

G. F. DICKSON.

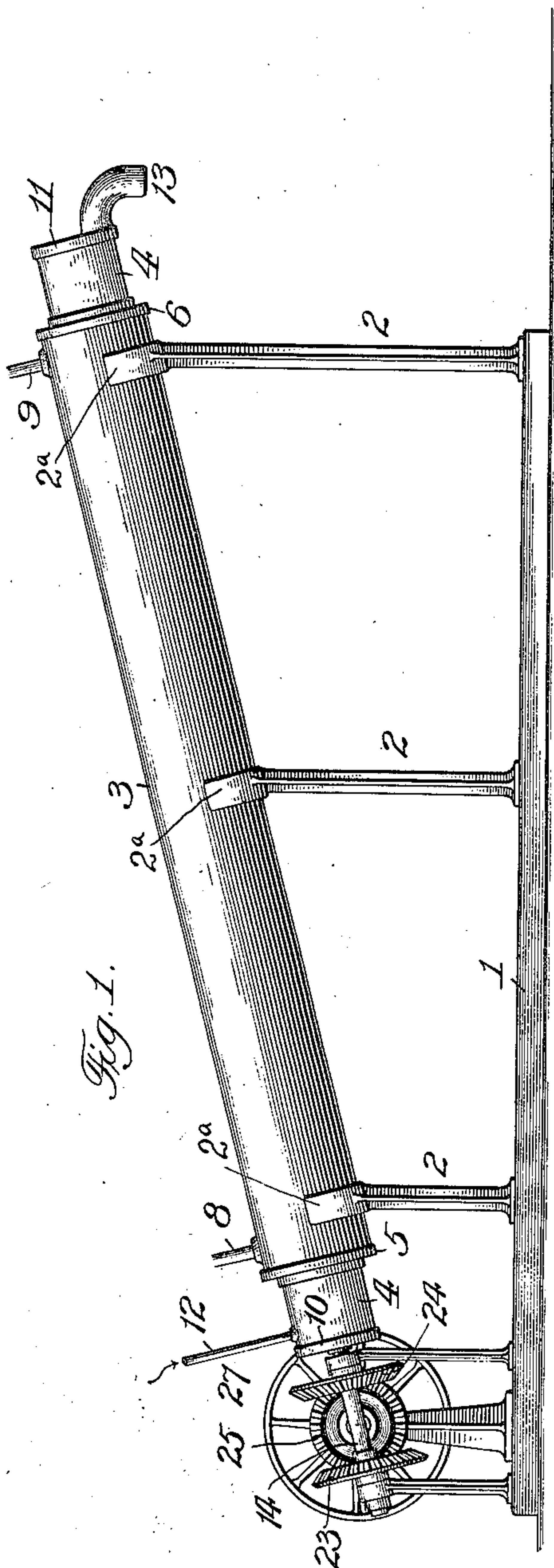
FREEZER.

APPLICATION FILED JAN. 29, 1906.

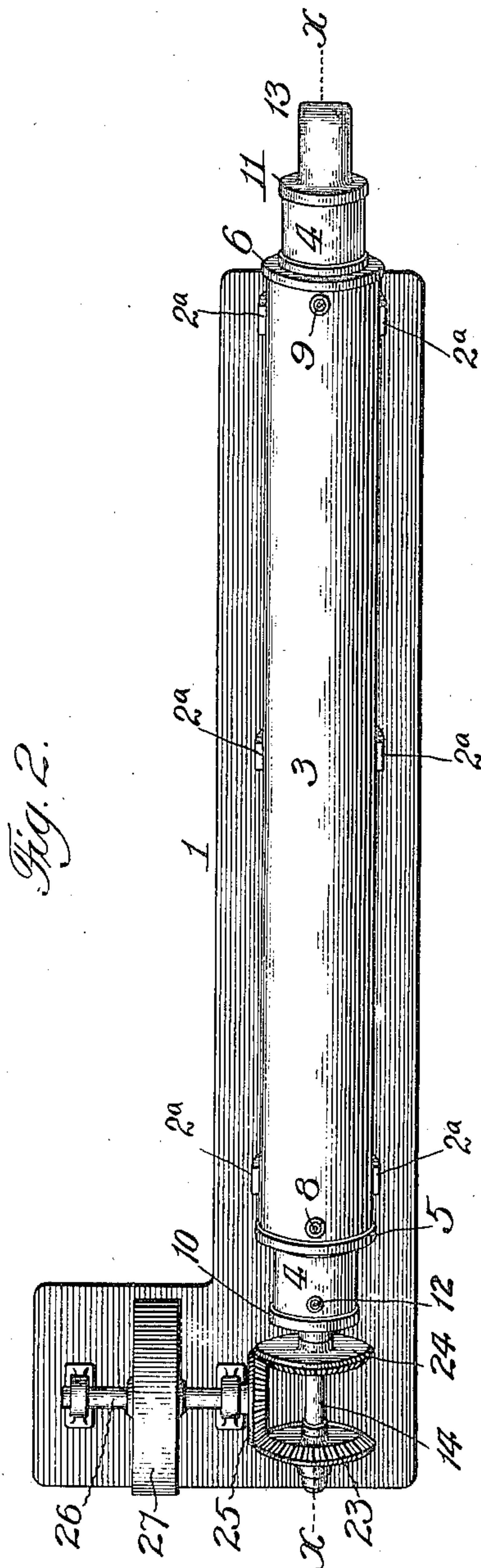
952,030.

Patented Mar. 15, 1910.

2 SHEETS—SHEET 1.



Attest:
John Enders,
M. H. Holmes



Inventor:
George F. Dickson
by Robert Burns
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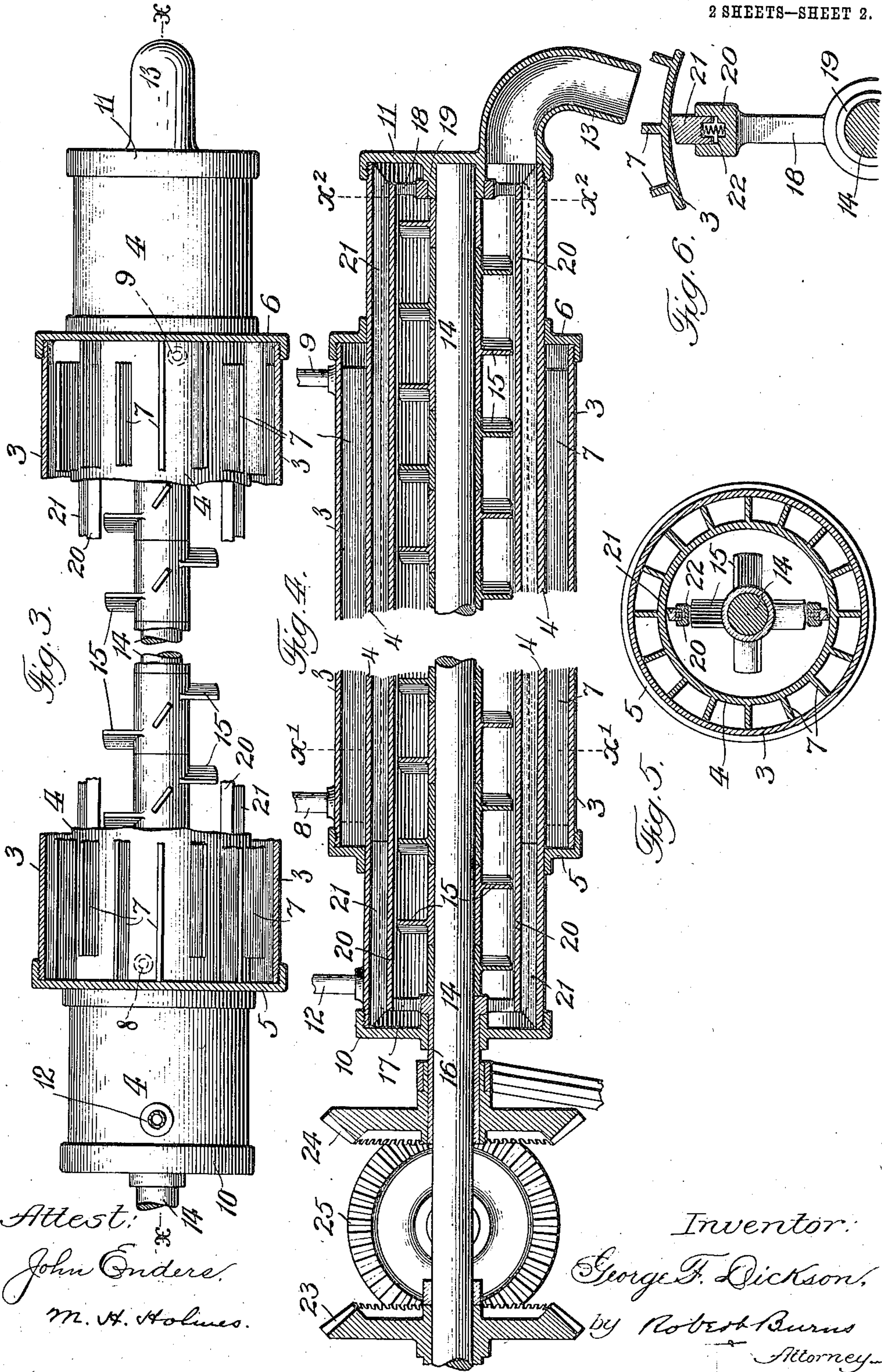
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UNITED STATES PATENT OFFICE.

GEORGE F. DICKSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO CONFECTIONERS AND BAKERS SUPPLY CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

FREEZER.

952,030.

Specification of Letters Patent. Patented Mar. 15, 1910.

Application filed January 29, 1906. Serial No. 298,364.

To all whom it may concern:

Be it known that I, GEORGE F. DICKSON, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Freezers, of which the following is a specification.

This invention relates to freezing apparatus for the production of ice-cream and like flavored ices, and has for its object to provide a simple and efficient structural arrangement and combination of parts, whereby the formation of the aforesaid frozen ices is attained in a rapid, continuous and economical manner, and with which the material from which such ices are formed is kept in constant movement during the operation to attain a uniform grade in the finished product.

In the accompanying drawings: Figure 1, is a side elevation. Fig. 2, is a plan view. Fig. 3, is an enlarged fragmentary top view, with parts broken away to illustrate the internal construction of the freezer. Fig. 4, is an enlarged detail longitudinal section on line $x-x$, Figs. 2 and 3. Fig. 5, is a transverse section on line $x'-x'$, Fig. 4. Fig. 6, is an enlarged detail transverse section on line x^2-x^2 , Fig. 4, illustrating a scraper blade and its accessories.

Similar numerals of references indicate like parts in the several views.

Referring to the drawings, 1 represents a base provided with a series of uprights or standards 2 for the support of the hereinafter described casings of the freezing chambers, and for the carrying shaft of the stirrers etc. of the same.

3 is an outer cylindrical casing fixedly secured on saddles 2^a at the upper ends of a set of the aforesaid standards 2, and preferably in a direction inclined from the horizon for the purpose hereinafter stated.

4 is an inner cylindrical casing arranged in concentric relation within the aforesaid outer casing 3, and attached thereto by annular end heads 5 and 6, of the usual flanged form shown. Such construction provides a closed annular chamber between the two casings through which the cooled brine or other like cooling medium is pumped as usual in the present class of cooling apparatus.

7 are a series of longitudinal partitions

arranged radially in the above described annular chamber, to divide the same into a series of sub-chambers or passages which are alternately connected together at their opposite ends by orifices in the end portions of said partitions, or by the entire removal of such end portions as shown in Fig. 3. With such construction a circuitous passage is formed for the circulation of the brine or other cooling fluid used in the apparatus.

8 is the inlet neck or pipe for the cooling fluid, and 9 is the outlet neck for the same; such pipes are connected to the circulating pump by which the brine or like cooling medium is circulated in manner common to refrigerating apparatus.

10 and 11 are closure heads secured in a detachable manner to the respective ends of the aforesaid inner cylinder or casing 4, to provide a closed freezing chamber for the cream or like material to be frozen, and such chamber in the preferred form of the present improvement has a much greater length than diameter, and extends in a direction inclined from the horizon, as shown.

In the construction shown, the detachable connection of said closure heads 10 and 11, comprises interiorly screw-threaded marginal rims on said heads having engagement with correspondingly formed end portions of the cylinder or casing 4, as shown more particularly in Figs. 3 and 4. With such arrangement access to the interior of the casing for cleansing purposes, as well as for the removal of the agitating means hereinafter described, is very conveniently attained.

12 is the inlet neck through which the material to be frozen enters into one end of the freezing chamber aforesaid, and 13 is the outlet neck at the other end of said chamber for the outflow or discharge of the frozen material. Said outlet neck 13, is preferably downturned as shown to prevent splashing of the frozen material, and is preferably carried by the end closure head 11 so as to be removable therewith.

14 is a revoluble shaft arranged axially within the freezing chamber and provided with a longitudinal series of beater blades 15, which are preferably inclined to the circular plane of rotation of said blades, so as to tend to move the material toward the outlet neck 13 of the freezing chamber during their operation of beating or stirring the material.

16 is a hollow shaft surrounding the aforesaid axially arranged shaft 14 and fitting and turning thereon. Said shaft 16 extends through a central orifice in the aforesaid closure head 10, and at its end within the freezing chamber and closely adjacent to the head 10 thereof, is provided with a spider 17, to the outer ends of which are attached the series of longitudinal scraper blades herein-
after described.

18 is a corresponding spider arranged at the opposite end of the freezing chamber and journaled upon an annular collar 19 on the inner face of the closure head 11, as shown in Fig. 4. With such arrangement the bore of the collar 19 forms the bearing for the forward end of the axially arranged shaft 14, above described.

20 are a series of channel bars extending longitudinally within the freezing chamber and secured at their respective ends to the aforesaid spiders 17 and 18. The longitudinal channels in said bars constitute containing cavities for the series of scraper blades by which the frozen material is removed from the inner circular wall surface of the freezing chamber, as fast as it accumulates thereon.

21 are the series of scraper blades above referred to. Each blade preferably consists of a number of sections placed end to end in the longitudinal channels of the channel bars 20 aforesaid.

22 are a series of springs arranged between the scraper blades 21 and the channel bars 20, and adapted to yieldingly hold said scraper blades in contact with the inner circular wall of the freezing chamber.

23 is a bevel gear attached to the rear end of the axial shaft 14 aforesaid, and 24 is a companion bevel gear secured to the hollow shaft 16 aforesaid, the said bevel gears being in separated relation as shown.

25 is a driving bevel gear meshing with the aforesaid bevel gears 23 and 24, and adapted to rotate the same in opposite directions, and attain a corresponding rotation in opposite directions of the beater blades 15 and the scraper blades 21; the reverse operation of said parts having from extended practical experience been found to materially aid in the production of ice-cream and other ices of the desired granular nature.

26 is a countershaft carrying the bevel gear 25, and provided with a driving pulley 27 for belt connection with a suitable power source.

A material part of the present improvement consists in the arrangement of the freezing chamber, formed of a small diameter as compared with its length, in a fixed position inclined from a horizontal, with the inlet for the cream or like materials at

its lower end, and with the outlet for the frozen material at its upper end. With such arrangement the natural expansion of the material in passing from the original liquid condition to the ordinary and natural condition of ice-cream, with an increase in volume from 35 to 60 per cent., is utilized in a very effective manner in causing the movement of the material through the freezing chamber, and a discharge through the outlet end thereof in a continuous manner of the frozen ice cream, such action being aided in some cases by an inclined arrangement of the beater blades, as for instance, in cases where the composition used is incapable of taking on the granular nature of high grade ice-cream. Under ordinary conditions, however, such blades need only perform the functions of beating the material and forcing the same out against the wall of the freezing chamber.

Having thus fully described my said invention what I claim as new and desire to secure by Letters Patent, is:—

1. In a freezer, the combination of a casing, means for cooling the exterior of said casing, means for supporting the casing in a fixed upwardly inclined position, a closure head secured to the lower end of said casing, a removable closure head secured to the upper end of said casing and provided with an outlet neck, an inlet neck connected to the lower end of the casing, rotary agitating means arranged in the interior of the casing and provided with a carrying shaft journaled in the aforesaid closure heads, and means for imparting rotation to said shaft.

2. In a freezer, the combination of a casing, means for cooling the exterior of said casing, means for supporting the casing in a fixed upwardly inclined position, a closure head secured to the lower end of said casing, a removable closure head secured to the upper end of said casing and pivoted with an outlet neck, an inlet neck connected to the lower end of the casing, rotary agitating means arranged in the interior of the casing and comprising two oppositely rotating parts, an inner and an outer one, the inner part having material engaging blades to move the material toward the circular inner wall of the casing and the other part provided with a material engaging blade having scraping engagement with said inner wall of the casing, and means for rotating said parts in opposite directions.

Signed at Chicago, Illinois, this 27th day of January 1906.

GEORGE F. DICKSON.

Witnesses:

ROBERT BURNS,
M. H. HOLMES.