

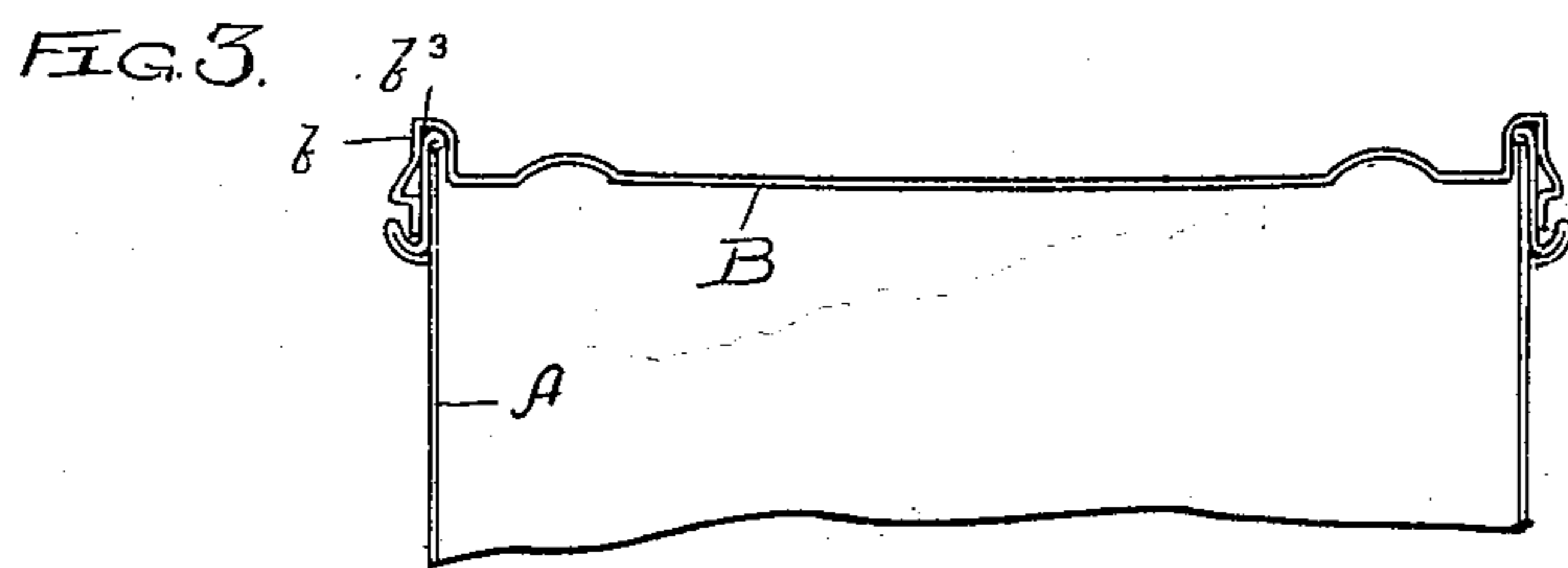
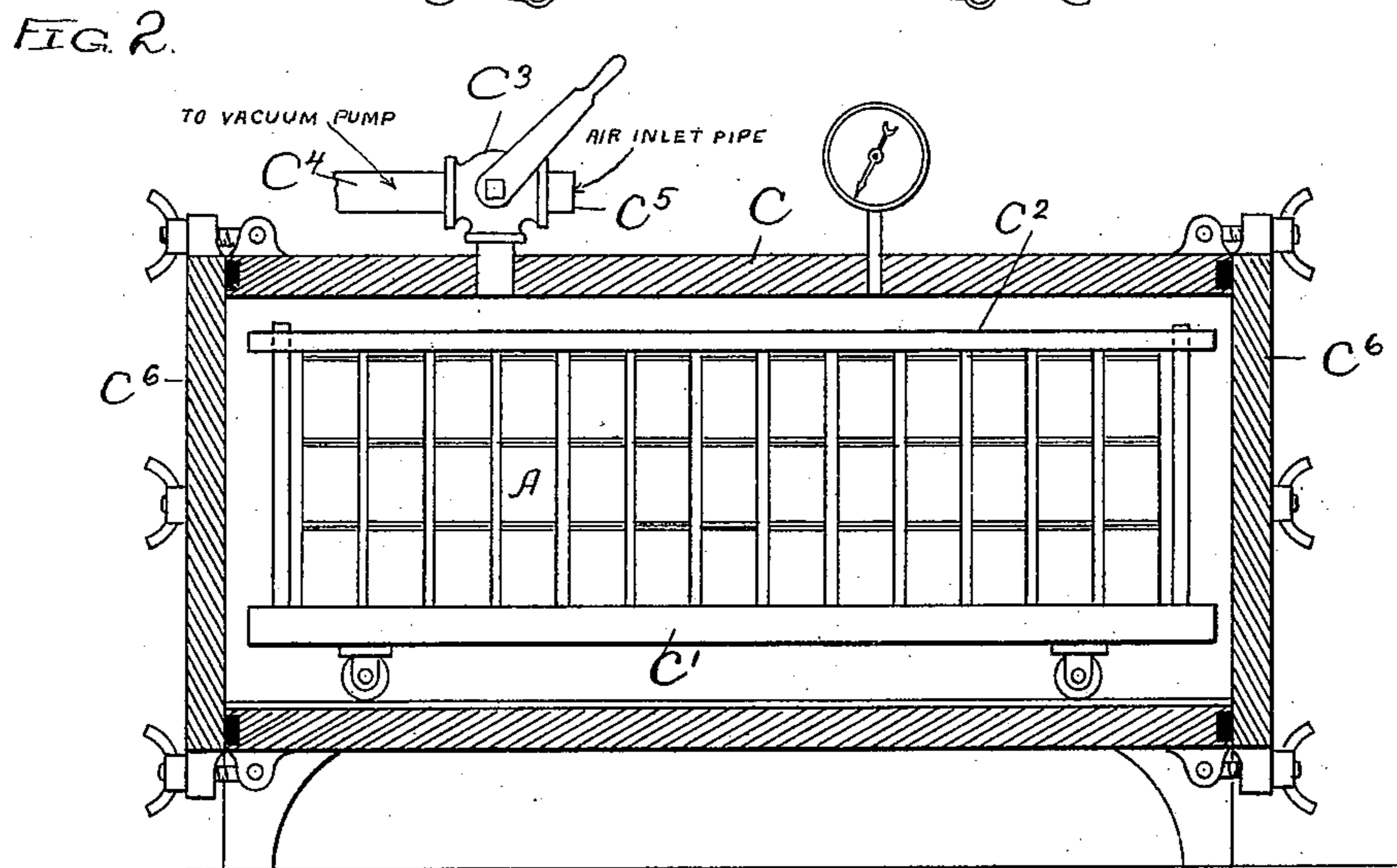
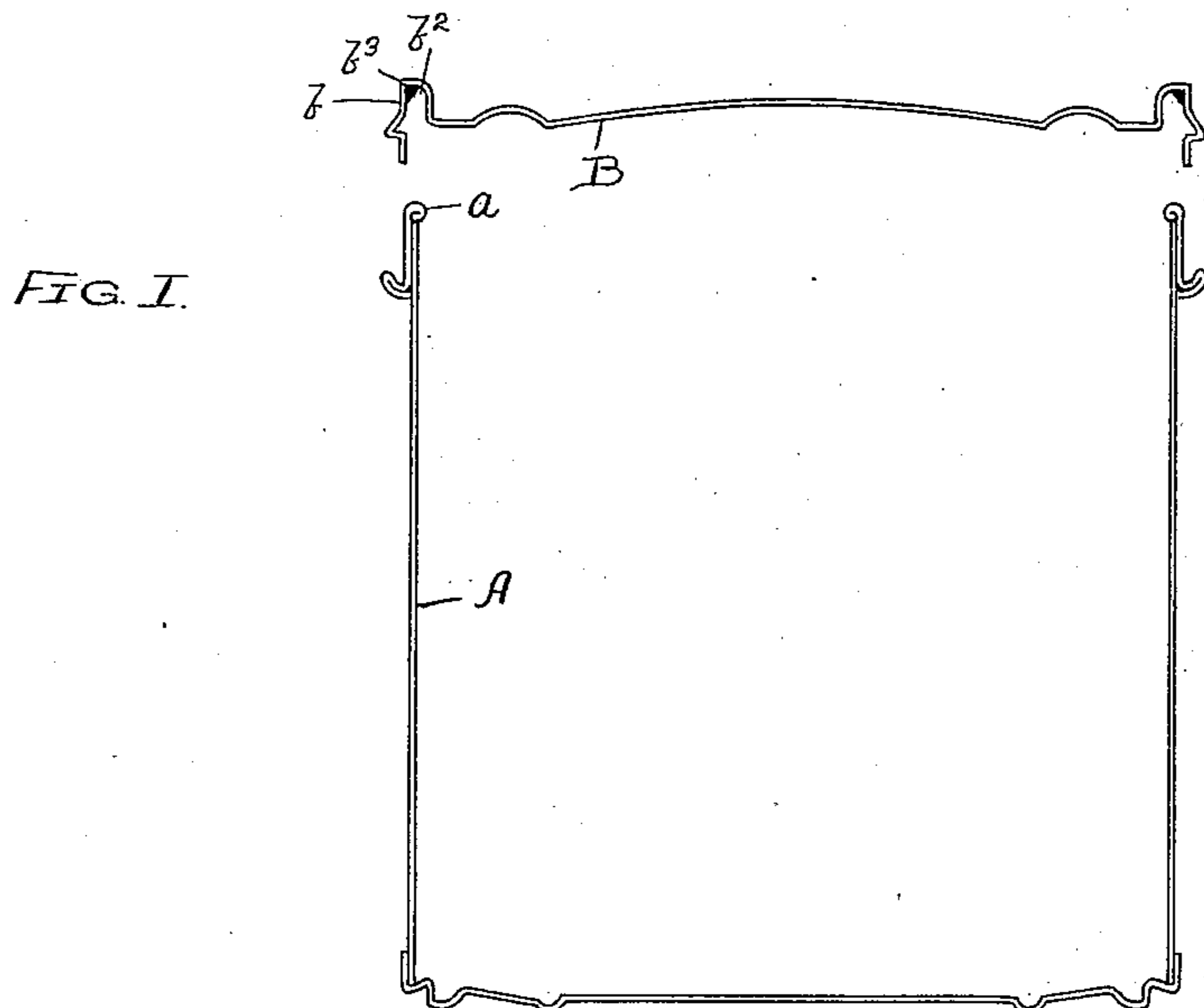
(No Model.)

2 Sheets—Sheet 1.

E. NORTON.
PROCESS OF CANNING FOOD.

No. 602,096.

Patented Apr. 12, 1898.



WITNESSES:

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H. W. Munday

INVENTOR:
EDWIN NORTON

BY *Munday, Davis & Adcock.*

HIS ATTORNEYS.

(No Model.)

2 Sheets—Sheet 2.

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FIG. 4.

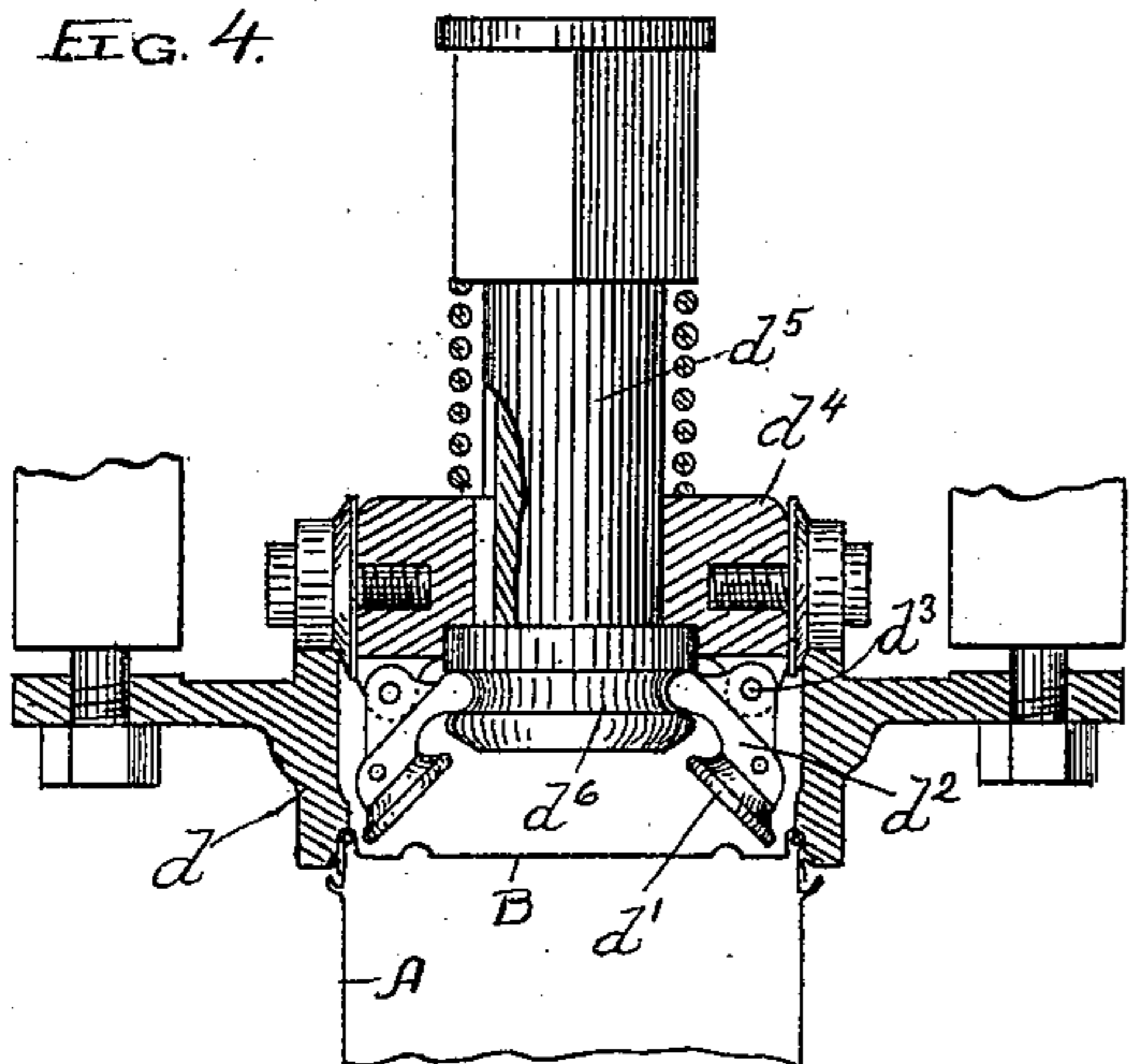


FIG. 6.

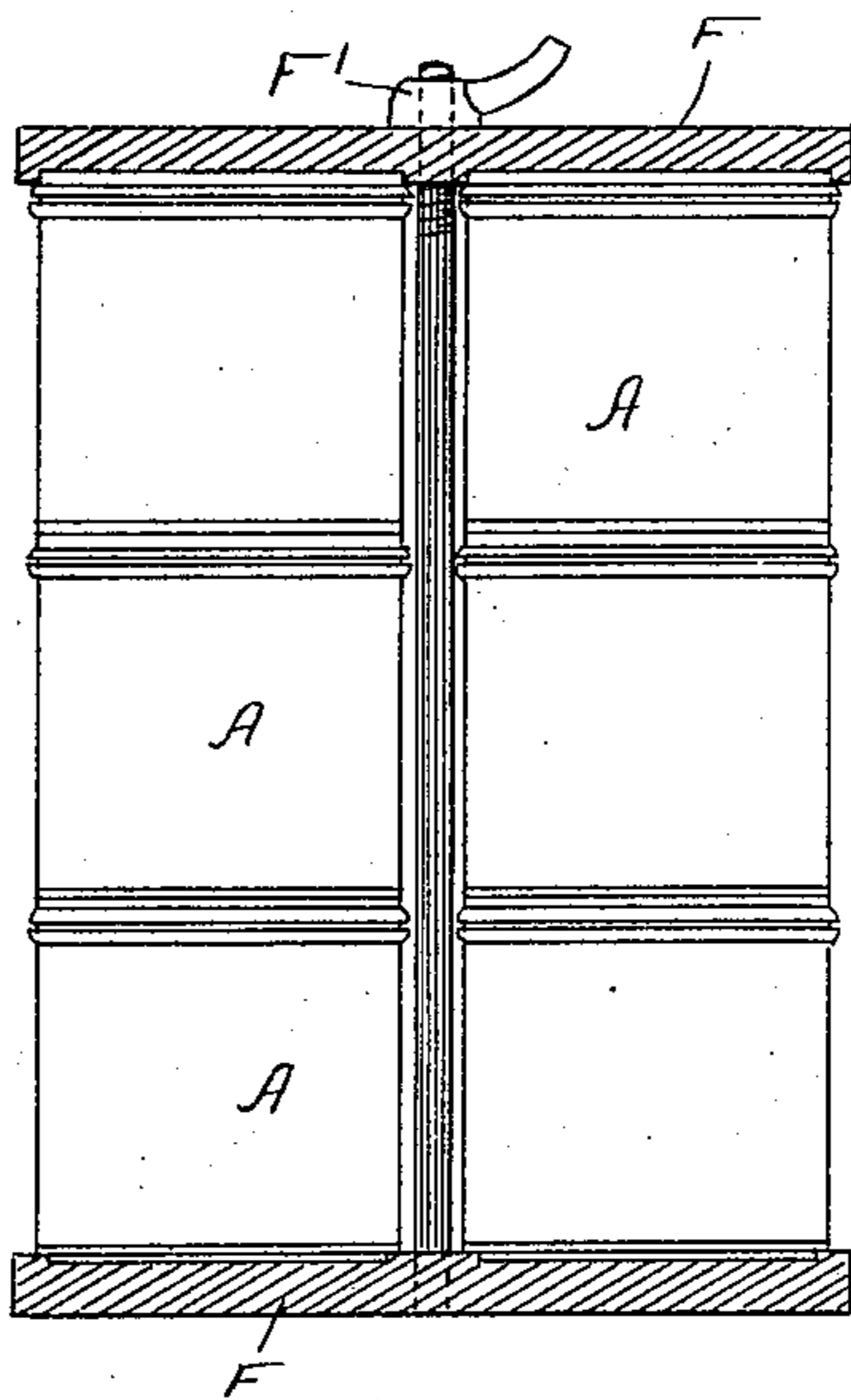


FIG. 5.

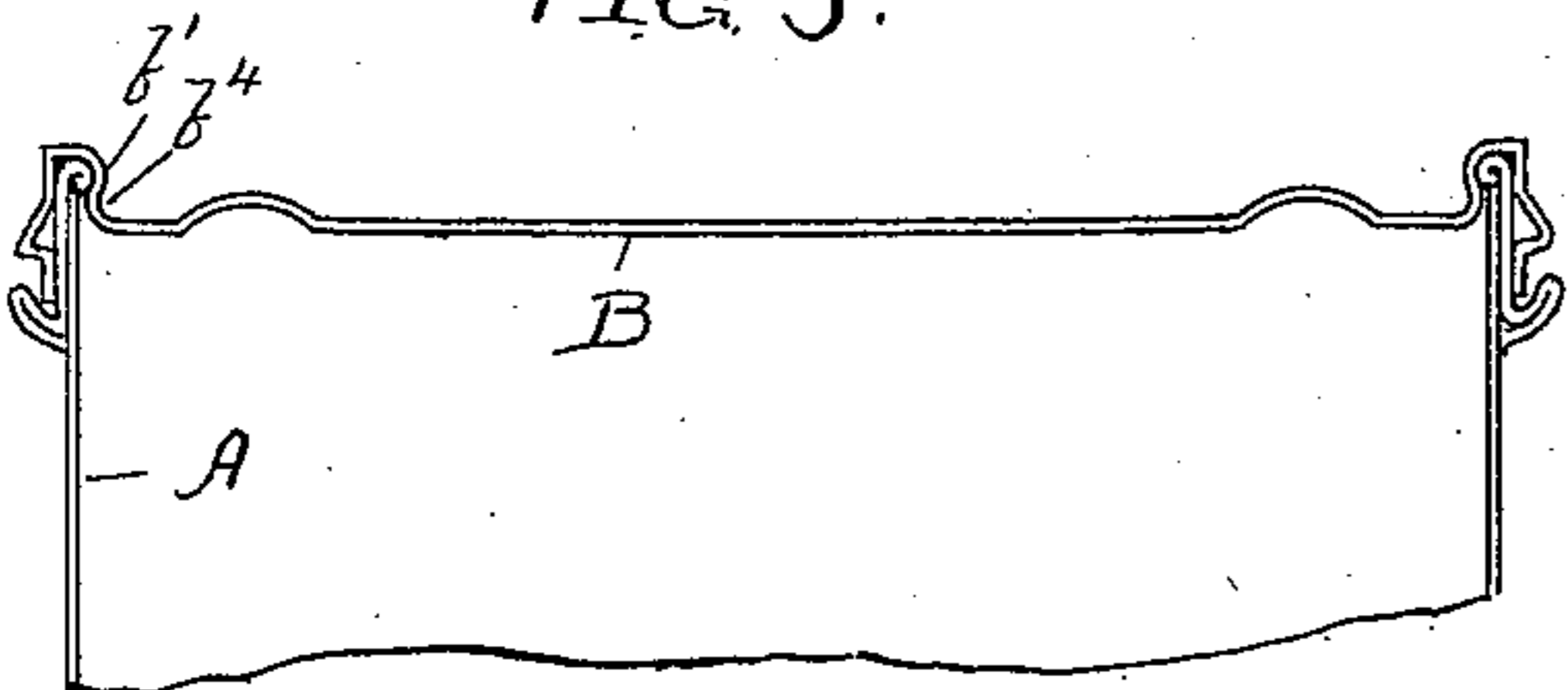
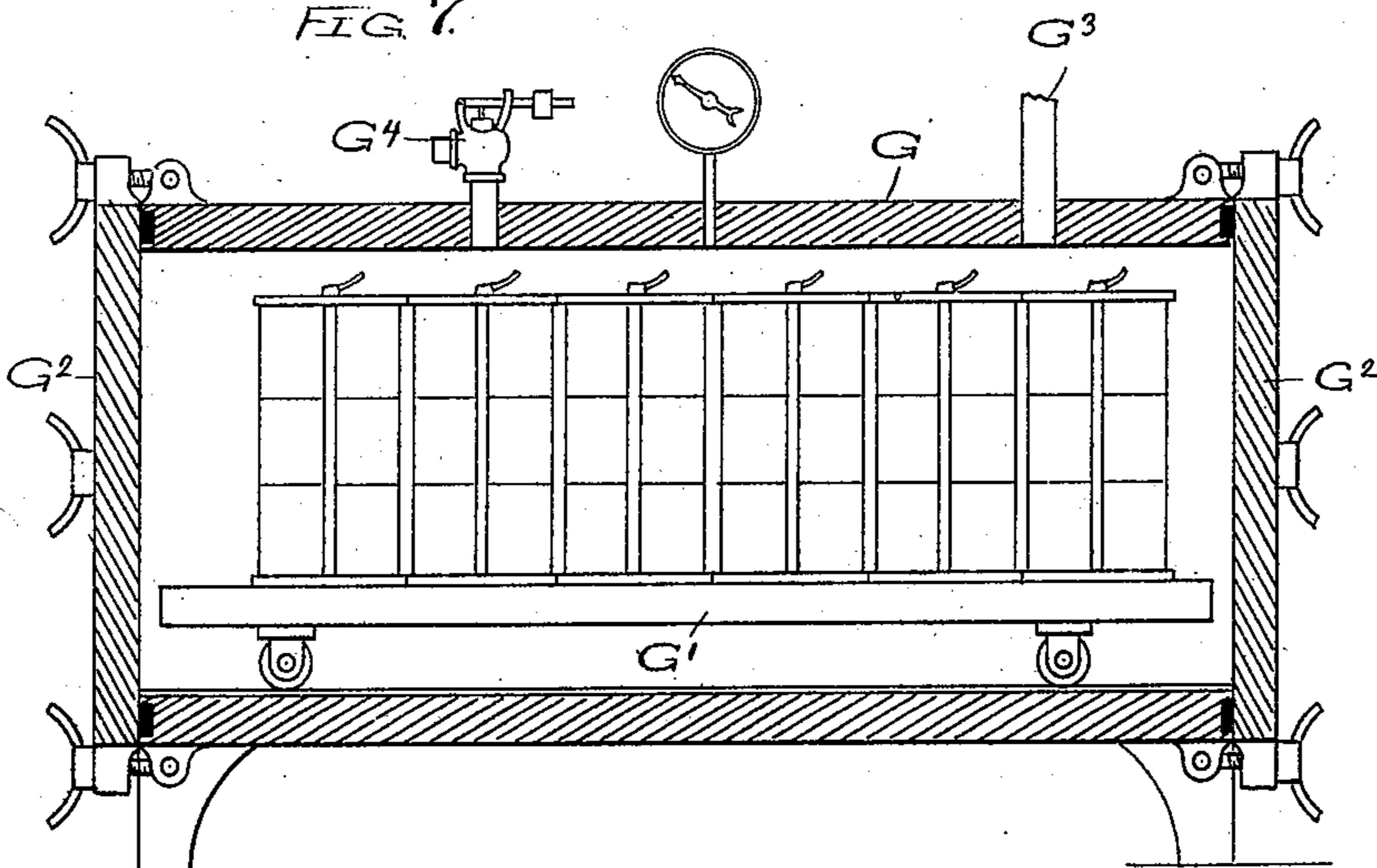


FIG. 7.



WITNESSES:

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UNITED STATES PATENT OFFICE.

EDWIN NORTON, OF MAYWOOD, ILLINOIS, ASSIGNOR TO THE NORTON
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PROCESS OF CANNING FOOD.

SPECIFICATION forming part of Letters Patent No. 602,096, dated April 12, 1898.

Application filed October 7, 1897. Serial No. 654,333. (No specimens.)

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 Processes of Canning Hermetically-Sealed Food, of which the following is a specification.

The purpose of my invention is to improve the flavor of the canned food, to remove therefrom the flat taste imparted to the food by the method of canning now commonly employed, and to preserve in cans articles of food that cannot be canned successfully by present methods; also, to prevent the formation in the can of deposits of sulfite of tin, which deposits are now of common occurrence in vegetables which contain sulfur and are caused by the air sealed up in the cans uniting with the sulfur in the vegetables and the tin coating of the metal and forming sulfite of tin, which deposits on the goods and also on the inside of the can-top above the air-space left in the cans in filling frequently to such an extent as to make the goods unsightly, and particularly as the appearance of this "sulfite" is so nearly like that of iron rust that only a chemical analysis will show the difference. I overcome this difficulty, that has always been present to a greater or less extent—and herein my invention consists—by first withdrawing the air from the cans after they have been filled to about ninety per cent. of the amount in them, then sealing the cans and cooking the contents in vacuum. I have discovered by repeated tests that when a vacuum—say of twenty-seven feet—is maintained in the cans during the time the food is being cooked the flavor of the goods is maintained thereby, and also that the removal of this air from the can before the contents are subjected to the heat of the water or steam bath in the cooking vessels or retorts prevents the formation of sulfid-of-tin deposits on the can and contents; and another advantage of my improved process over the old is that when the air is withdrawn from the can and contents before the cooking is done there is less expansion and strain upon the cans and their soldered seams than heretofore, thereby saving a large amount of loss

from bursting of cans in the cooking-retorts from undue pressure on the metal of the cans.

The apparatus I employ for practicing my improved process is not part of the invention herein claimed, but is the subject of separate applications, Serial Nos. 603,993 and 654,334, heretofore filed, and Patents Nos. 436,466, 546,468, and 546,469 already granted. I have, however, in the accompanying drawings, which form a part of this specification, to enable my invention to be more fully and clearly understood by those skilled in the art, illustrated suitable apparatus for use in practicing my invention, and the same being of the construction which I prefer to employ.

In the drawings, Figure 1 is a sectional view showing a suitable construction of can for use in practicing my invention. Fig. 2 is a sectional view of a suitable construction of air-pump, receiver, or vacuum-chamber for use in mechanically exhausting the air from the cans and hermetically sealing and securing the covers to the cans by a vacuum or atmospheric-pressure seal. Fig. 3 is a sectional view of the can, showing it thus sealed. Fig. 4 is a sectional view of an expansion sealing-machine suitable for use in sealing and securing the covers to the cans by the mechanical seal or seam. Fig. 5 is a sectional view of the can with its cover thus sealed to the can both by the vacuum or atmospheric-pressure seal and the mechanical seal. Fig. 6 is a sectional view of a clamping device suitable for use in clamping the covers on the cans to prevent any danger of the steam-pressure, created by the cooking operation in the can, breaking or injuring the hermetic seal, uniting the cover to the can, and reinforcing the can while being subjected to the cooking step or operation; and Fig. 7 is a sectional view of a cooking-retort suitable for use in cooking and sterilizing the contents of the can.

In the drawings similar letters of reference are employed to indicate like parts in all the figures.

The cans used in practicing my invention must be so constructed that when they are filled and the covers put on and they are placed in the receiver of a vacuum-pump or in contact with any mechanical appliance that

will produce a vacuum in them and the covers can be sealed to prevent the return of the air into the cans. Any suitable construction of can that will admit of this will answer.

5 Such a construction is shown in the drawings at Fig. 1, the same being the construction I prefer to use. After the cans have been sealed by a vacuum joint or seal and before they are ready to be cooked they should have

10 their covers securely fastened on, so that when placed in the cooking-retorts and subjected to steam heat sufficient to sterilize and cook the contents the mechanical seal will assist in holding the cans sealed air-tight during the cooking operation and until the atmospheric pressure is again restored or not counterbalanced by the steam-pressure in the can by cooling off the cans and their contents. This can be done in any suitable way.

20 I have shown in the drawings a very good and convenient mechanism, which consists in passing the cans through what is called an "expansion-capper" or "seaming-machine," (shown in Fig. 4,) which expands the countersunk head of the can below a roll on the upper end of the can-body and locks the cover securely to the can. This closure also prevents the tops coming off in case at any time the vacuum-seal is broken by the goods

30 in the can spoiling from improper cooking or other causes. After the mechanical capping or sealing operation I next place the cans in clamps, a number of rows of cans, for convenience, being firmly clamped by means of an upper and lower plate connected by a threaded shaft and provided with a nut for screwing down the upper plate to clamp the cans. This clamp is illustrated in Fig. 6 of the drawings. Any device that will prevent

40 the seal being broken while the cooking is being done will answer as well. The cans, having been filled with food, a vacuum produced by mechanical means, and the covers sealed on to maintain the vacuum during the cooking process, are now placed in an ordinary cooking-retort (illustrated in Fig. 7 of the drawings) and cooked as usual, except that in my process I have only about ten per cent. of the air remaining in the cans to be

50 sterilized with the food, and this small quantity does not injure the flavor of the food, and the smallness of the quantity of air remaining in the can prevents the forming of sulfite of tin in case tin cans are used. The process can be used in vessels other than tin, such as glass. After the cooking the cans are immersed in cold water or cooled off in any suitable manner before being removed from the clamps.

60 Referring now to the drawings, A represents the body of the can, and B the cover. The can-body has at its upper or mouth end an inwardly-projecting roll or shoulder a . The cover B has an outer flange b and an inner flange b' , forming between them an annular channel or seat b^2 for a packing b^3 , so that when the filled can A is placed within

the receiver of a vacuum-pump, with the cover B loosely in place on the can, the air may be readily pumped out of the can through its 70 open mouth a , so that when the pressure is suddenly restored to the receiver the cover will be instantaneously and hermetically sealed and secured thereto by a vacuum or atmospheric-pressure seal. 75

C, Fig. 2, is the receiver of a vacuum-pump in which the cans A are placed, preferably on a suitable truck C' , piled in tiers and with a follower-plate C^2 on top of the pile to better insure the moving of the covers straight and 80 squarely home on the cans when the pressure is suddenly restored.

C^3 is a three-way valve for opening and closing the communication between the receiver C and the pipe C^4 , leading to the vacuum-pump, or the air-inlet pipe C^5 . The receiver C is preferably furnished with doors C^6 at each end, so that the trucks of cans can be rolled in at one end and out at the other. 85

In Fig. 3 one of the cans is illustrated after 90 being operated upon by the receiver C, the cover B being forced home on the can and hermetically sealed and secured thereto by the atmospheric-pressure or vacuum seal.

The expansion seaming-machine, which I 95 prefer to employ for forming the mechanical seal uniting the cover to the can, does this work by making an outward bend or crimp b^4 in the inner flange b' of the cover, and thus locking it out under and against the inwardly-projecting roll a on the can-body, and, as illustrated in Fig. 4, it preferably comprises the clamping-ring d , surrounding and embracing the upper end of the can-body, and the seaming-rollers d' , journaled on levers d^2 , 100 hinged by pivots d^3 to a rotating ring or sleeve d^4 , splined to the shaft d^5 , which is provided with a grooved head d^6 , that engages the inner ends of said levers.

In Fig. 5 the can A is illustrated in this 110 next step of the process—that is to say, after the cover has been mechanically sealed and secured thereto by the sealing-machine illustrated in Fig. 4. The cans, as illustrated in Fig. 5, are next placed between a pair of 115 clamps F F, which are connected and adapted to be forced together by the clamp-screws F' . The cans are preferably placed between the clamps in tiers or columns, as illustrated in Fig. 6. After being thus clamped the cans 120 are next placed in the cooking-retort G, this being preferably done by placing the cans on a suitable truck G' and running the truck into the retort through the door G^2 thereof.

G^3 represents the steam-inlet pipe, and G^4 125 the safety-valve.

I claim—

1. The herein-described process of canning hermetically-sealed food, consisting in placing the food in cans provided with covers 130 adapted to be sealed by atmospheric pressure, placing the cans with their covers in place within a receiver, exhausting the air in the cans, and sealing the covers on the cans

by the sudden admission of air to the receiver, substantially as described.

2. The herein-described process of canning hermetically-sealed food, consisting in placing the food in cans provided with covers adapted to be sealed by atmospheric pressure, placing the cans with their covers in place within a receiver, exhausting the air in the cans, sealing the covers on by the sudden admission of air to the receiver, then locking the covers securely to the cans so as to form an air-tight mechanical seal, and finally cooking the contents while in vacuum, substantially as described.

3. The herein-described process of canning hermetically-sealed food, which consists in placing the food in cans with covers for the entire top, placing such filled cans with their covers in place within a receiver, exhausting the air from the receiver, cans, and contents, and seaming the covers on the cans so as to form an air-tight mechanical seal, substantially as described.

4. The herein-described process of canning hermetically-sealed food, which consists in placing the food in cans with covers for the entire top, placing such filled cans with their covers in place within a receiver, exhausting the air from the receiver, cans, and contents, and seaming the covers on the cans so as to form an air-tight mechanical seal, then clamping the filled cans and processing the same to sterilize the contents, substantially as described.

5. The process of canning food or other articles, consisting in the following steps: first, filling the cans, next extracting the air therefrom, next sealing the covers on the cans with a vacuum-seal, next locking the covers securely to the cans by seaming to prevent the escape of their contents or of steam or gases arising therefrom during the next or cooking step, and finally cooking the contents while

in vacuum, substantially as shown and described.

6. The process of canning hermetically-sealed food, consisting in the following steps: first filling the cans, next producing by mechanical means as near a perfect vacuum in the cans as practicable by removal of the air therefrom, next sealing the covers on the cans by seaming to prevent the return of air thereto and to prevent the escape of their contents or of steam or gases arising therefrom during the next or cooking step, and next cooking the food contained in the cans while in a vacuum, whereby the injurious effects upon the cans and contents of the air always heretofore sealed up in the cans with the food, is avoided, substantially as shown and described.

7. The herein-described process of canning hermetically-sealed food, consisting in placing the food in cans provided with covers adapted to be sealed by atmospheric pressure, placing the cans with their covers in place within the receiver, exhausting the air in the cans, and sealing the covers on by the sudden admission of air to the receiver, next removing the cans from the receiver and securely sealing the covers to the cans by a mechanical seal to prevent the escape of their contents or of steam or gases arising therefrom, next placing the cans in suitable clamps to prevent the action of the steam cooking from breaking the sealed joint between the cans and covers, placing the cans in a cooking-retort and sterilizing and cooking the contents while in vacuum, next removing the cans from the retort and cooling the contents, and next removing them from the clamps, substantially as shown and described.

EDWIN NORTON.

Witnesses:

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EDMUND ADCOCK.