

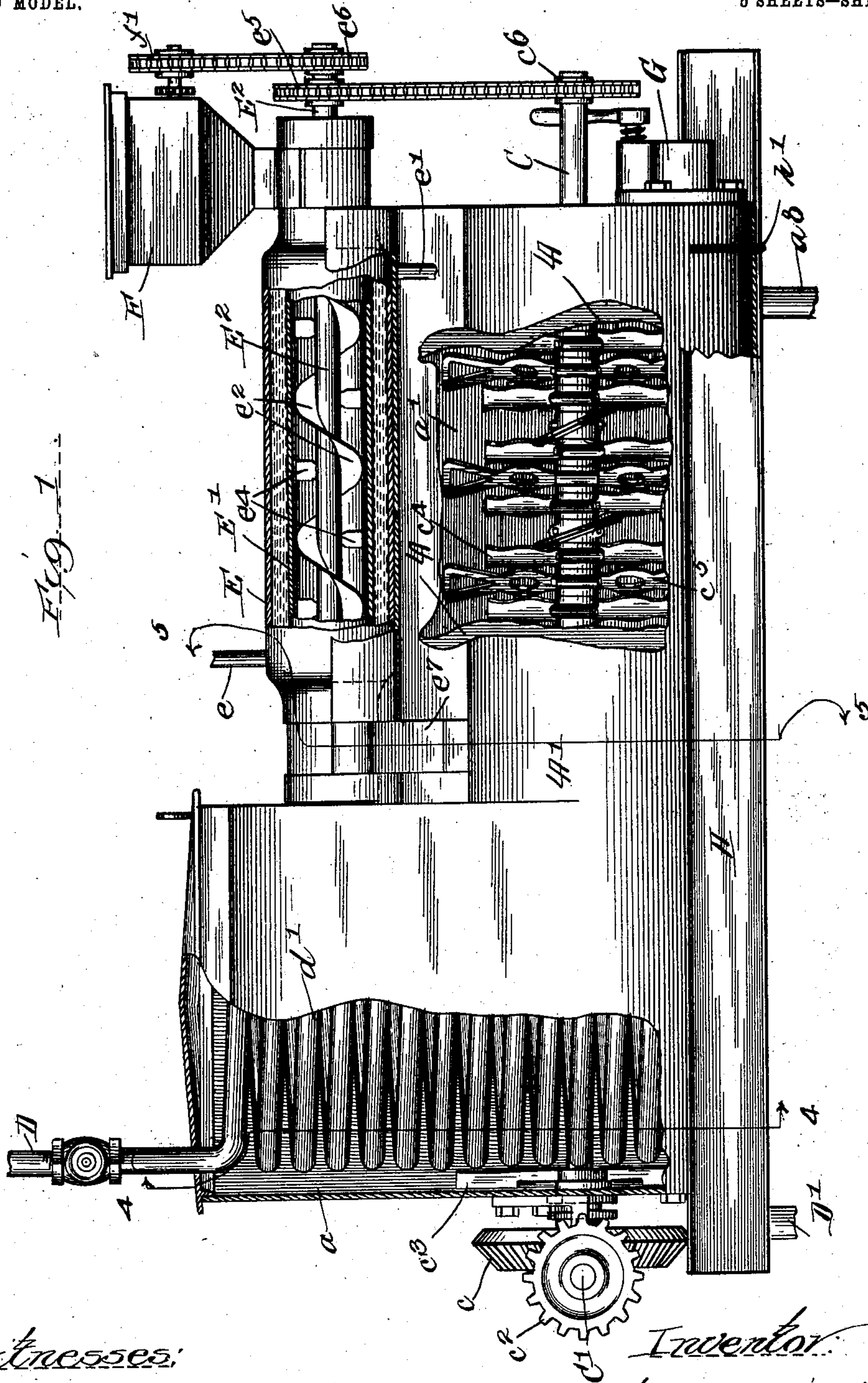
No. 747,653.

PATENTED DEC. 22, 1903.

G. A. SCHILLINGER.
MIXER FOR PLASTIC MATERIAL.
APPLICATION FILED DEC. 6, 1901.

NO MODEL.

5 SHEETS—SHEET 1.



Witnesses:

Harry B. White.
Ray White.

Inventor:
Gustav A. Schillinger
By Charles W. Rice,
Attorney.

No. 747,653.

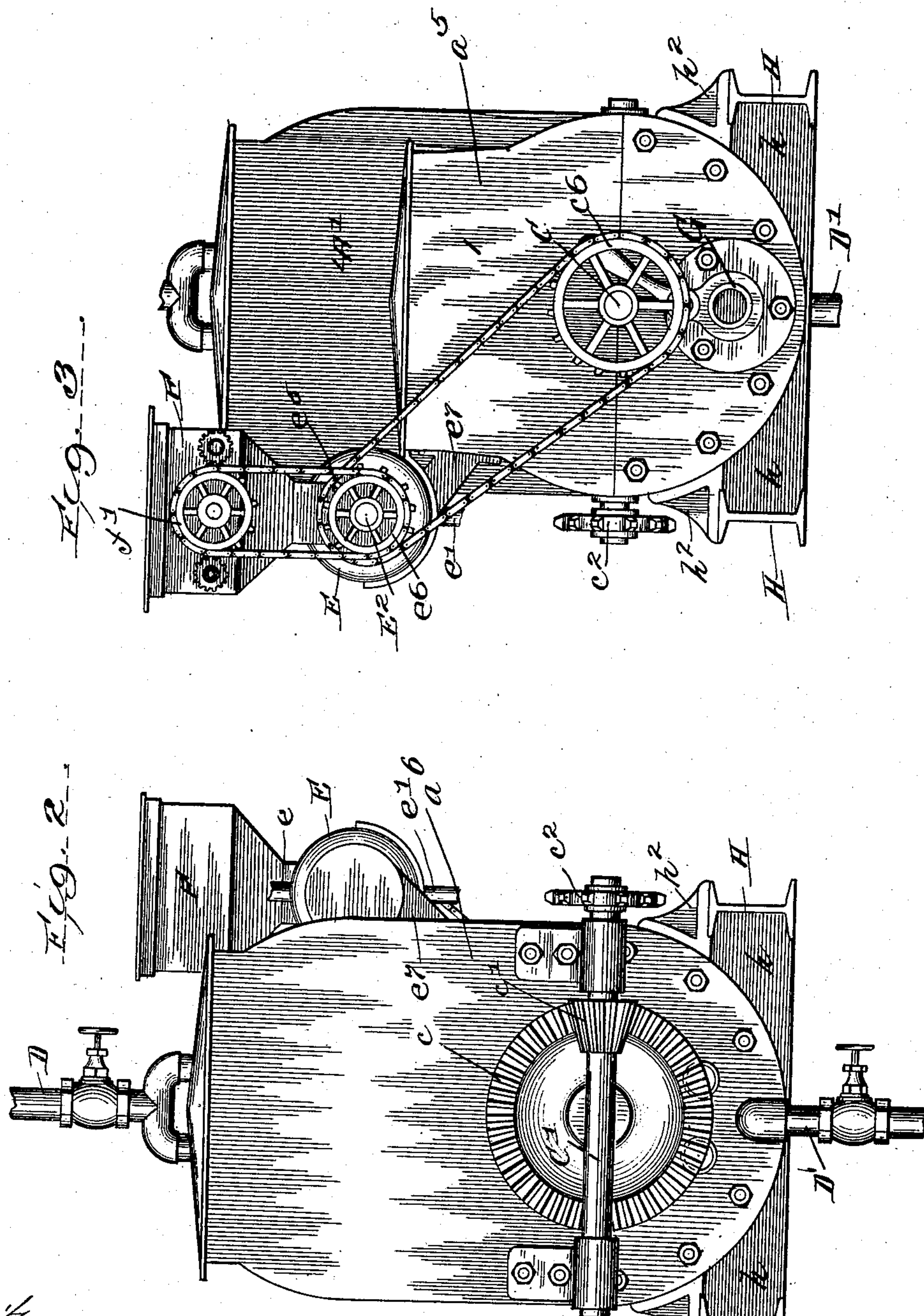
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5 SHEETS—SHEET 2.



Witnesses:
Ray B. White.
Ray White.

Inventor
Gustav A. Schillinger
By Charles W. Fie
Attorney

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5 SHEETS—SHEET 3.

FIG. 5

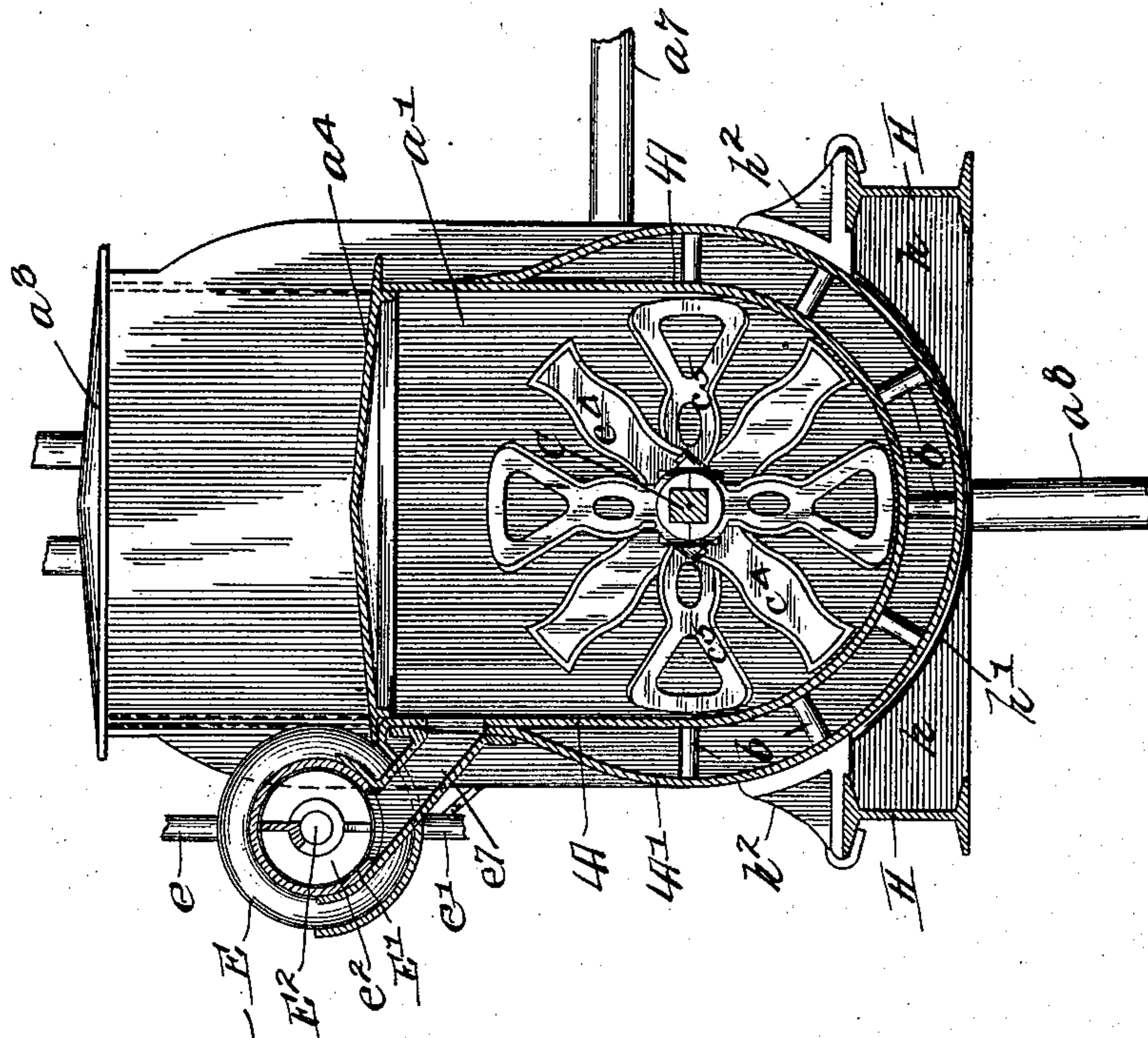
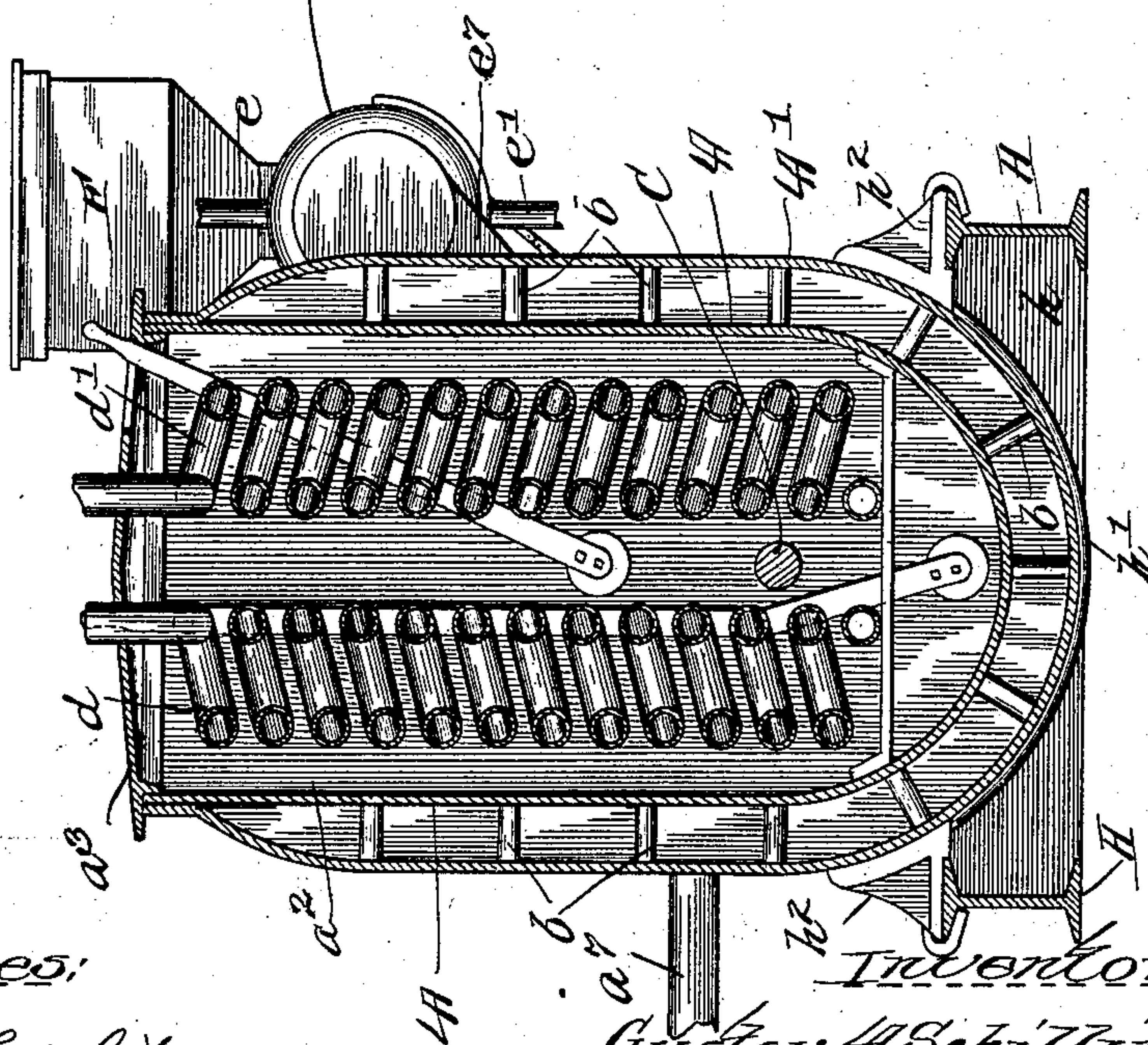


FIG. 4



Witnesses:

Ray White
Ray White

Inventor:

Gustav A. Schillinger
By Charles M. Rice
Attorney.

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5 SHEETS—SHEET 4.

Fig. 6

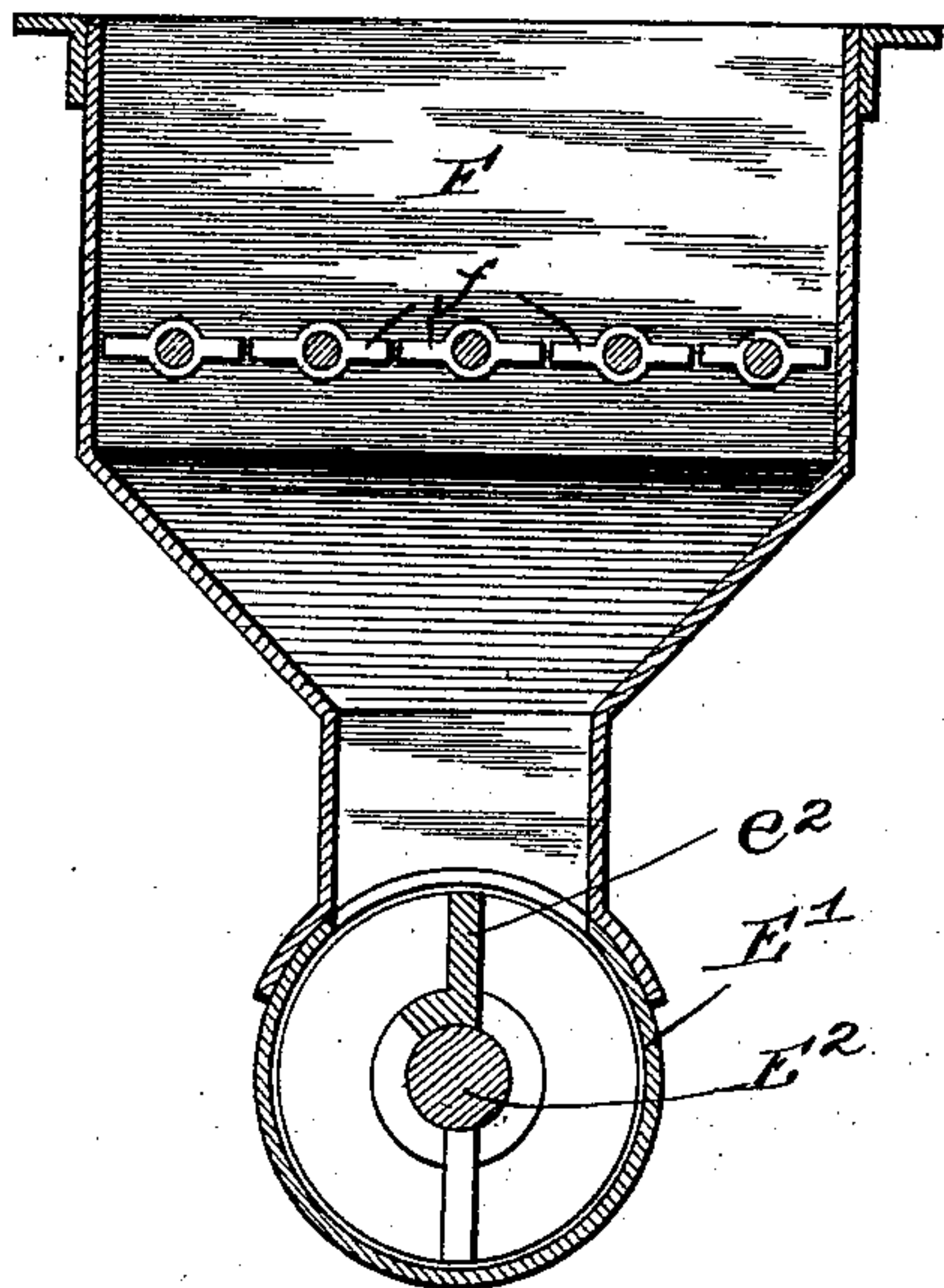


Fig. 7

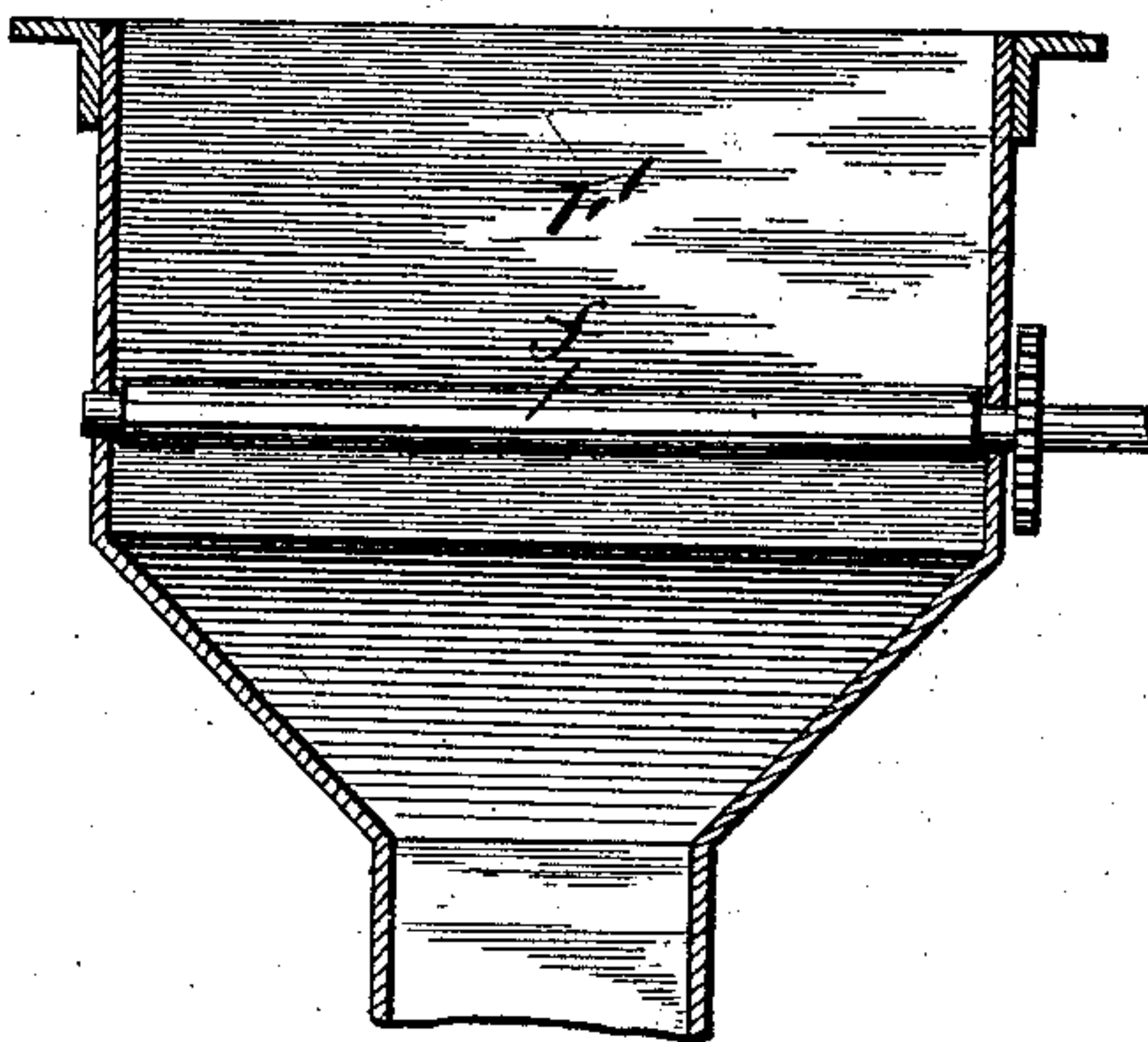


Fig. 8

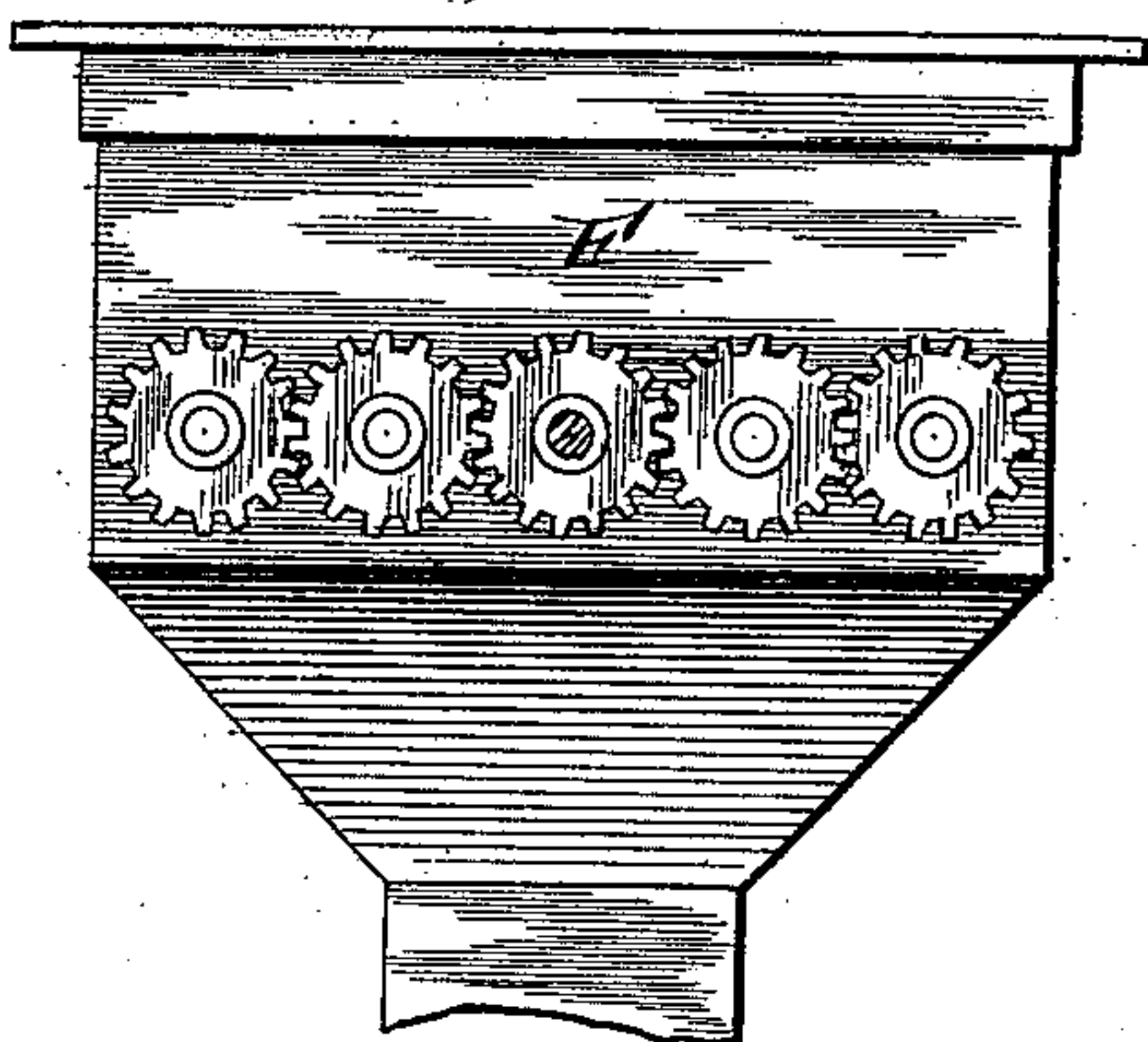


Fig. 9

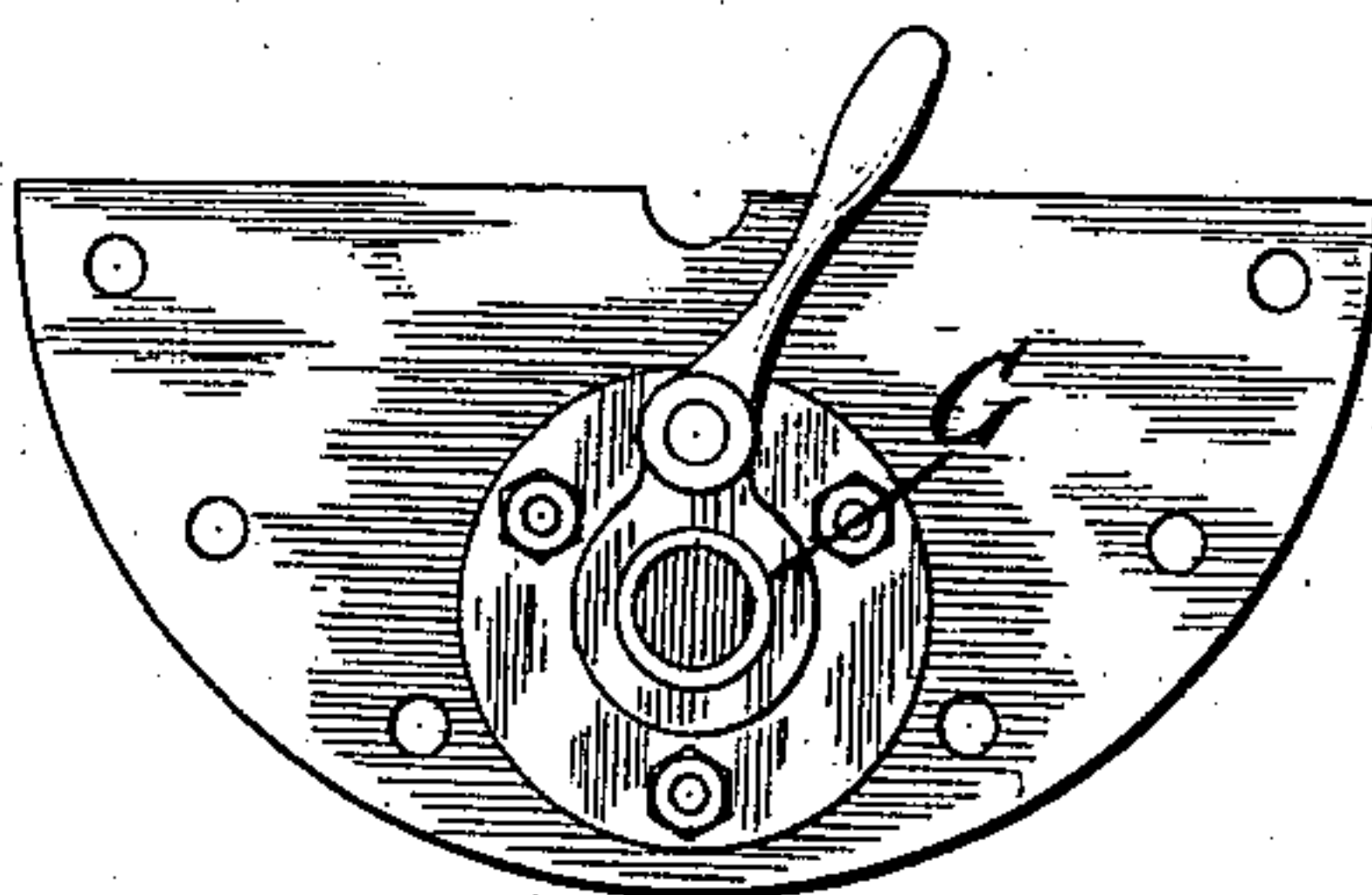
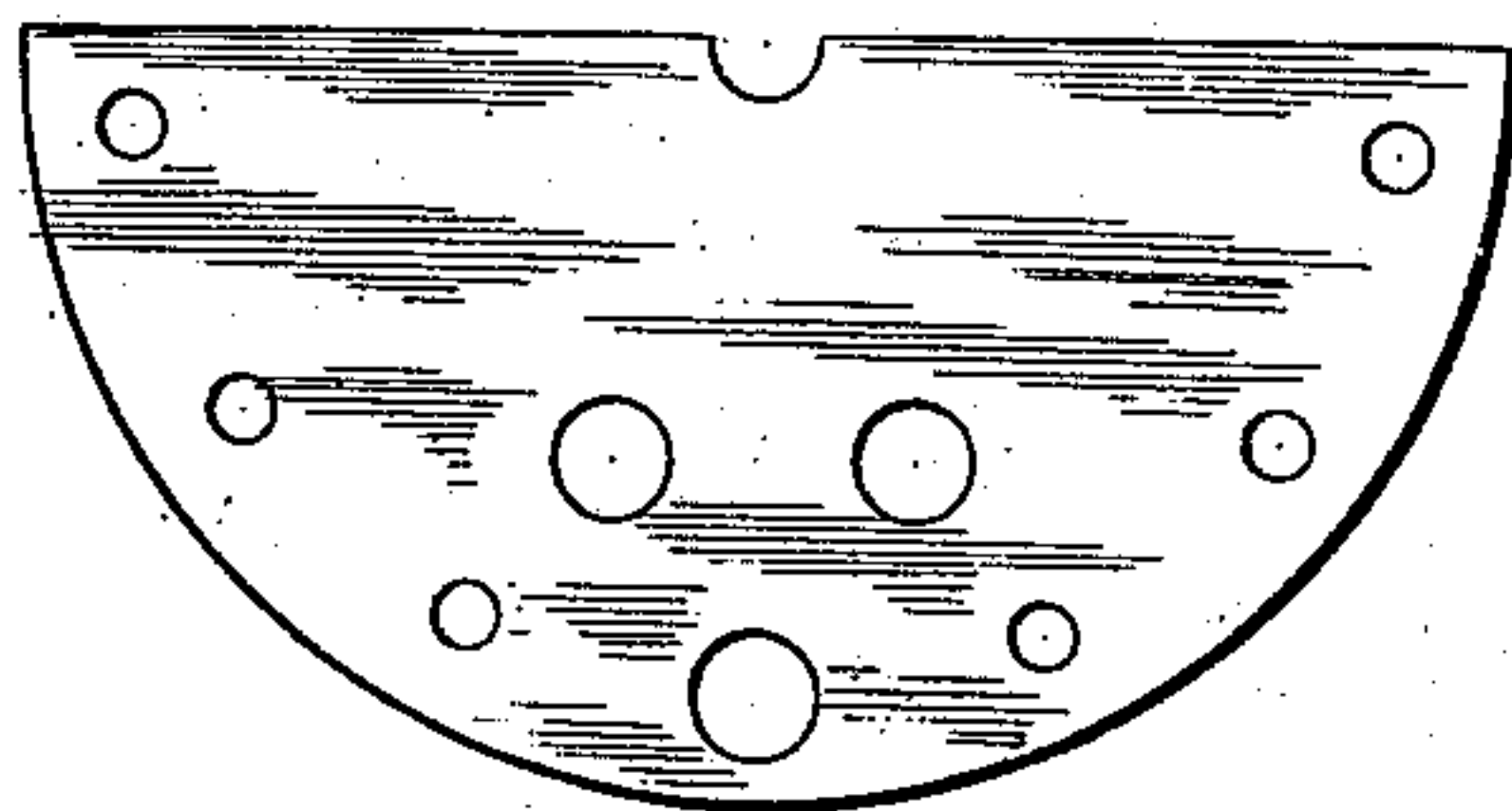


Fig. 10



Witnesses:

Harry D. White.
Ray White.

Inventor:

Gustav A. Schillinger
By Charles W. Rice
Attorney.

No. 747,653.

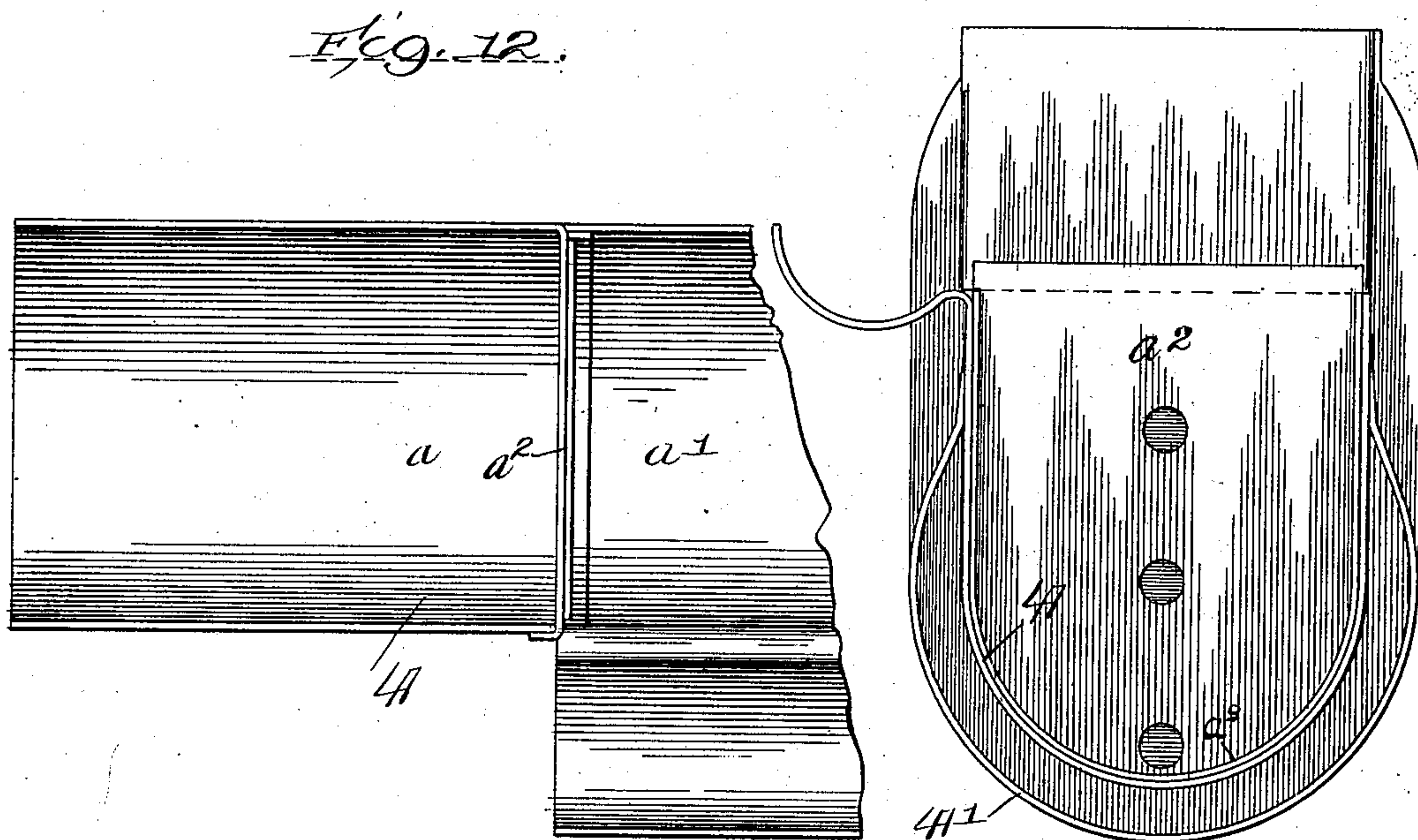
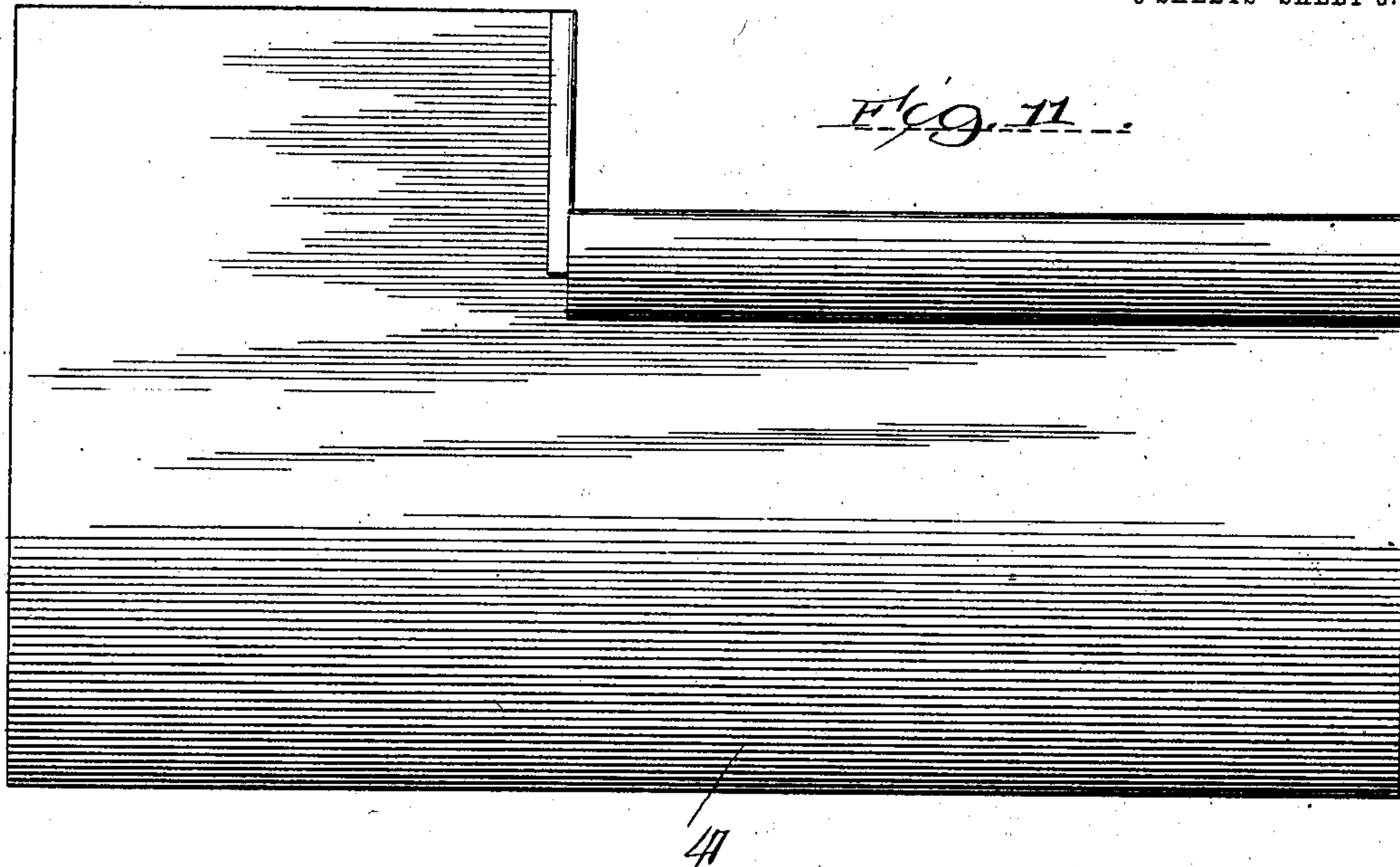
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APPLICATION FILED DEC. 6, 1901.

NO MODEL.

5 SHEETS—SHEET 5.



Witnesses:
Camp & White,
Ray White.

Inventor:
Gustav A. Schillinger
By Charles M. Rice
Attorney.

UNITED STATES PATENT OFFICE.

GUSTAV A. SCHILLINGER, OF CHICAGO, ILLINOIS.

MIXER FOR PLASTIC MATERIAL.

SPECIFICATION forming part of Letters Patent No. 747,653, dated December 22, 1903.

Application filed December 6, 1901. Serial No. 84,887. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV A. SCHILLINGER, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Mixers for Plastic Material; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates more particularly to a machine designed to mix while thoroughly heating or cooking a plastic material, such as mastic or the like.

The object of the invention is to provide a machine cheap, of large capacity, and simple operation designed to permit the material to be thoroughly heated and mixed in its passage therethrough, but protecting the same from burning.

The invention embraces many novel features of construction; and it consists in the matters hereinafter described, and more fully pointed out and defined in the appended claims.

In the drawings, Figure 1 is a fragmentary side elevation of a device embodying my invention. Fig. 2 is a rear elevation of the same. Fig. 3 is a front elevation. Fig. 4 is a section taken on line 4 4 of Fig. 1. Fig. 5 is a section taken on line 5 5 of Fig. 1. Fig. 6 is a transverse vertical section of the measuring-hopper. Fig. 7 is a longitudinal vertical section of the same. Fig. 8 is a front elevation of the same with the sprocket-wheel removed. Fig. 9 is a view of the removable front end section. Fig. 10 is a similar view of the removable portion of the rear head. Fig. 11 is a side elevation of the inner shell. Fig. 12 is a top plan view of the same. Fig. 13 is a transverse section of the inner and outer shell.

As shown in the drawings, a steam or hot-water heater is provided, comprising a boiler having an inner shell, indicated as a whole by A and divided transversely by means of the partition a^2 into two compartments a and a' , of which the compartment a' is shallower and longer.

A' indicates as a whole an outer shell or

jacket which conforms generally to the shape of the inner shell, but is of larger dimensions and in which the inner shell is secured, as shown in Figs. 4 and 13, by means of the heads a^5 and a^6 and by rigidly securing together the upper edges of each shell by means of rivets, bolts, or other means adapted to form a steam-tight joint. As shown in Fig. 4, both shells at the deeper or rear end of the same are connected by a series of sleeved rivets or bolts (indicated by b) which serve to support the inner shell upon the outer and to hold the respective walls of the shells from springing when steam or other pressure is applied thereto. A steam-inlet pipe a^7 , connected in the outer shell, leads to a boiler or other source of heat, and an outlet-pipe a^8 serves to return the water of condensation to the boiler. Located at the axis of the heater or boiler thus formed and journaled at opposite ends in the heads of the heater and in the partitions a^2 is the beater or mixer shaft C. A stuffing-box or other device for preventing the escape of fluid from the heater is provided for said shaft at each head. Driving means of any desired kind may be used. As shown, however, a beveled gear c is rigidly secured on the shaft C and a shaft C', journaled on the rear end of the heater, is provided with a beveled pinion c' , intermeshing with the beveled gear. On the extremity of the shaft C' is a sprocket or other wheel or pulley of any desired kind (indicated by c^2) adapted to receive the driving belt or chain from an engine or other motor.

Within each compartment of the heater and rigidly secured on the shaft C are the paddles or beaters. Those in the compartment a (indicated by c^3) are located in close proximity with the end walls of said chamber or compartment and are adapted to agitate the contents. The beaters c^4 c^5 , which are secured obliquely on said shaft within the compartment a' , are arranged alternately and by their rotation act to force the contents of said chamber a' or the mixing-chamber toward the front or outlet end of the machine. The beaters c^5 are apertured, so that while forcing the contents forwardly, as before described, a portion of the contents is permitted to pass through the apertures of the beaters, thoroughly mixing the same. The shaft be-

ing located axially of the heater, the extremities of said beaters, as shown in Fig. 5, extend into close relation with the bottom and side walls and scrape the contents of the compartment from the sides and bottom during the mixing operation, thereby assuring the contents of the compartment to be uniformly heated.

In the compartment *a* is provided a steam-coil, herein shown as a double coil and indicated by *d d'*. Said coils communicate with the valved pipe *D*, which leads to a boiler or other source of steam-supply, and an outlet or exhaust pipe *D'* is provided which acts to return the water of condensation to the boiler.

Valves are provided in the inner wall or partition *a²* to permit the contents of the chamber *a* to flow into the chamber *a'*. As shown, the valve-closures are provided with levers extending above the top of the compartment and adapted to be manually engaged and shifted to a position to open the valves. Each of said compartments is provided with a tight-fitting cover (indicated, respectively, by *a³ a⁴*) and which act to prevent radiation of heat and also to exclude foreign substances falling into the compartment.

Supported horizontally above and at one side of the compartment *a'* is a conveyer by means of which material may be delivered into said chamber. As shown, said conveyer consists of an upper non-rotative shell *E*, having closed ends or heads and having connected therewith the steam-inlet pipe *e* and the steam-outlet pipe *e'*, and adapted, respectively, to conduct steam thereinto from a boiler or like source of supply and to return the water of condensation thereto. Within said outer casing is an inner casing of much smaller diameter and also cylindric, and a chute *e⁷* communicates with the rear end thereof and directs material therefrom into the mixing-compartment. Extending through the inner casing is the shaft *E²*, having secured spirally thereon a rib or web *e²*, by means of which material may be forced along the inner casing to the point of delivery. At intervals along said shaft are also provided stirring-paddles *e⁴*, which act to thoroughly mix and disintegrate the material in its passage to the mixing-compartment.

Supported above the front end of the conveyer and opening thereinto is the hopper *F*. An automatically-dumping floor is provided in the bottom, comprising a plurality of rotative horizontal slats *f*, journaled at each end in the end walls of the hopper, either surface of which is adapted to form when the slats are in their closed position a continuous floor for the hopper and in their open position adapted to permit the contents of the hopper to fall into the conveyer. Means are provided for rotating said slats, comprising intermeshing gears secured on the corresponding end of each slat, and a pulley or sprocket-wheel *f'* is provided on the extended end of one of the slats and

adapted to be driven from a corresponding sprocket-wheel *e⁶*, secured on the conveyer-shaft *E²*. Pulleys or sprocket-wheels *c⁶* and *e⁵* are secured in alinement, respectively, on the shaft *C* and shaft *E²*. Sprocket-chains are trained around corresponding wheels on the shafts *C* and *E²* and *E²* and *F*.

The operation is as follows: Steam or hot water having been admitted into the heater through the pipe *a⁷* and into the coils through the pipe *D*, one of the materials usually in a semifluid or viscous state is placed in the compartment *a* and heated until raised to the desired temperature and rendered fluid. Other materials, usually granular, are delivered to the hopper *F*, which with the slats in one position serves as a measuring-box from which the contents is dumped into the conveyer when the slats rotate to their open position and from thence pass into the mixing-chamber. One or both of the valves in the partition may now be opened to admit the fluid contents or a part thereof to pass into the mixing-chamber to be thoroughly mixed with the material therein by the beaters. The granular material is heated in passing through the conveyer sufficiently to avoid chilling the fluid when admitted into the mixing-chamber, and all parts of the mastic or other preparation in the mixing-chamber are brought into contact with the bottom and sides of the inner shell by the beaters, thereby thoroughly heating the mixture and forcing the same to the delivery end of the chamber. When the mixing and heating operation is complete, the valve *G*, of any desired type, secured on the head *a⁵*, is opened and a portion of the contents of the mixing-chamber is forced therethrough into a receptacle of any desired kind for delivery. Obviously the operation is progressive and continuous, one of the materials being added to the compartment *a* as often as required, the other, if preferred, being dumped automatically into the hopper *F*, the dumping-floor of which controls the delivery of the same into the conveyer and the mixing-chamber.

For the purpose of permitting access to the respective chambers the portion of each head below the shaft *C* is adapted to be removed therefrom, as indicated in Figs. 2, 3, 9, and 10, thus enabling the operator to thoroughly clean the respective chambers. Obviously the heater may be supported in any desired manner. As shown, however, and preferably, I-beam sills *H H* are provided on each side of the heater and spaced a desired distance apart by transverse sills *h*, which abut against said I-beams and are shaped centrally on the upper surface to correspond with the bottom of the heater. Suspension-rods *h'*, provided with hooked ends, engage at each end over said I-beams and are bent to correspond with the curvature of the bottom of the heater, so that the weight of the heater and its contents acts to rigidly secure the sills together. As shown, angle-blocks

h^2 are provided on each side of the heater and through which said suspension-rods may extend, as shown in Figs. 4 and 5.

As a further improvement I have provided
 5 a simple and strong construction for the heater, which consists in forming the inner shell of a single blank, as shown in Figs. 11, 12, and 13. In this construction the excess metal above the top of the compartment α' is
 10 turned laterally, as indicated in Fig. 12, and secured on the upwardly-extending wall of the compartment α , forming the upper part of the partition α^2 , and a sheet of metal (indicated by α^9) is riveted on the lower edge of
 15 said transversely-extending portion and forms the bottom part of said partition. The excess metal on the opposite side of the casing is turned outwardly and upwardly and forms the support for the conveyer.

20 Obviously many details of construction may be varied without departing from the principles of my invention.

I claim as my invention—

1. The combination with a shell having in
 25 the top thereof upwardly-opening compartments, of a steam-coil in one of said compartments, a rotative beater having mixer-blades in the other, means for rotating said beater and a heating conveyer supported at the top
 30 of the shell and adapted to deliver material into the mixing-compartment.

2. In a machine of the class described, the combination with a shell divided into a heating and a mixing compartment of an outer
 35 shell forming a steam or water jacket therefor, a coil in the heating-compartment, an axial shaft in the mixing-compartment, beater or mixing blades on said shaft, a steam-jacketed conveyer located above the mixing-compartment and adapted to deliver material there-
 40 into and an automatic measuring-hopper adapted to receive one of the materials and deliver the same to the conveyer.

3. In a device of the class described the
 45 combination with a mixing-chamber, comprising an inner casing containing a combined beater and conveyer and an outer casing surrounding the same, outlet and inlet pipes connected with the outer casing and adapted to
 50 admit steam or hot water between the casings, a heating-chamber, a coiled pipe therein and means communicating between said chambers.

4. A combined heater, mixer and conveyer,
 55 comprising a rotative shaft, a spiral web thereon, a casing surrounding the same, an outer casing inclosing said casing, inlet and outlet pipes connected therewith and adapted to ad-

mit a heated fluid between the casings, radially-disposed mixing-blades rigidly secured
 60 on the shaft between the turns of said web, means for regulating the admission of material into the conveyer and means for discharging said material into a mixing-compartment.

5. In a device of the class described, the
 65 combination with an inner casing divided into a heating-chamber and a mixing-chamber by a valved partition, a jacket partly surrounding said casing and adapted to contain a fluid, a steam-coil in the heating-chamber, a shaft
 70 extending axially through both chambers, beaters on said shaft in each chamber, those in the mixing-chamber being set obliquely and adapted to force the material therein toward the delivery end of the compartment, a
 75 conveyer-shaft disposed approximately parallel with the beater-shaft, a spiral web on said shaft, mixing-blades thereon, a steam-jacketed casing surrounding the shaft-web and beater-blades, the outer end of said conveyer
 80 communicating with a hopper and the inner end thereof communicating with a chute adapted to direct material therefrom into the mixing-chamber, said hopper and conveyer being operated from the mixing-shaft. 85

6. In a machine of the class described, a sheet-metal casing divided into a heating-chamber and a mixing-chamber, a steam-jacket surrounding said chambers, heads for the jacket and casing, the bottom portion of
 90 each head being removable to permit access to the interior of the casing.

7. In a device of the class described, a metallic casing divided transversely to form two
 95 chambers of unequal depth, an outer casing corresponding in shape with the inner casing and forming a steam-jacket therefor, sleeved stay bolts or rivets connecting said casings, a metallic head for the casings at each end and a close-fitting cover for each compartment. 100

8. In a device of the class described, a heater containing two upwardly-opening compartments, a tight cover for each compartment, said heater comprising an outer and an inner
 105 casing adapted to contain steam or hot water, the inner casing provided with a laterally-projecting integral flange adapted to support a conveyer.

In testimony whereof I have hereunto subscribed my name in the presence of two
 110 subscribing witnesses.

GUSTAV A. SCHILLINGER.

In presence of—

ANNA B. HILLS,
 L. J. DELSON.