

No. 702,040.

Patented June 10, 1902.

B. C. TILGHMAN, JR.
SAND BLAST TUMBLING BARREL.

(Application filed Sept. 25, 1901.)

(No Model.)

FIG. 1.

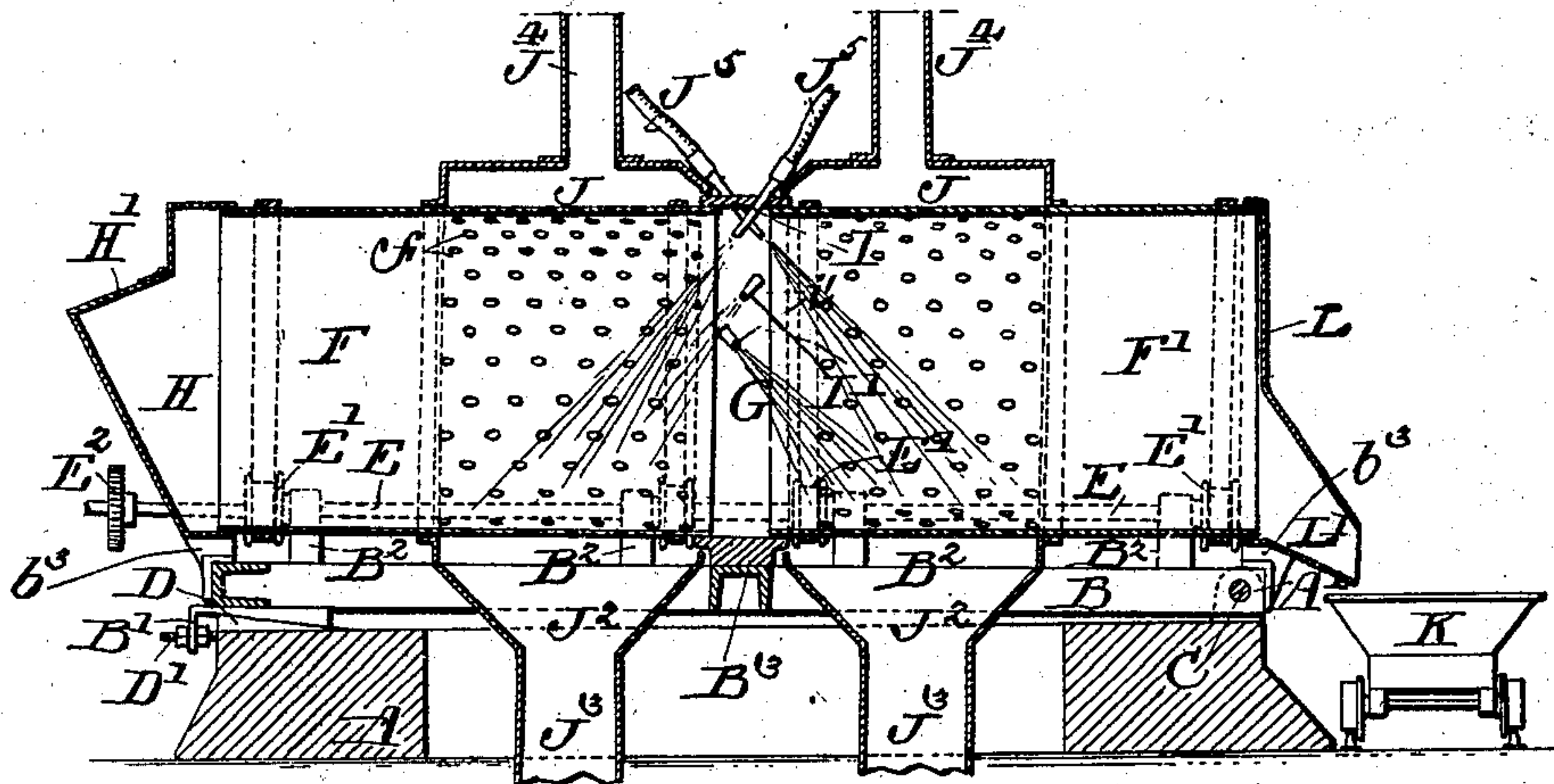


FIG. 2.

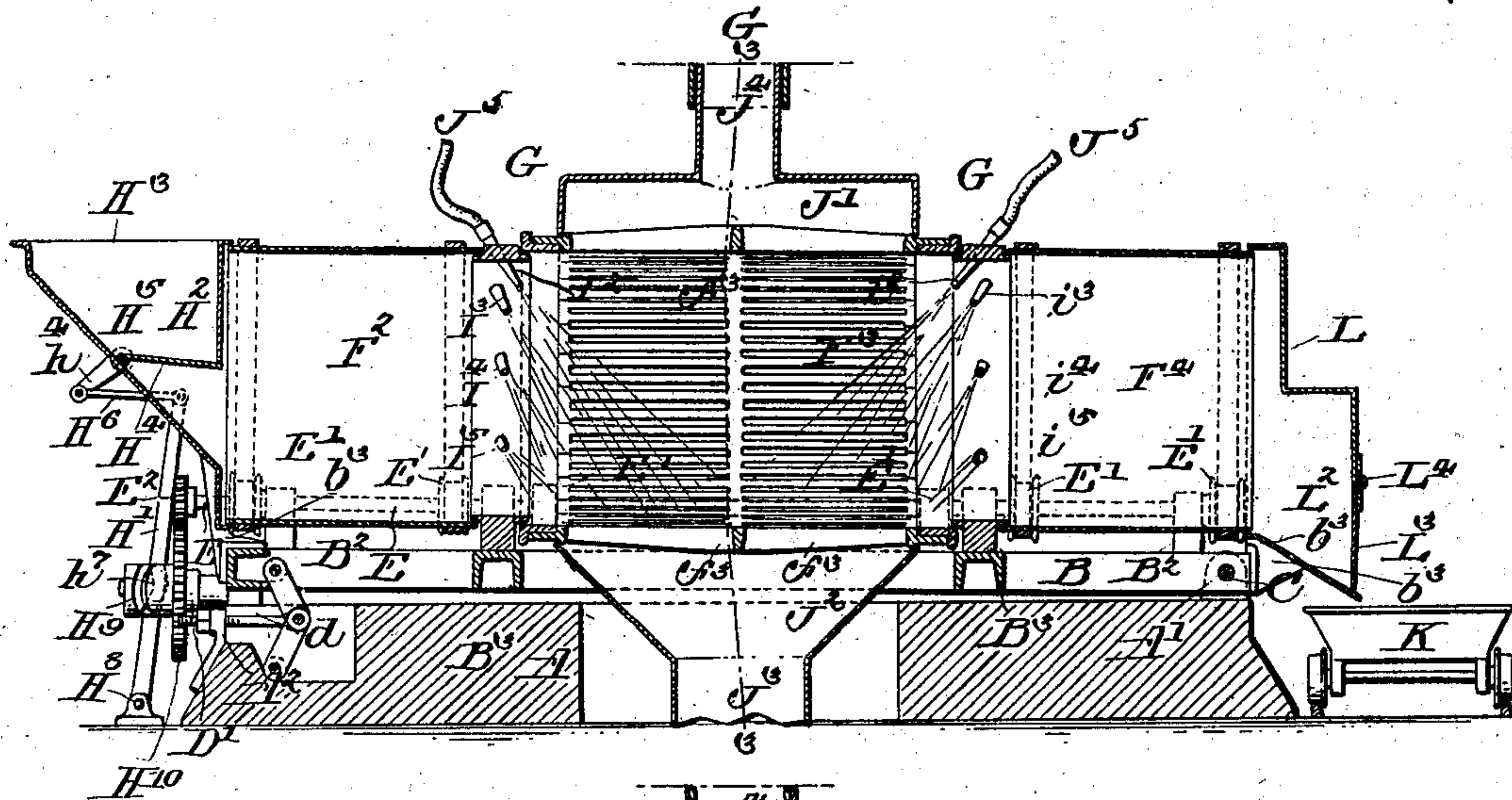
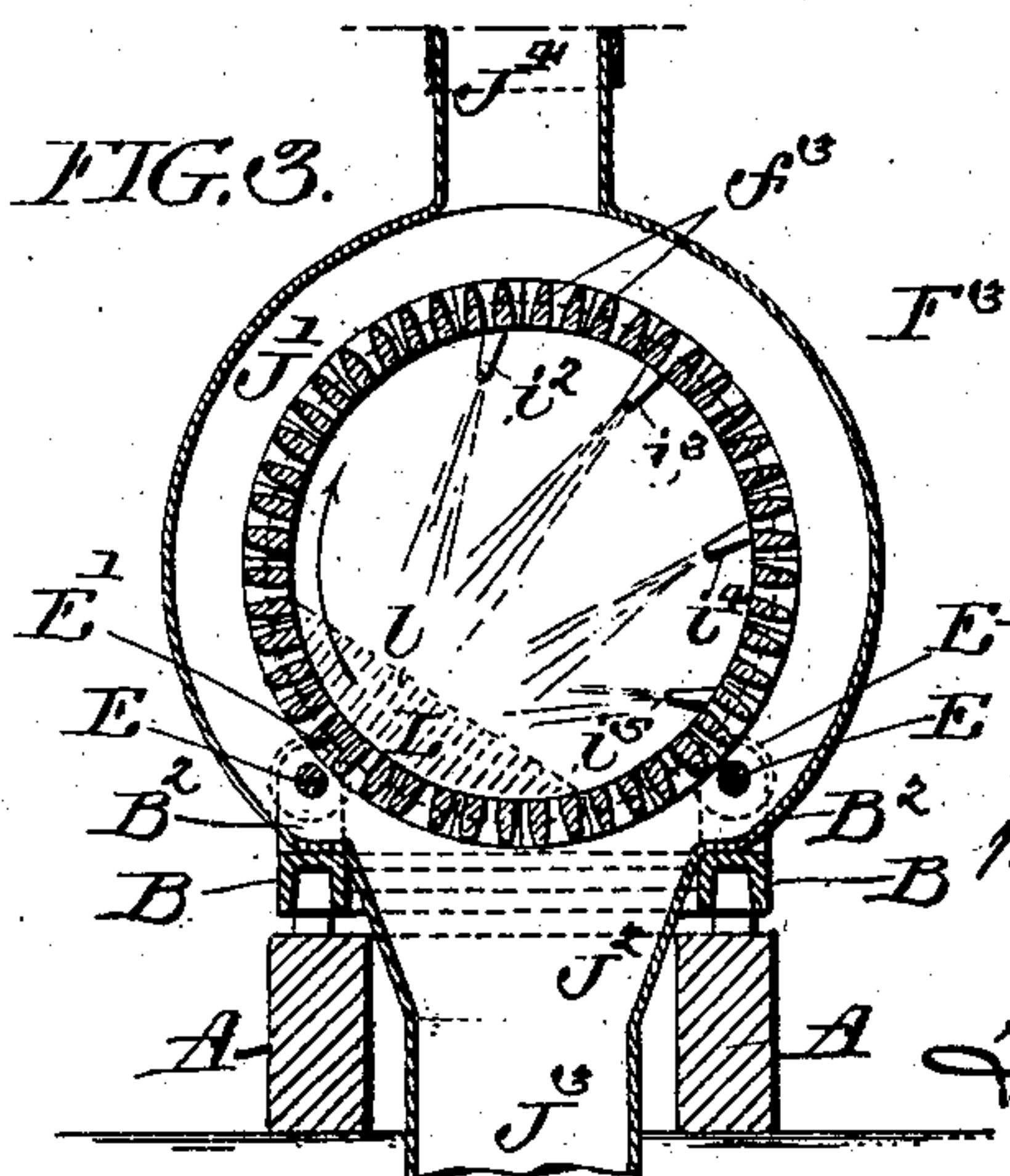


FIG. 3.



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BENJAMIN C. TILGHMAN, JR., OF PHILADELPHIA, PENNSYLVANIA.

SAND-BLAST TUMBLING-BARREL.

SPECIFICATION forming part of Letters Patent No. 702,040, dated June 10, 1902.

Application filed September 25, 1901. Serial No. 76,459. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN C. TILGHMAN, Jr., a citizen of the United States of America, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Sand-Blast Tumbling-Barrels, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to sand-blast tumbling-barrels, and has for its object to provide a device of this kind of increased efficiency and convenience of operation.

Among the leading features of my construction are, first, the use in combination with a barrel of two or more sand-blast nozzles supported outside of the barrel and directed at varying angles into the interior of the barrel. Second and most important is the construction of the barrel in two or more sections, preferably all revolving at equal speed and having sand-blast nozzles supported so as to direct the blast into the barrels through the space intervening between adjacent sections. By preference also I construct my sectional barrels with annular stationary rings intervening between the adjacent ends of the barrels, utilizing said rings as a support for the nozzles, which should be set at varying angles to avoid interference of the different jets and distribute them longitudinally over the work in the barrel.

Other features of improvement will be pointed out in connection with the drawings which illustrate my invention, and in which—

Figure 1 is a longitudinal section elevation of a tumbling-barrel construction involving my invention, consisting in this case of two sections. Fig. 2 is a similar sectional elevation of a construction involving the use of three barrel-sections, and Fig. 3 is a cross-sectional view on the line 3 3 of Fig. 2.

A indicates the fixed support upon which the structure rests. As shown, this support is provided with upwardly-extending lugs A' at its rear end, supporting a pivot-shaft, (indicated at C.)

B B are the supports upon which the tumbling-barrels rest, (shown as angle-irons,) said supports being pivoted on the shaft C at their rear ends. In the construction shown

in Fig. 1 the supporting-irons B have attached to their front ends downwardly-projecting perforated irons, (indicated at B',) through which extends adjusting-screw D', by shifting the nuts upon which a wedge D is adjusted between the front ends of the irons B and the support A, thus changing the angular adjustments of the supporting-irons and the structure resting upon them. In Fig. 2 the adjusting-screw D' passes through a perforated brace A², secured to the base, and acts upon a toggle-joint (indicated at d) and having the same function of adjusting the position of the angular irons B.

B² B², &c., are bearings supported on the irons B and supporting the longitudinal shafts E.

B³ B³ are supports extending from the irons B and serving to sustain in position the nozzle-supporting device. These supports also support conveniently a bearing or bearings for the shaft E, which serve to support and rotate the tumbling-barrel, and, as shown, the shafts have also secured to their front ends gear-wheels E², by means of which and any convenient train of gears they can be actuated. In Fig. 2 the gear-wheel E² also serves to communicate motion to a gear-wheel H¹⁰, which rotates a cam (indicated at H⁹) and serving a purpose to be hereinafter explained.

F and F', Fig. 1, indicate two sections of the tumbling-barrel, here shown as made up of perforated metal plates, f indicating the perforations.

In Fig. 2 three sections of the tumbling-barrel are indicated at F² F³ F⁴, the sections F² and F⁴ being shown as non-perforated and the section F³ made up of grate-like bars secured to annular rings at their ends. The grate-bars are indicated at f³.

G G indicate stationary annular rings intervening between adjacent sections of the tumbling-barrel. These rings, as before stated, are secured to the supports B³, and they serve as supports for the sand-blast nozzles, which in Fig. 1 are indicated at I and I' as directed into the barrel-section F and at i and i' into the barrel-section F'. In Fig. 2 the nozzles are shown as secured to the front ring G at I² I³ I⁴ I⁵, while similar nozzles secured to the rear ring G are shown at i² i³ i⁴ i⁵, and it will be clear from the showing in Figs. 2 and 3

that these nozzles are set at varying angles, so that the jets thrown by them will not interfere with each other and the sand-blast will be well distributed over the work in the barrel, such work being indicated at L, Fig. 3, *l* indicating the surface, the barrel revolving in the direction of the hands of a watch, as shown by the hour.

*J*⁵ *J*⁵ indicate feed-pipes leading to the nozzle.

H, Fig. 1, indicates a work-receiving hopper at the front end of the barrel, *H'* indicating the position of the opening for charging. In Fig. 2 a somewhat different receiving-hopper is indicated at *H*², the opening being shown at *H*³, *H*⁴ indicating a movable bottom to the hopper secured on a pivoted shaft *H*⁵, having also secured to it a lever-arm *h*⁴, which by a connecting-rod *H*⁶ is secured to the upper free end of a lever *H*⁷, pivoted at *H*⁸ and having a cam-roller *h*⁷ running in the cam *H*⁹.

L, Figs. 1 and 2, indicates a stationary shield at the end of the tumbling-barrel. In Fig. 1 this is shown with a delivering-spout *L'* and in Fig. 2 with a receiving-section *L*², having a door *L*³, pivoted at *L*⁴, by which the contents can be discharged at will.

K indicates a car for receiving the finished work.

J J, Fig. 1, indicate casings surrounding perforated portions of the barrels *F* and *F'* and communicating through hopper-bottoms *J*² with space *J*³ and through pipes *J*⁴ with a suction-fan. (Not shown.) In Fig. 2 a similar casing is indicated at *J'* with connections similar to those of the casings *J J*.

In operation the barrels are rotated by the action of the supporting-wheels *E'*, driven by the shafts *E*. The material to be treated is fed into the front end of the barrel, and its speed of passage through the barrel will depend upon the speed of rotation and somewhat upon the angular inclination of the barrel and somewhat also upon the rapidity with which the material is fed to the barrel. It is quite important for the best results that the material should be fed to the barrel at a regular rate and preferably a rate which bears a definite ratio to the rotation of the barrel. In the construction shown in Fig. 2 I have provided for the intermittent dumping of material charged into the receptacle *H*² by the movements of the bottom *H*⁴, which through the mechanism described is actuated in a definite ratio to the rotations of the barrel. The material is fed through the first section, in which it may or may not be acted upon by the blast, and thence to the succeeding sections of the tumbling-barrel, and the blast is preferably introduced as shown in the space between adjacent barrel ends and preferably through the stationary rings *G*, which form a part of the barrel-conduit. The material of course is delivered to the rear end

of the barrel either constantly or intermittently if a closed receptacle, such as *L*², is used.

The sand and dirt which escape through the perforations in the barrel are collected in the chambers *J*, the heavier particles passing over through the spouts *J*³ and the lighter particles being drawn over through the conduits *J*⁴.

My sectional barrel is especially important and valuable for the treatment of long and narrow devices, such as pipe-sections, but the sectional arrangement is also desirable for all purposes, especially where it is desirable to pass a large quantity of work rapidly under the sand-blast.

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

1. In combination with a tumbling-barrel, a support for sand-blast nozzles situated outside of the barrel and two or more blast-nozzles secured to said support outside of the periphery of the barrel and directed at varying angles into the barrel.

2. In combination with a sectional tumbling barrel, means for revolving each section, sand-blast-nozzle supports situated between one or more of the sections of the barrel and blast-nozzles secured to said supports and directed into the barrel.

3. In combination with a sectional tumbling-barrel, means for revolving each section, sand-blast-nozzle supports situated between one or more of the sections of the barrel and blast-nozzles secured to said supports and directed at varying angles into the barrel.

4. In combination with a sectional tumbling-barrel, means for revolving each section, annular stationary rings situated between the barrel-sections and blast-nozzles secured to said rings and directed into the barrel.

5. A sectional tumbling-barrel having three sections, means for revolving said barrel-sections, supports for sand-blast nozzles, situated between two adjacent sections and blast-nozzles secured to said supports and directed into the barrel.

6. A sectional tumbling-barrel having three sections, means for revolving said barrel-sections and sand-blast nozzles directed to act on the inside of the central barrel-section.

7. A sectional tumbling-barrel made up of two or more sections set in line in combination with means for revolving one or more of the barrel-sections and sand-blast nozzles directed into one or more of the revolving barrel-sections.

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Witnesses:

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