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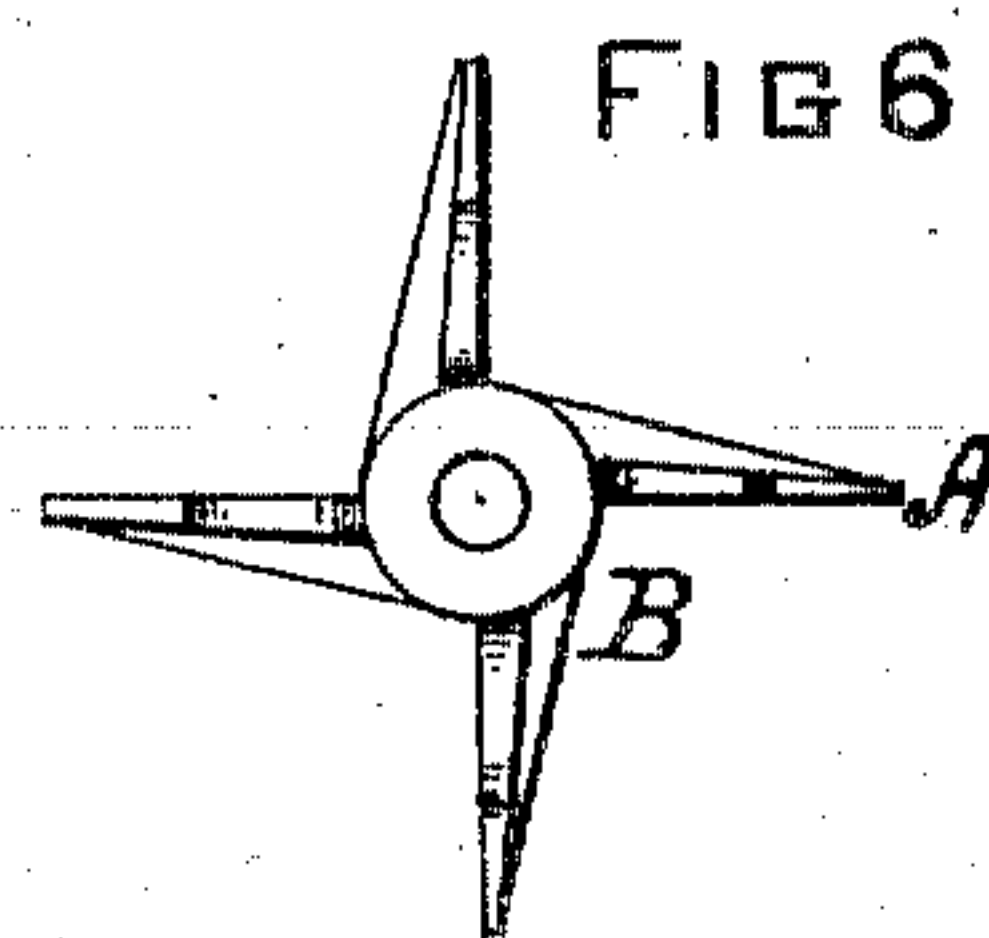
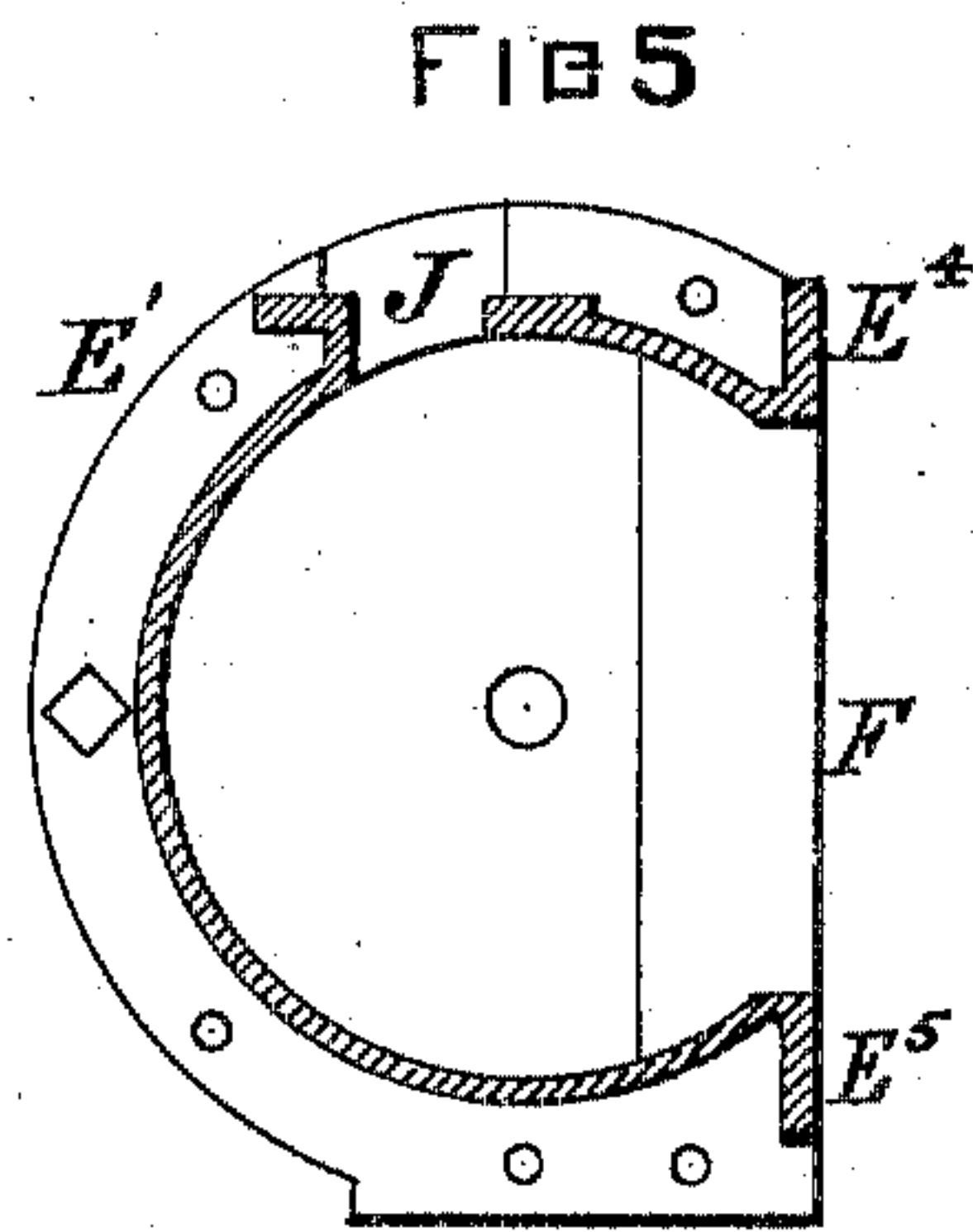
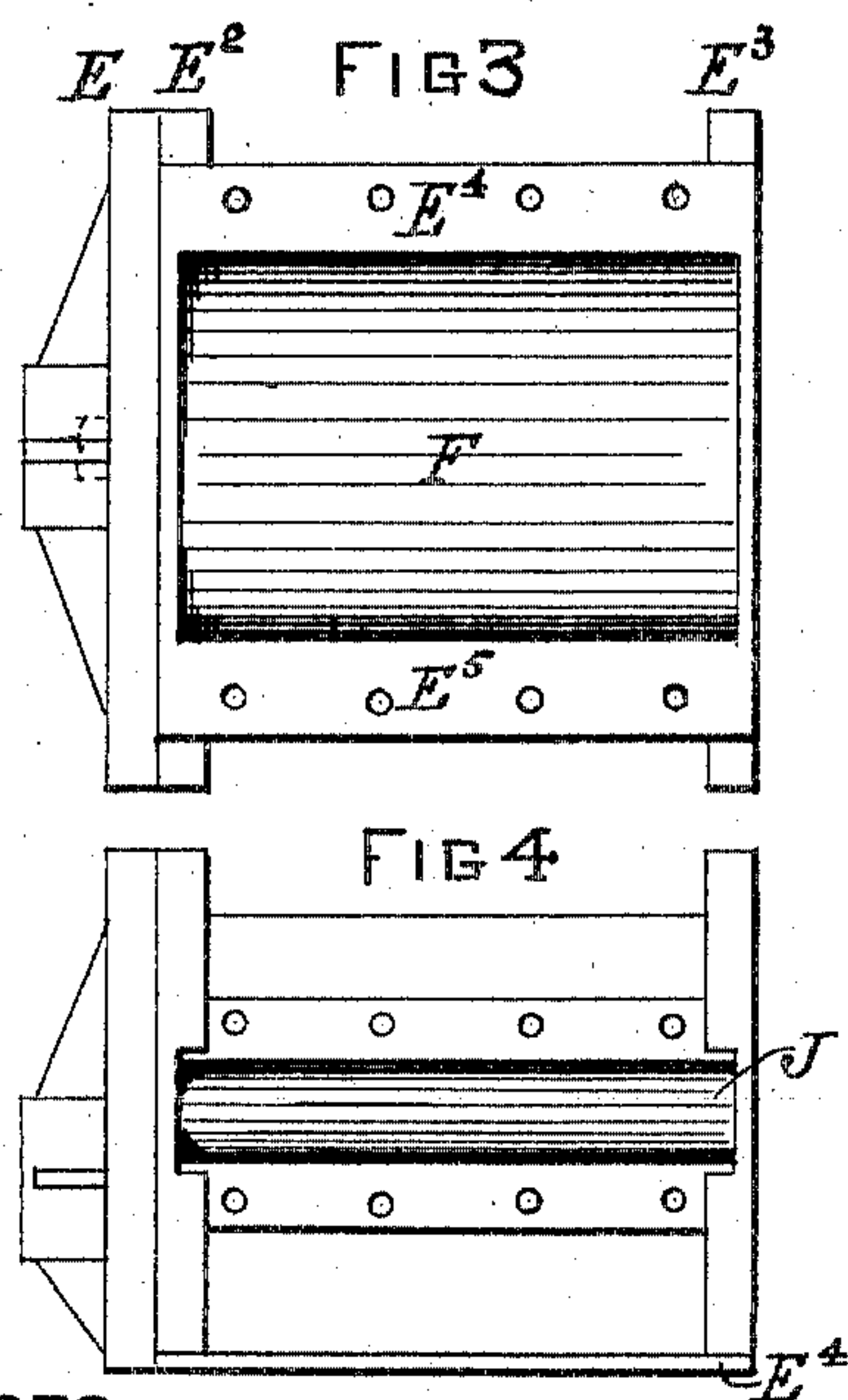
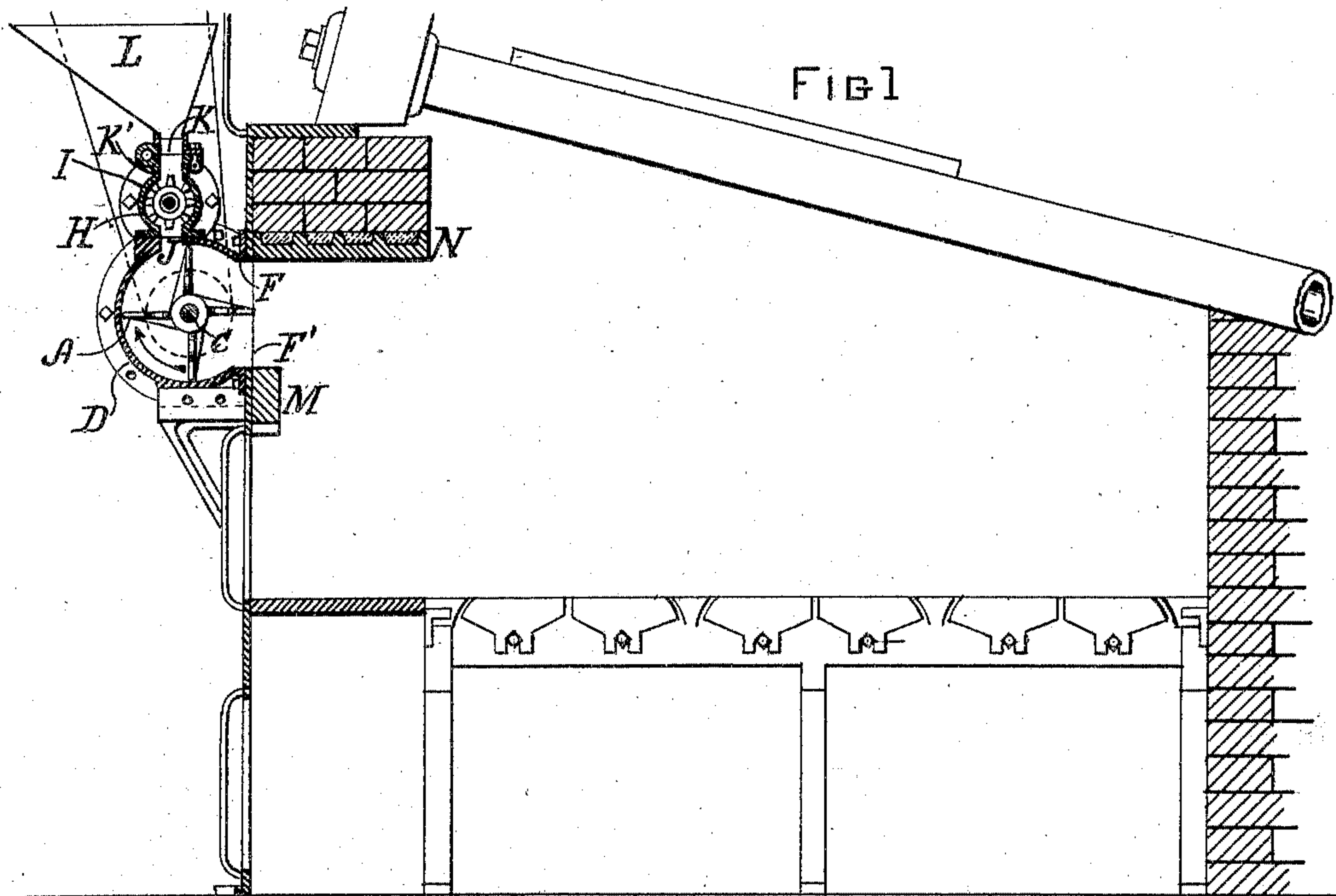
PATENTED AUG. 9, 1904.

J. & W. REAGAN.
MECHANICAL STOKER.

APPLICATION FILED NOV. 16, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

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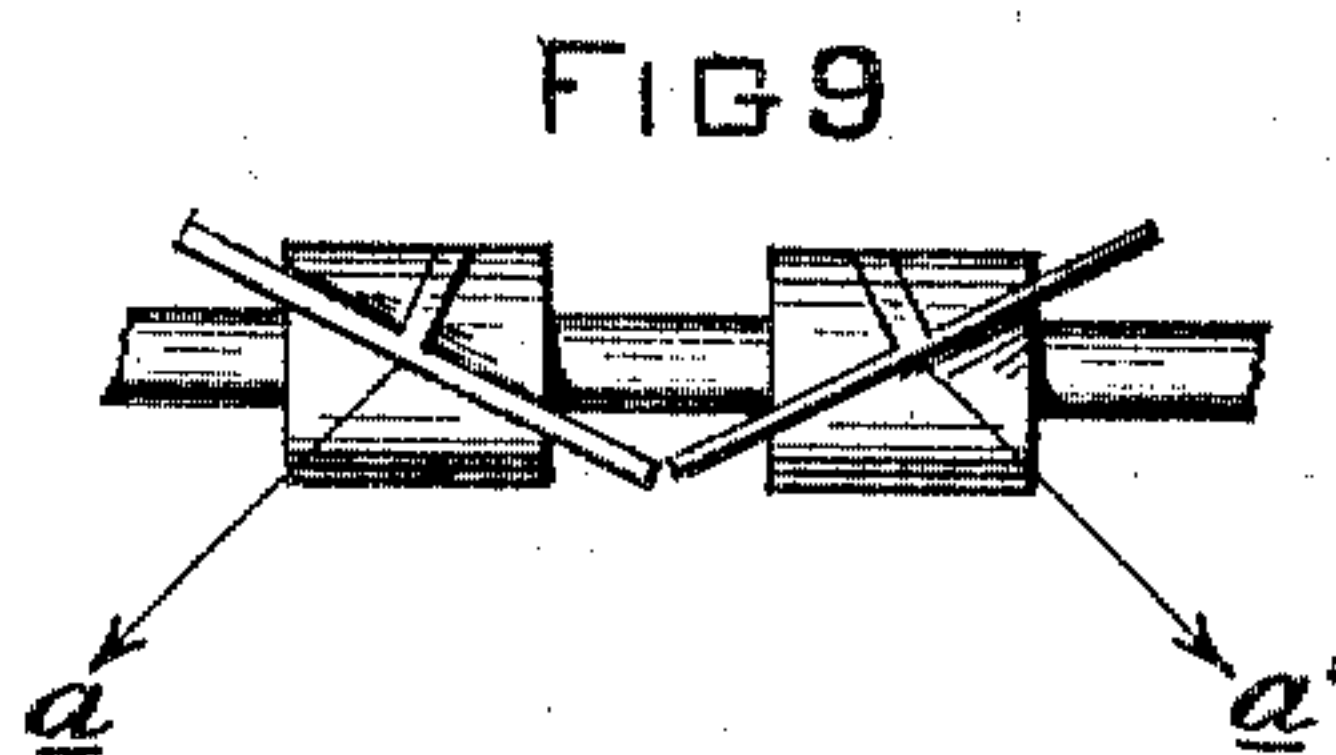
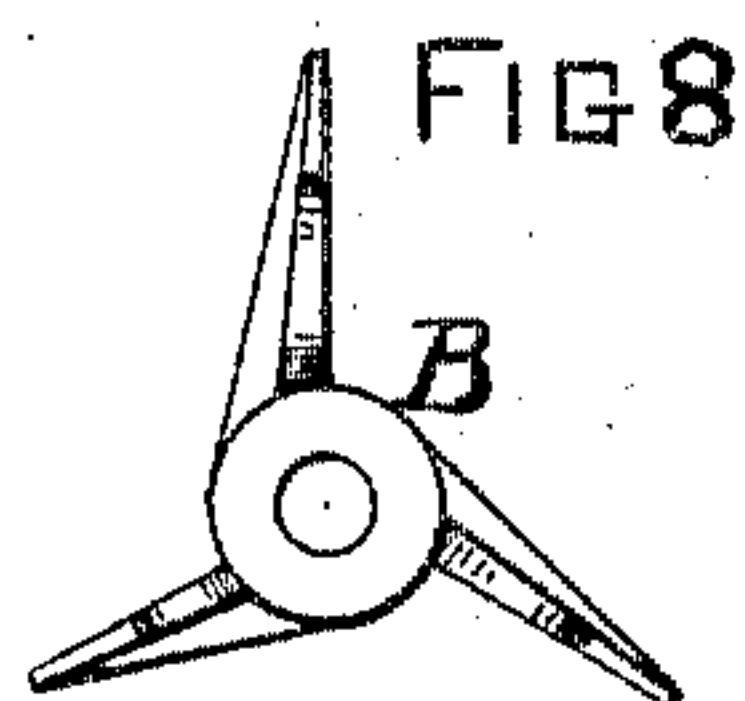
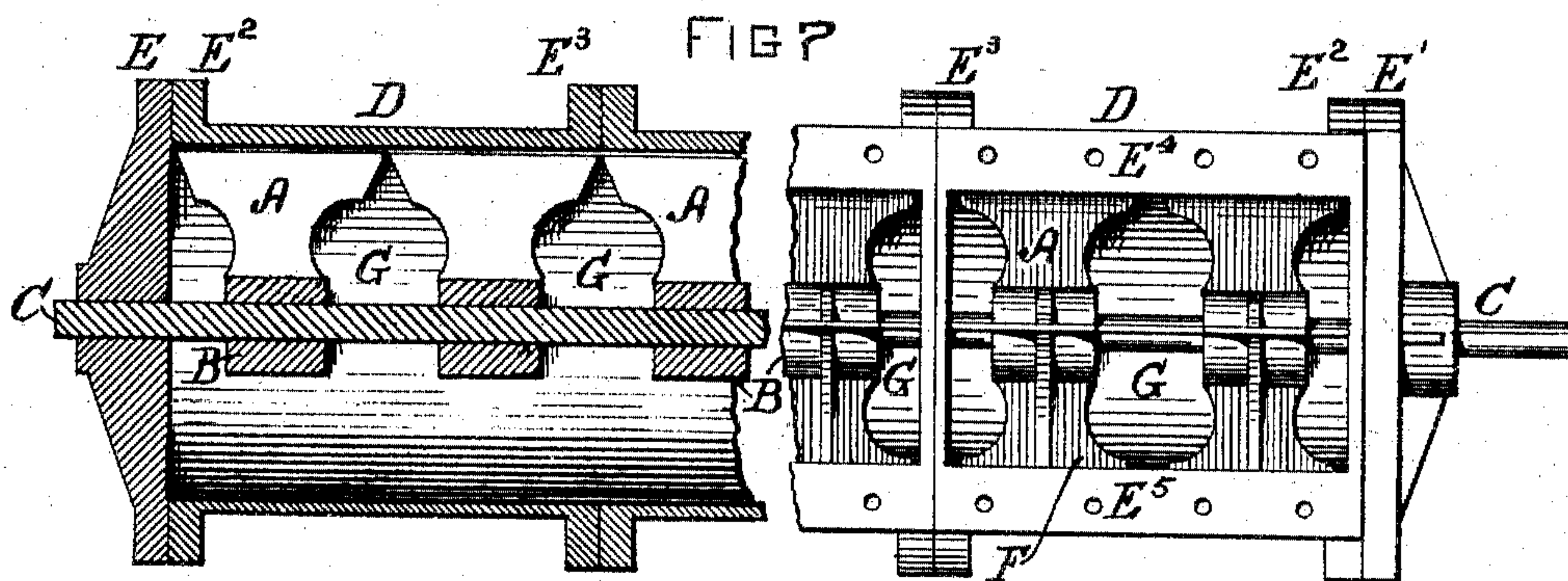
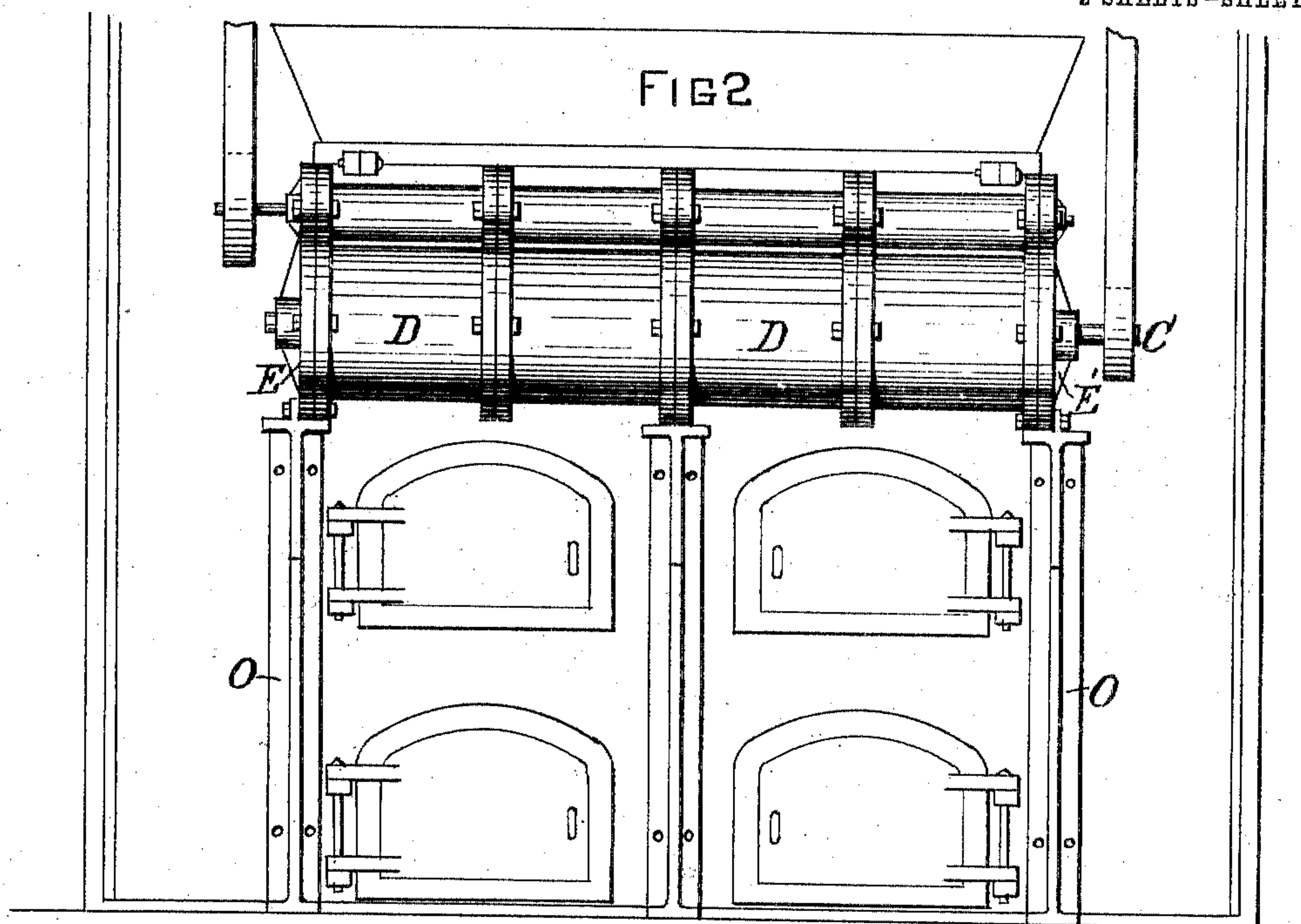
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NO MODEL.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JAMES REAGAN AND WILLIAM REAGAN, OF PHILADELPHIA, PENNSYLVANIA.

MECHANICAL STOKER.

SPECIFICATION forming part of Letters Patent No. 767,082, dated August 9, 1904.

Application filed November 16, 1903. Serial No. 181,421. (No model.)

To all whom it may concern:

Be it known that we, JAMES REAGAN and WILLIAM REAGAN, citizens of the United States of America, and residents of the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Mechanical Stokers, of which the following is a specification.

Our invention relates to certain improvements in mechanical stokers in which fine fuel is fed to boiler-furnaces; and the object is to construct the same so as to project the coal forcibly into the furnace without creating a draft over the top of the fire and to maintain a bed of fuel of even thickness over the entire surface, thereby promoting combustion and increasing the efficiency of the boiler.

Our invention consists of a series of wheels provided with flat or curved blades mounted within a cylindrical casing bolted to the boiler-front and communicating with the furnace through an opening of ample proportions to insure a free passage of fuel and facilitating the spreading of same over the fire-surface when the blades are in operation, the construction being such that the fuel will not become choked up or the air compressed within the casing to interfere with the proper working of the stoker.

Reference is had to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section through our mechanical stoker and boiler-furnace. Fig. 2 is a front elevation of a boiler-front, showing our invention applied. Fig. 3 is a side view of the cylindrical casing employed in our invention. Fig. 4 is a plan view of same. Fig. 5 is a transverse section through same. Fig. 6 is an end view of the revolving blades used in throwing the coal. Fig. 7 is a side view, partially in section, of the cylindrical casing detached from the boiler-front and showing a series of revolving blades mounted therein. Fig. 8 is an end view of a hub carrying varying radial blades which may be employed, if necessary, to throw the fuel alternatively onto the front, midway, or back of the fire-furnace. Fig. 9 is a plan view of blades set at an angle to the horizontal axle to insure the spreading of the coal more thor-

oughly toward the right and left if it should be found necessary to do so.

The blades A, Figs. 1, 6, and 7, constituting part of the wheels for throwing the fuel, may consist of two or more in number projected radially from a hub B, which in turn is mounted upon a central longitudinal axle C within the cylindrical casing D, Figs. 1, 2, and 7, the said axle C having its bearings in the flanges or heads E E at each end of the casing.

The cylindrical casings D, Figs. 1, 2, 3, 4, 5, and 7, are bolted together in sections by means of flanges E² and E³ on each end and form one continuous cylinder in length according to the width of the furnace. Within these casings are mounted, as stated, the revolving blades A, forming wheels, which are adjusted on the axle, extending in line from end to end of said casings, as shown in Fig. 7. The casings D are secured, by means of side flanges E⁴ and E⁵, Figs. 3, 5, and 7, to the boiler-front directly above the fire-doors in such manner as not to interfere with the opening or closing of same, and in order to form an outlet for the fuel the side adjacent to the boiler-front is provided with an eduction-opening F, which communicates through an opening F', Fig. 1, with the furnace proper.

In our description we have referred to a "cylindrical" casing and shown a stoker so fitted; but it is to be understood that this is only a convenient form, and the shape of the inclosing case and is not essential to our invention.

It is essential that the eduction-opening F and corresponding opening F' in the boiler-front be made of such capacity as to insure a free outlet; otherwise they would become choked or stopped up and the coal would be simply carried or whirled around by the revolving blades within the casing by the action of the blades if the apertures were small and would create a draft or blow the fires more than would be at times requisite.

The blades A of each wheel are not made of uniform width, being wider at their outer extremities and narrow at or near the hub B, which is of reduced length, so that when a series of blades are placed in line within the

casing, as shown in Fig. 7, their adjacent edges will not be in actual contact, but an open space G will remain between them for the free passage and circulation of air. The air thus circulating around when the blades are in motion will not become compressed at any particular point. Neither is the fuel liable to become packed, which would be the case if the edges of the blades fitted closely together. The machine will thus rapidly free itself as the coal is fed. The said blades A, which are arranged to forcibly throw and scatter the fuel, are caused to revolve forward and over in the direction of the furnace, so as to project the fuel evenly from the dead-plate to the bridge-wall and extending the full width of the furnace. In throwing the fuel during the upper half of the revolution instead of during the lower half it will descend more freely over the entire surface and insure a bed of fuel of uniform thickness and the fuel will be thrown more in a direct line with the grate-surface and low down.

Heretofore where stokers have been used with a fan-wheel the air has been compressed within the cylinder and blown out, creating a draft over the top of the fire, which is detrimental to same, and it is to avoid this that our invention partly appertains.

A crusher or feeder consisting of one or more toothed rollers H, working within a cylinder I, may be secured to the upper side of the casing D, Figs. 1 and 2, and discharge the fuel through a slot or aperture J, Figs. 1, 4, and 5, onto the revolving blades A, the fuel being fed through a neck K on the lower portion of the hopper I, which is connected, by means of a hinged joint, to a neck K on the upper part of the cylinder or casing D in order to permit the hopper to be turned down out of the way when it is desired to open the flue or uptake doors. The fuel is fed from the hopper and passes downward between the toothed roll or rollers onto the revolving blades.

In order to thoroughly distribute the fuel directly over the grate-surface, the arch-plate over the fire-doors is removed and the boiler-front and the lower part of the stoker protected from the heat of the furnace by means of fire-bricks M, as shown in Fig. 1, and over the top of the opening F' is placed a plate or girder N, protected with fire-brick. By arranging the furnace thus no obstruction remains to impede the full delivery of the coal.

The stoker is bolted, as stated, to the boiler-front above the fire-doors and is further supported on legs O at the ends and in the center, as shown in Fig. 2.

Power may be applied to the axle C from any suitable or convenient motor, and the proper distribution of the fuel may be governed or controlled by increasing or diminishing the speed of the blades.

The fuel distributor or spreader (shown in Fig. 8) is composed of varying radial blades in order to throw the coal different distances—that is to say, onto the front, midway, or back of the fire-surface—and the blades may be set at an angle to the horizontal axle, as shown in Fig. 9, to throw the coal more to the right and left, as indicated by arrows *a a'*. Either one of these modifications may be employed if at any time it should become desirable.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a fuel-distributing device, beaters or throwers so shaped as to prevent forcing the air into the furnace or the accumulation of air-pressure within the device itself, substantially as described.

2. In a fuel-distributing device, beaters or throwers so shaped as to prevent forcing the air into the furnace or the accumulation of air-pressure within the device itself, such beaters or throwers being so proportioned as to give an even distribution of fuel over the whole surface of the fire when operated at a proper constant speed, substantially as specified.

3. In a fuel-distributing device a series of beaters or throwers so shaped and proportioned as to prevent forcing air into the furnace or the accumulation of air-pressure within the device itself, and to give an even distribution of fuel over the whole surface of the fire when operated at a proper constant speed, and a casing made in sections so as to permit of ready adaptation to varying widths of furnaces substantially as specified.

4. In a fuel distributor or spreader a series of varying radial blades set at an angle with the horizontal axle and so shaped as to prevent forcing air into the furnace or the accumulation of air-pressure within the device itself, the said blades being also so proportioned as to give an even distribution of fuel over the whole surface of the fire when operated at a proper constant speed, and with a casing made in sections so as to permit of ready adaptation of varying widths of furnace, substantially as described.

5. A fuel-feeder for furnaces having a casing, and means acting across the path of the fuel and situated within said casing for distributing fuel over the various portions of the grate, said means being so shaped as to prevent forcing air into the furnace, substantially as described.

Signed by us at Philadelphia, Pennsylvania, this 13th day of November, 1903.

JAMES REAGAN.
WILLIAM REAGAN.

Witnesses:

RICHARD McELROY,
ROBERT OSBORNE, Jr.