to the cam-shaft K from the driving-shaft M through the worm M' and worm-gear M². M³ is the driving-pulley on the driving-shaft.

N is a clutch, and N' the clutch-lever or

treadle by which the cam-shaft K is connected to the worm-gear M² at intervals by the operator when a truck-load of cans is run into the receiver and ready to be operated upon.

While I have illustrated in the drawings the mechanism which I prefer to use for automatically operating in proper succession and at the required intervals the doors of the receiver, the valve, and the follower-plate, it will be understood by those skilled in the art that such operating or motion-giving mechanism may be varied or changed without departing from the principle of my invention.

The vacuum or air pump H may be of any suitable construction.

The wheeled trucks E may be made of any suitable size. As illustrated in the drawings, each can-truck is designed to hold sixty cans, the covers being thus automatically sealed upon and secured to the sixty cans upon the truck at a single time or operation. From about one-half to one minute's time is ordinarily required for going through one complete operation, consisting in closing the doors of the receiver, pumping the air out of the cans and from the receiver operating the follower-plate to force the covers home upon the cans, and admitting air again to the receiver, opening the doors, and running the can-truck in and out of the receiver. The complete apparatus comprising the two receivers will thus hermetically seal and secure the covers upon one hundred and twenty cans per minute. In practice each machine or apparatus is provided with six can-trucks, two of which are being loaded with cans, two unloaded, and two of which are being operated upon in the two receivers.

The loading-stations are indicated on Fig. 1 of the drawings at W W and the unloading-stations at W' W'.

The can or vessel X' may be of any suitable construction provided with a shoulder or roll at its upper edge for the gasket or packing-ring X² on the cover to bear against. The cover X is provided with an annular channel X³ to receive the packing ring or gasket X².

I claim—

1. The apparatus for automatically sealing and securing the covers upon cans or vessels by a vacuum or atmospheric pressure seal comprising in combination a receiver, doors for said receiver through which the cans may be inserted and removed, a follower plate or platen for forcing the covers home upon the cans, a valve for opening and closing the exhaust and air-inlet communications, and mechanism for automatically operating said doors, valve and follower-plate, substantially as specified.

2. The combination with a receiver of a follower-plate for forcing the covers home upon the cans, and mechanism for automatically operating said follower-plate before the air-inlet valve is opened to restore the atmospheric pressure to the receiver, substantially as specified.

3. The combination with a receiver, provided with a door through which the cans may be inserted and removed, a valve for opening and closing the communication between the exhaust and air-inlet valve and receiver, a follower-plate for forcing the covers home upon the cans or vessels, and mechanism for automatically operating said door, valve and follower-plate, substantially as specified.

4. The combination with a receiver having a door, of a valve controlling the communication between the receiver and the exhaust and air-inlet, a follower-plate for forcing the covers home upon the vessels, and mechanism for automatically operating said valve and follower-plate, substantially as specified.

5. In an apparatus for automatically sealing and securing the covers on cans or vessels by a vacuum or atmospheric pressure seal, the combination with a receiver, having doors, of tracks or rails on the bottom and on the doors of the receiver for a can-truck, substantially as specified.

6. In an apparatus for automatically sealing and securing the covers on cans or vessels by a vacuum or atmospheric pressure seal, the combination with a receiver, having doors, of tracks or rails on the bottom and on the doors of the receiver for a can-truck, said doors being inclined when closed, and provided with pockets to receive the ends of the rails on the bottom of the receiver, substantially as specified.

7. In an apparatus for automatically sealing and securing the covers on cans or vessels by a vacuum or atmospheric pressure seal, the combination with a receiver, having doors, of tracks or rails on the bottom and on the doors of the receiver for a can-truck, said doors being inclined when closed, and provided with pockets to receive the ends of the rails on the bottom of the receiver, and the tracks or rails on the doors being inclined in respect to the doors, substantially as specified.

8. The combination with two receivers having doors at each end thereof, of a curved track or rails uniting the receivers, substantially as specified.

9. The combination with two receivers having inclined doors furnished with tracks or

rails, and curved tracks or rails uniting the receivers, substantially as specified.

10. The combination with two receivers having inclined doors furnished with tracks or rails, and curved tracks or rails uniting the receivers, the bottoms of said receivers being furnished with tracks or rails, substantially as specified.

11. In an apparatus for automatically sealing and securing covers on cans or vessels by a vacuum or atmospheric pressure seal, a receiver having automatically opening and closing doors, substantially as specified.

12. In an apparatus for automatically sealing and securing covers on cans or vessels by a vacuum or atmospheric pressure seal, a receiver having automatically opening and closing inclined doors, substantially as specified.

13. In an apparatus for automatically sealing and securing covers on cans or vessels by a vacuum or atmospheric pressure seal, a receiver having automatically opening and closing inclined doors, and tracks or rails for a can-truck on the doors and on the bottom of the receiver, substantially as specified.

14. In an apparatus for automatically sealing and securing covers on cans or vessels by a vacuum or atmospheric pressure seal, a receiver having automatically opening and closing inclined doors, and tracks or rails for a can-truck on the doors and on the bottom of the receiver, said doors having pockets to receive the ends of the tracks or rails on the bottom of the receiver, substantially as specified.

15. The combination with a receiver having doors, of toggle-links for opening and closing the doors of the receiver, a crank-shaft and arm, and links connecting the crank-arm with said toggle-links, substantially as specified.

16. The combination with a receiver having doors, of toggle-links for opening and closing the doors of the receiver, a crank-shaft and arm, links connecting the crank-arm with said toggle-links, and a cam for operating the same, substantially as specified.

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Witnesses:

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