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PATENTED FEB. 20, 1906.

A. L. J. QUENEAU.
APPARATUS FOR CHARGING RETORT BENCHES.

APPLICATION FILED JAN. 16, 1905.

5 SHEETS—SHEET 1.

Fig. 1.

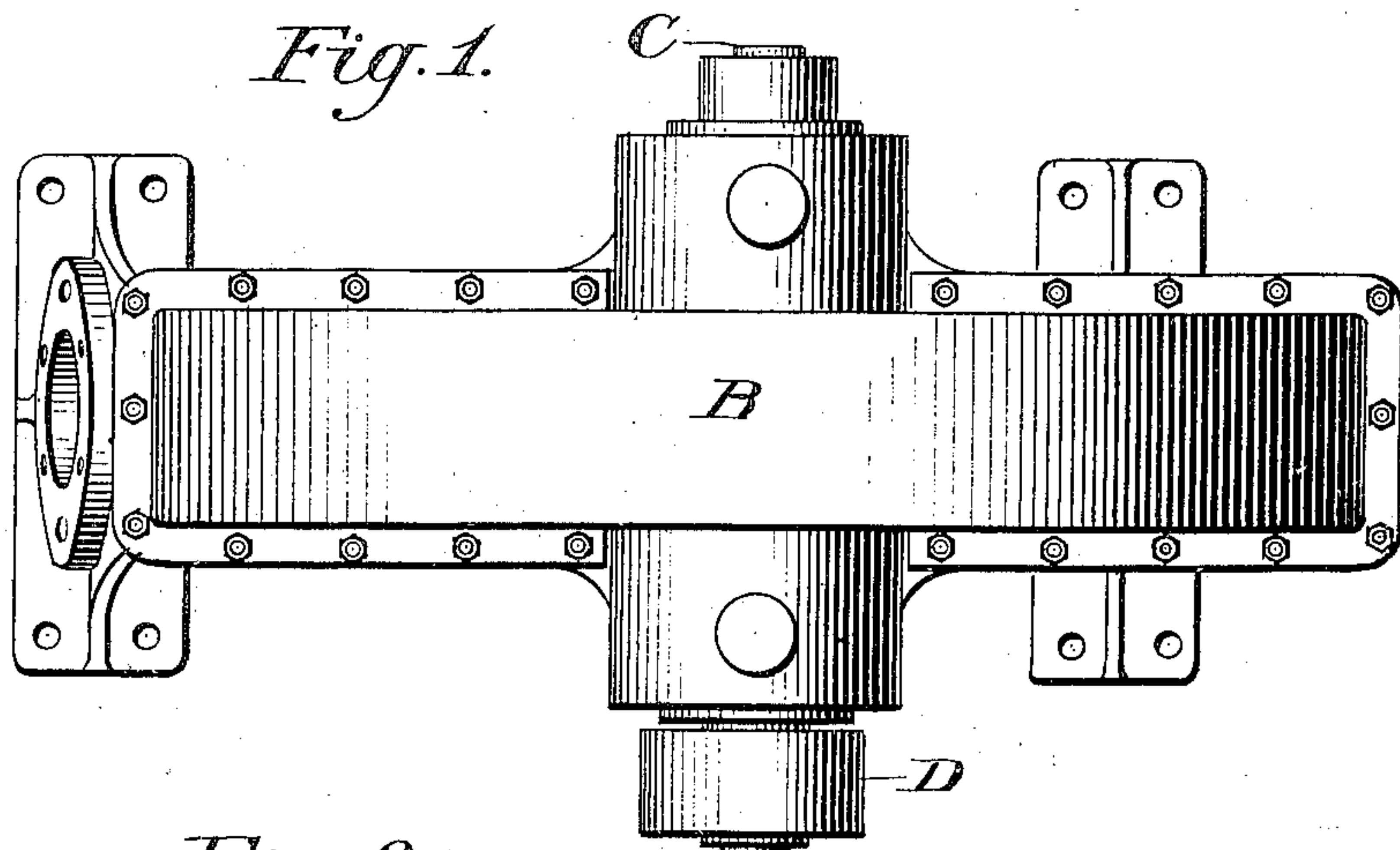
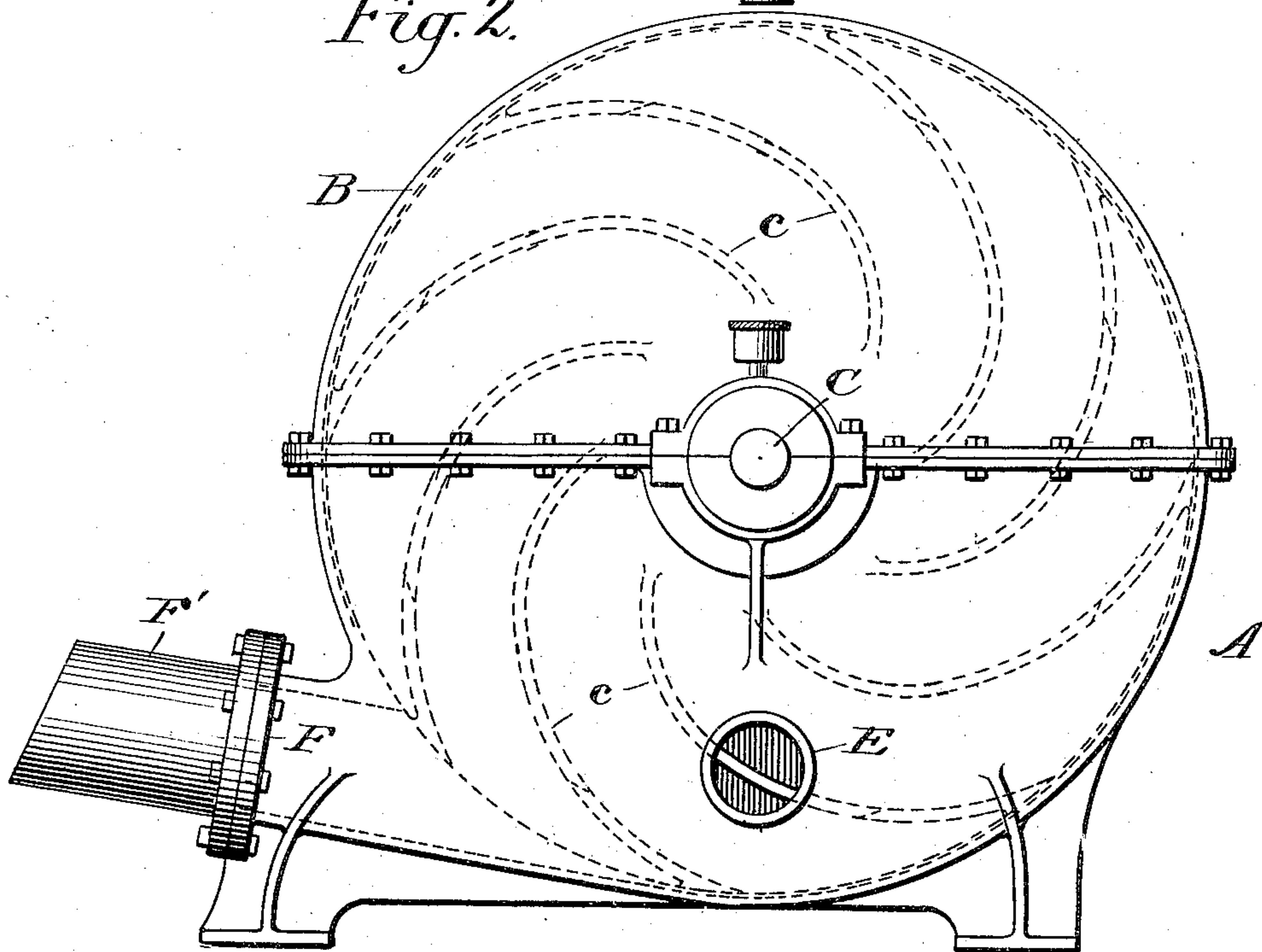


Fig. 2.



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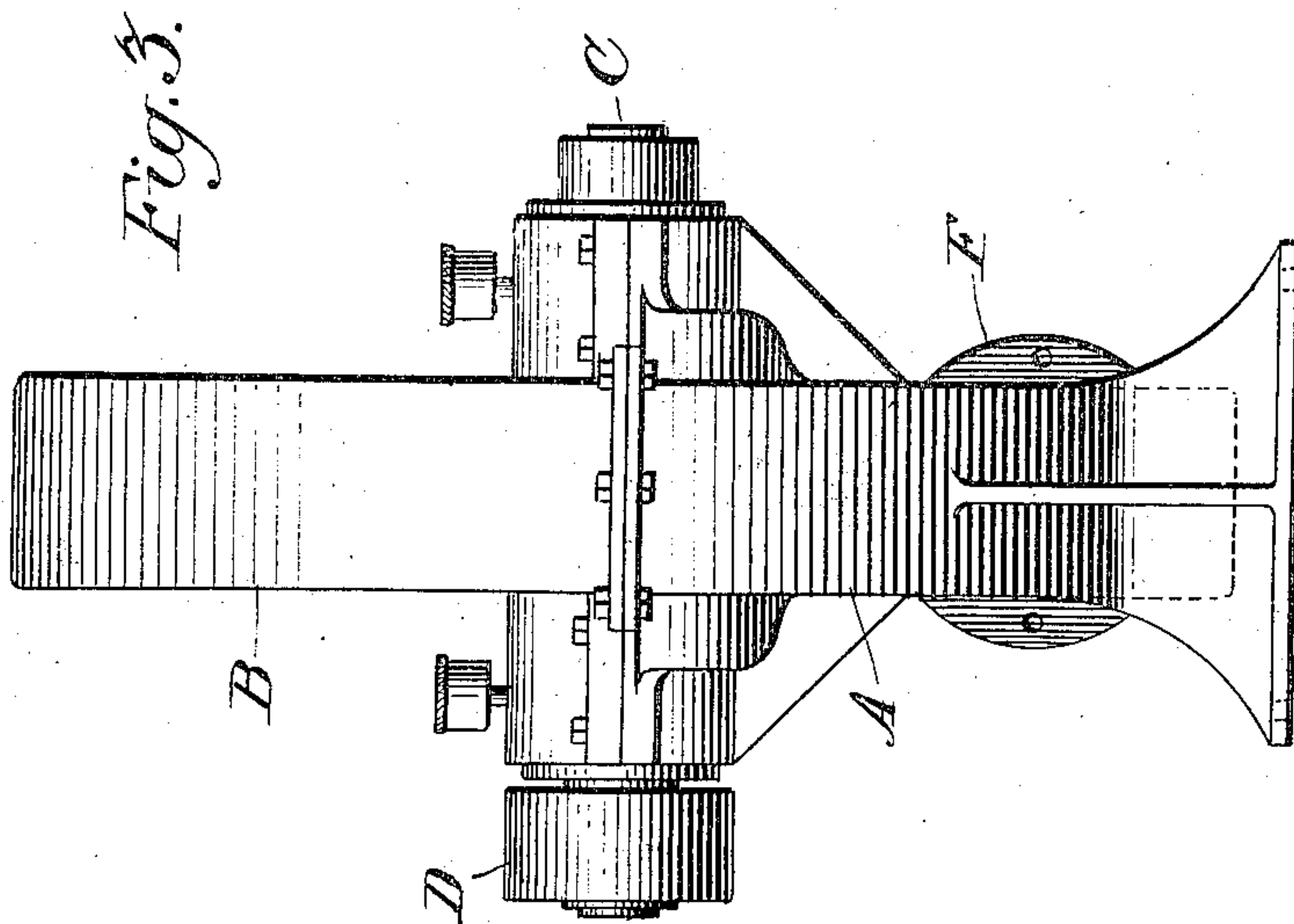
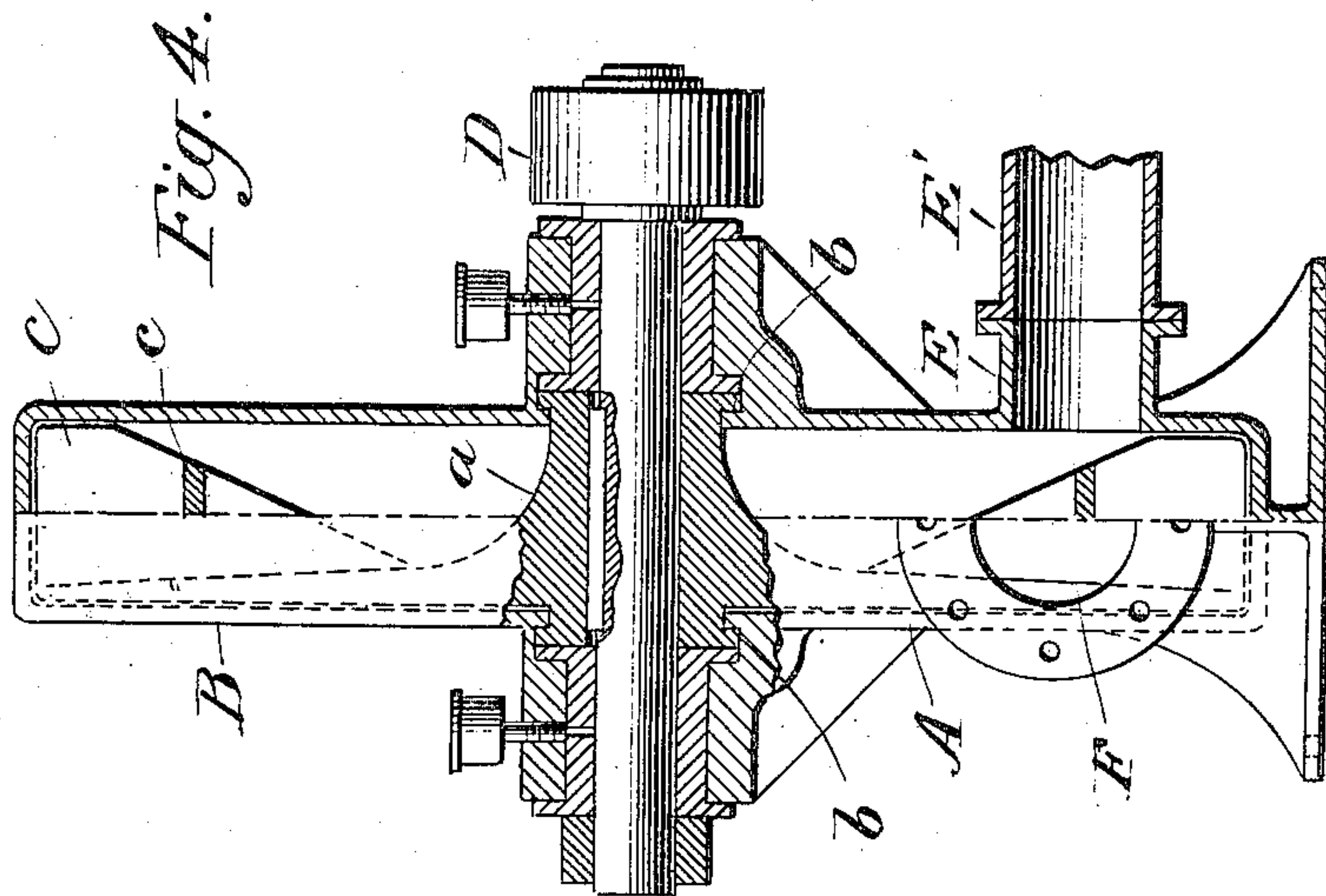
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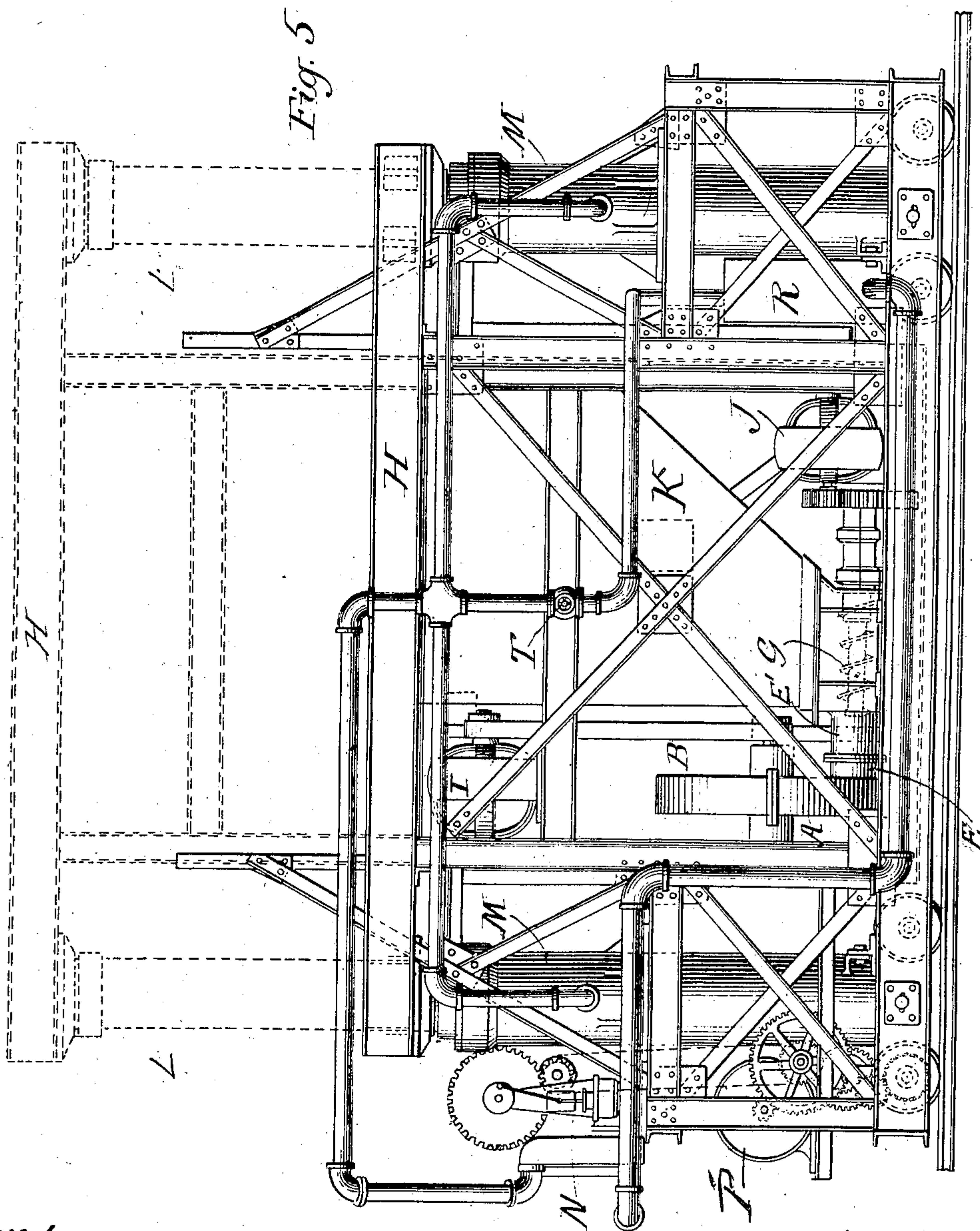
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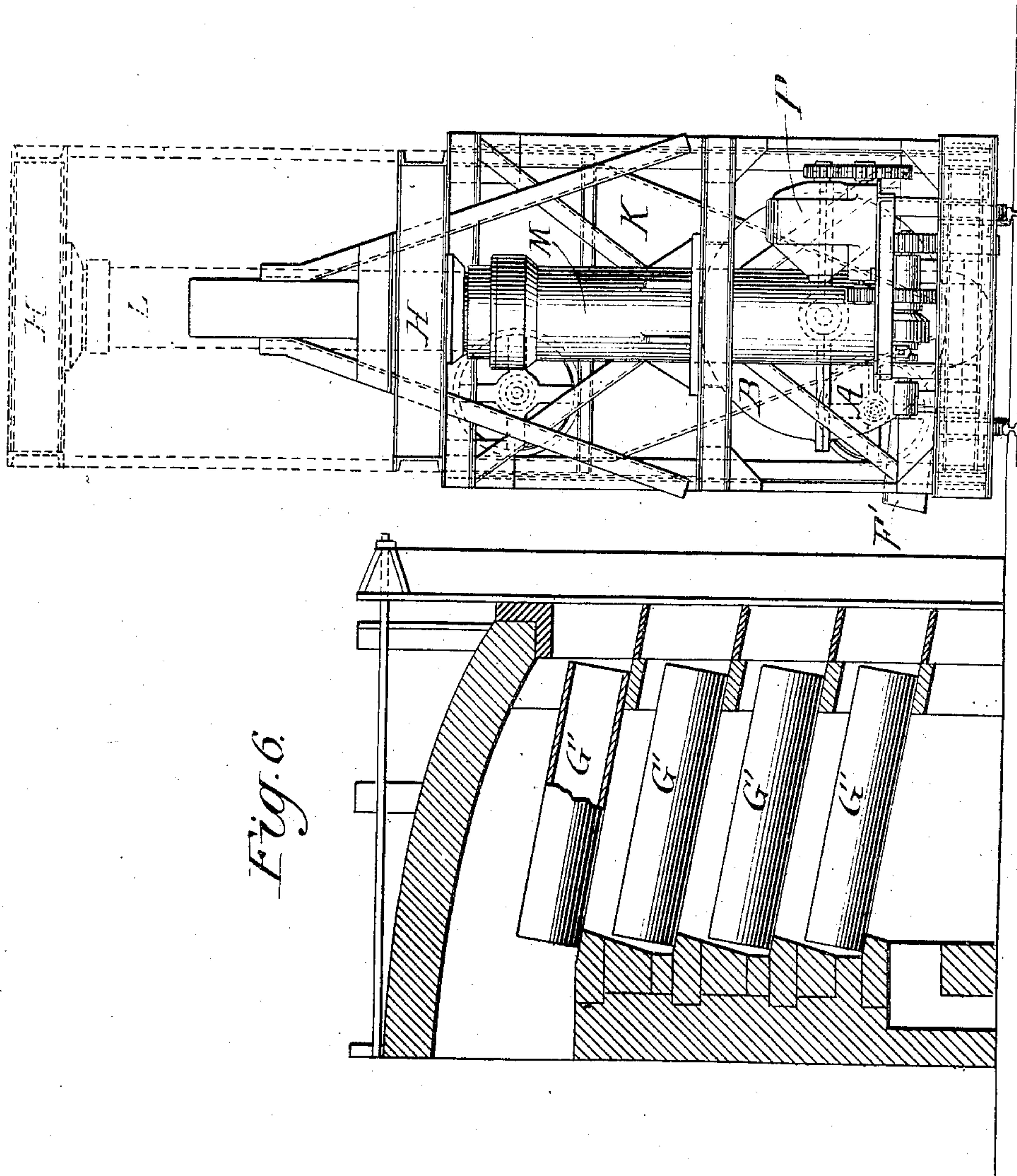
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5 SHEETS—SHEET 4.



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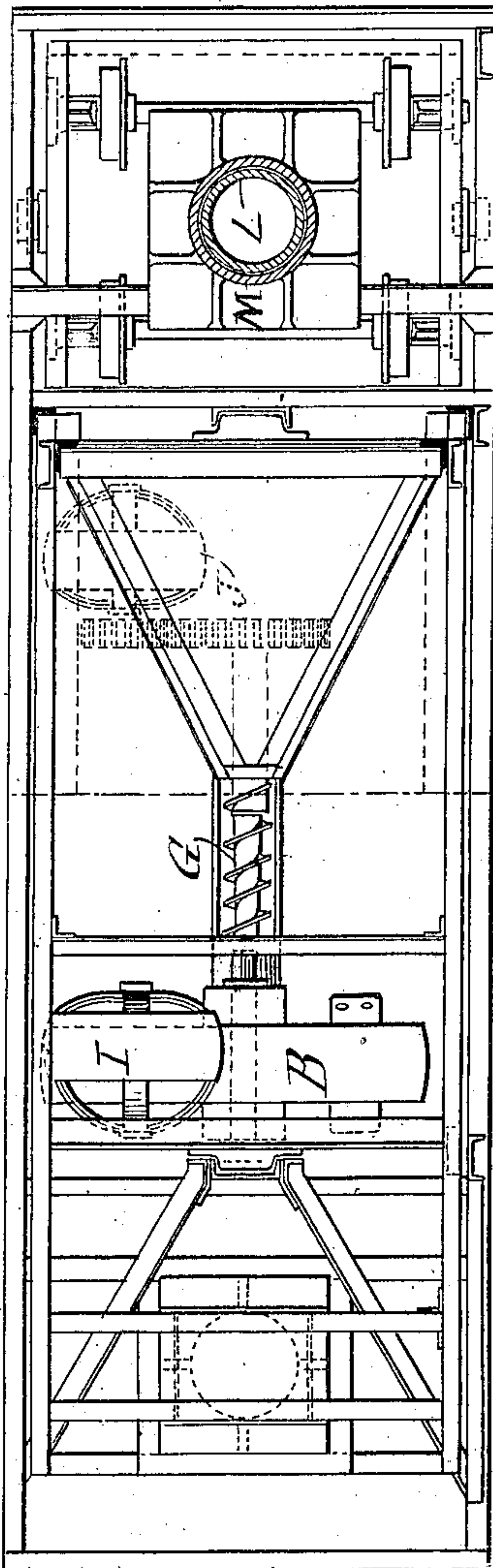
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5 SHEETS—SHEET 5.

Fig. 7.



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UNITED STATES PATENT OFFICE.

AUGUSTIN L. J. QUENEAU, OF SOUTH BETHLEHEM, PENNSYLVANIA.

APPARATUS FOR CHARGING RETORT-BENCHES.

No. 813,023.

Specification of Letters Patent.

Patented Feb. 20, 1906.

Application filed January 16, 1905. Serial No. 241,274.

To all whom it may concern:

Be it known that I, AUGUSTIN L. J. QUENEAU, a citizen of the Republic of France, residing at South Bethlehem, county of Northampton, State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Charging Retort-Benches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

In an application filed of even date herewith I have described and claimed a machine for charging or feeding retorts, muffles, or furnaces burning pulverized fuel, said machine having as its characteristic feature an organization of parts constructed and arranged to project or impel by impact the material to be charged in a continuous and substantially cylindrical undeviating stream directly into the retort or muffle or directly into the boiler-furnace, rotary kiln, or other furnace supplied.

My present invention contemplates means for rendering available a charging-machine of the kind described for charging a bench of retorts made up, as usual, of horizontal and vertical series thereof. In the adaptation of the charging-machine to this purpose I have mounted the machine upon a vertically-adjustable platform adapted to be raised and lowered preferably by means of hydraulic cylinders having as adjuncts a pump, a tank, and a connecting pipe system provided with suitable valves whereby the same body of water is adapted to be used over and over again to effect the raising and permit the lowering of the platform. I supply the charging-machine by means of a feed-screw located at the bottom of a hopper containing the ingredients to be charged, and I preferably (though not necessarily) locate the hopper upon the platform, so as to partake of its up-and-down movements. The hydraulic cylinders, the pump, the tank, and the motor for actuating the pump are located upon a main frame provided with traction-wheels adapted to run upon rails in front of the retort-bench, and the motors for driving the charging-machine and for actuating the feed-screw are mounted upon the adjustable platform.

In the accompanying drawings, Figures 1, 2, and 3 represent, respectively, a top plan view, side elevation, and rear elevation of a charging-machine of the type employed in

the practice of my invention. Fig. 4 represents a front elevation thereof, partly in section. Fig. 5 represents a front elevation of the entire apparatus employed for serving a bench of retorts, the uppermost adjustment of the pistons of the hydraulic cylinders and the platform carried thereby being indicated in dotted lines. Fig. 6 represents an end view of the apparatus shown in Fig. 5, illustrated as arranged in front of a bench of spelter-retorts. Fig. 7 represents a top plan view, partly in section and with certain of the parts removed.

The particular construction of the charging-machine proper is illustrated more specifically in Figs. 1, 2, 3, and 4. Referring to these figures, it will be noted that, as shown, the casing of the machine is made up of a base-casting A and a top casting B, said castings being provided with projecting flanges for bolting them together. Between the two castings is journaled the shaft C, adapted to be revolved by the drive-pulley D and provided with suitable brasses and lubricating devices. Upon the shaft C is keyed an impeller-disk consisting, preferably, of a single casting having a hub portion *a* with end flanges *b*, a flat main body portion constituting a circular plate of a diameter corresponding to the internal diameter of the casing, and a series of blades *c* of a curvature indicated in Fig. 2. At their outer ends these blades *c* are of a width corresponding to the width of the casing, and they continue of this width to a radial distance corresponding to the lower portion of the feed-inlet E, from which point they decrease in width until they merge into the surface of the disk. It will be apparent, therefore, that any material forced into the casing through the inlet-opening E will receive the full impact-blow of the extreme outer portion of the blade approaching at that particular instant and dropping in front of the widest and outermost portion of the blade and at right angles thereto will have imparted to it a momentum equivalent to that due to a sharp blow, in consequence whereof the material receiving such impact-blow will be driven out tangentially through the upwardly-inclined outlet-spout F and its auxiliary pipe-section F'. The function of the pipe-section F' (see Fig. 2) is to give form and direction to the issuing stream of charging material, and in this regard the pipe-section F' acts in a measure like the barrel of a

gun to insure against scattering of the projected particles. It will be noted that the feed-screw G (see Fig. 4) terminates, as indicated in dotted lines in said figure, well in advance of the discharge-mouth of the inlet into the casing, thereby leaving an intervening portion of the inlet, which portion is constantly filled with the material to be fed into the casing whether the feed-screw is in operation or not. This is a feature of very considerable importance in the practical carrying out of the invention, for the reason that the casing is thus sealed at all times against the admission of air with the material to be charged. Consequently the stream of material issuing from the casing through the tangential discharge-spout is substantially solid and maintains this formation without spreading on its way into the retorts. I am thus enabled to project into the retorts a continuous and homogeneous stream of the charging material of almost the cross-sectional area of the retorts themselves, and therefore to pack the retorts full from their extreme inner ends to their outer mouths. If any substantial body of air were present in the projected stream, such air would tend to expand immediately upon leaving the discharge-spout and would correspondingly scatter the material on the way to the retorts, and, furthermore, the effort of a stream containing any substantial body of air to enter a retort of diameter but little larger than the stream would be opposed by the air already in the retort to such a degree as to prevent successful charging where the material is in a comminuted condition. Where, as in my machine, the stream of material projected into the retort is substantially deprived of air by reason of the sealing of the inlet, the air within the retort is found to oppose no substantial resistance to the entrance of the material, and the charging operation proceeds with corresponding accuracy and completeness.

On reference to the remaining figures of the drawings, and particularly on reference to Fig. 6, it will be noted that the outlet-spout F' is arranged at the same angle as the retorts or muffles G' to be served, so that the issuing stream, pursuing a substantially straight trajectory, will enter directly into the relatively narrow retorts. The distance from which it is feasible to charge the retorts varies from three to ten feet and more, the stream retaining its substantially cylindrical shape without material deviation at these distances. In general, the conditions of use permit the apparatus to be approached to a distance of, say, three or four feet from the front of the bench, and for ordinary uses I prefer this arrangement.

As shown in Figs. 5, 6, and 7, the charging-machine is mounted upon a platform supported in hangers from an upper platform H

and is operated by an electric motor I, belted thereto, as indicated. Another motor J through suitable gearing operates the feed-screw G, arranged at the bottom of the hopper K, containing the zinciferous material and friable coal constituting the charge for the retorts or muffles. The motors I and J, the charging-machine, and preferably the hopper are all carried by the platform H, although the hopper may in some instances be supported by the main frame of the apparatus and be provided with a telescopic spout communicating with the small casing within which the feed-screw works. The platform H is supported by the hydraulic pistons L, L' of the hydraulic cylinders M. These cylinders are operated by a pump N, geared to an electric motor P, and a pipe system, as shown, extends from the pump to the cylinders and to a tank R, this pipe system being provided with a valve T for permitting the escape of the water into the tank when the pistons are lowered. By this expedient the same body of water can be utilized repeatedly for raising the pistons and permitting them to descend.

The mode of operation of the apparatus will be apparent. Beginning with the platform, and consequently the charging-machine in the upper adjustment, so as to bring the outlet-spout F' into line with the open mouth of the first one of the series of the upper retorts, the charging-machine is operated until that particular retort is properly charged, whereupon the remaining retorts of the upper row are successively charged in a like manner. Thereupon the platform, and consequently the charging-machine, is lowered to such a level that the next lowermost row of retorts may be successively charged, and so on until the whole bench of retorts has been supplied. At the termination of the charging of any individual retort the feed-screw is to be thrown out of operation until the charging-spout is brought up to the next retort to be charged, and this interruption of the action of the feed-screw may, as is evident, be effected either manually or automatically, as preferred. In some instances also I may substitute for the single outlet-spout F' a forked outlet-spout, so as to feed two or more retorts or muffles simultaneously.

It will be noted particularly that the charging-machine proper in my apparatus is adapted to be operated independently of the feed-screw or its equivalent. This capacity for the independent operation of the impeller-blades of the charging-machine and the feed-screw or its equivalent has several important functions. In the first place, the density of the stream issuing from the charging-machine may be determined by varying either the rate of revolution of the impeller-blades or the speed of the feed-screw, or both, thereby giving an extremely sensitive regulation for this

purpose. Furthermore, in passing from one retort to another, at which time it is desirable to interrupt the feed, so that the material may not be wasted, the continued independent revolution of the impeller-blades prevents the ingress of air into the interior of the charging-machine, preserving a relatively high vacuum therein, and therefore acts as a safeguard against the admixture of air with the material to any important degree in the casing when the feed of material is renewed. Furthermore, an important economy in energy is obtained by maintaining a constant revolution of the impeller-blades throughout the entire operation of charging the retort-bench, and the increase in speed which is incident to the interruption of the feed in passing from one retort to another is utilized at the beginning of the next charging operation to the best effect, inasmuch as the initial blows imparted to the entering material have a correspondingly greater driving or propelling effect.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. An apparatus for charging retorts, comprising a charging-machine having impact-blades, a delivery-spout, and a forced feed, and means for independently operating the

blades and forced feed; substantially as described.

2. An apparatus for charging a bench of retorts, comprising a charging-machine having impact-blades and a delivery-spout for impelling and directing the charge, a hopper, a feed-screw located at the bottom of the hopper and communicating with the inlet-opening of the charging-machine and means for operating the charging-machine independently of the feed-screw; substantially as described.

3. An apparatus for charging a bench of retorts, comprising a charging-machine having impact-blades and a delivery-spout for impelling and directing the charge, a hopper, and a feed-screw located at the bottom of the hopper and communicating with the inlet-opening of the charging-machine, means for operating the charging-machine independently of the feed-screw a platform carrying the charging-machine, feed-screw and hopper, and hydraulic cylinders for raising and lowering the platform; substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

AUGUSTIN L. J. QUENEAU.

Witnesses:

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