

(No Model.)

2 Sheets—Sheet 1.

H. L. GRAHAM.
SANDER.

No. 601,095.

Patented Mar. 22, 1898.

FIG. 1.

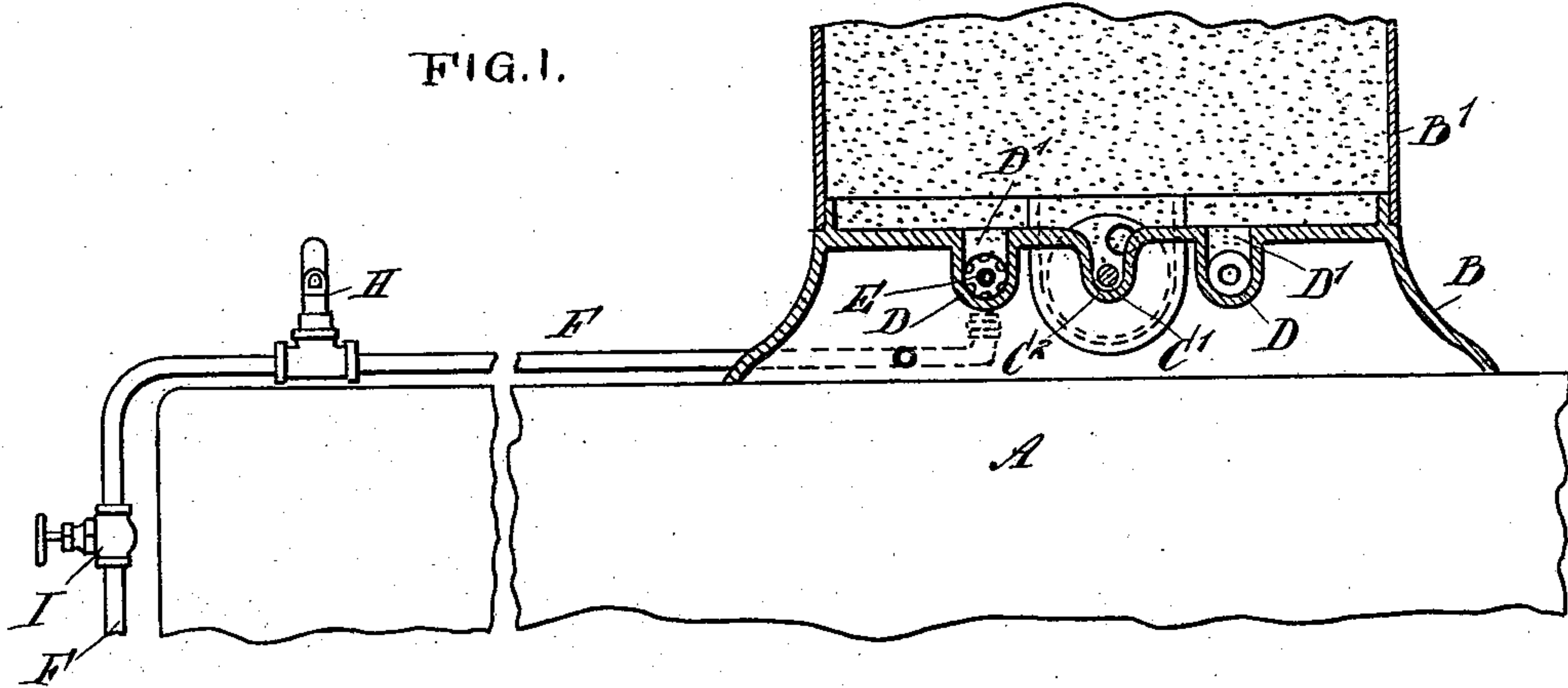


FIG. 2.

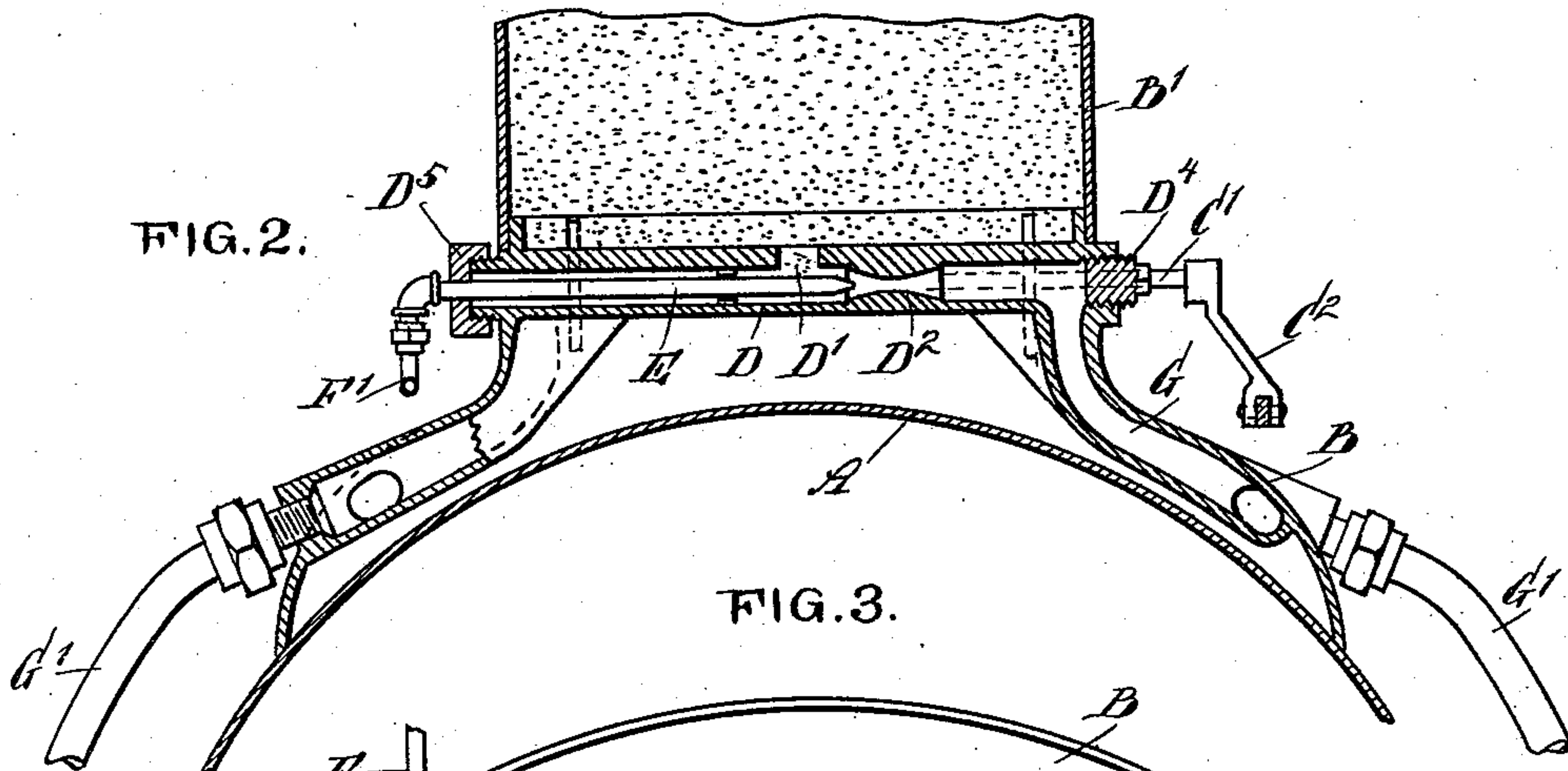
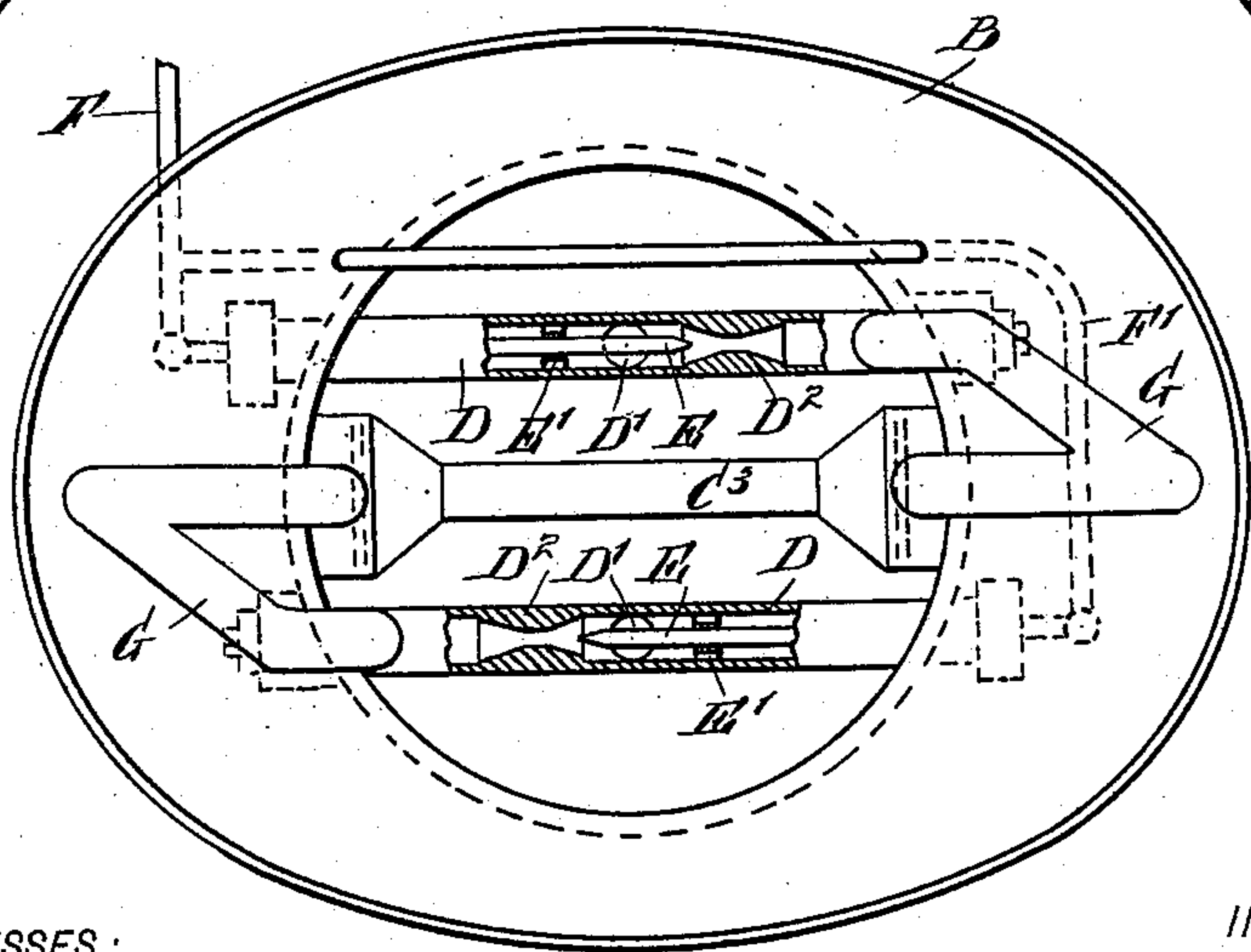


FIG. 3.



WITNESSES:

Donn Twitchell
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FIG. 4.



INVENTOR

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ATTORNEYS.

UNITED STATES PATENT OFFICE.

HERBERT LINCOLN GRAHAM, OF AUGUSTA, GEORGIA.

SANDER.

SPECIFICATION forming part of Letters Patent No. 601,095, dated March 22, 1898.

Application filed June 16, 1897. Serial No. 640,996. (No model.)

To all whom it may concern:

Be it known that I, HERBERT LINCOLN GRAHAM, of Augusta, in the county of Richmond and State of Georgia, have invented a new and
5 Improved Sander, of which the following is a full, clear, and exact description.

My invention relates to an improvement in sanders adapted particularly to be used in connection with railway-locomotives. Its ob-
10 ject is to provide a sanding device which will be certain in its operation and will feed the sand rapidly or slowly, as may be desired by the engineer, and which is also not liable to become clogged or refuse to work.

15 Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a partial side elevation of a lo-
20 comotive-boiler and with a sand-box mounted thereon, the sand-box being in section. Fig. 2 is a cross-section taken through the top of the boiler and lower portion of the sand-box. Fig. 3 is a bottom plan view of a sand-box
25 stand. Fig. 4 is an end view of the guiding device which holds the air-jet centrally within its surrounding tube. Fig. 5 is a cross-sectional elevation of my device, showing a construction which varies slightly in some
30 parts from the construction shown in the preceding views. Fig. 6 is a bottom plan, partially in section; and Fig. 7 is a partial longitudinal section of a modified construction of my device.

35 My invention relates to an improved mechanism for delivering sand from the sand-box of a locomotive to the rails; and it consists of certain improved constructions, which will be hereinafter described and particularly
40 pointed out.

In the drawings, A represents a portion of the boiler upon which the sand-box is mounted, and B the base, supported by the boiler and carrying the sand-box B'. Beneath the
45 sand-box are placed two tubes D, which may be made, as shown in Figs. 1 and 2, as a part of the stand B, or, as shown in Fig. 5, entirely separate from the stand. These tubes are preferably straight and extend entirely
50 through the base. At one end they are provided with a cap D⁵ or other suitable closure and at the other end with a plug D⁴. The

caps and plugs may be removed, leaving a free passage through the entire length of the tubes, so that they may be readily cleaned
55 out if from any cause they become clogged. The tubes D are connected by passages D' with the interior of the sand-box. This connection should be of such a form that the sand will be delivered by gravity to the interior of
60 the tubes D.

Passing through the cap D⁵ is a small tube or pipe E, which has its nozzle projecting slightly beyond the passage D' and contracted
65 so that the opening is of less area than the bore of the pipe. This contraction of the jet is preferably but not absolutely necessary. The portion of the tube D immediately beyond the jet is also preferably contracted, as
70 shown at D². Where the pipe D is made from ordinary tubing, this contraction may be obtained by inserting a casting, as shown in Fig. 5. Where the tube is formed in a cast-
75 ing, the contracted portion may be formed integral with the tube, as shown in Figs. 2 and 3. The two tubes D are similarly provided with jet-pipes E, but said jet-pipes are ar-
ranged to point in opposite directions. One of these pipes supplies the sand for one rail
80 and the other for the other rail. The pipe E is connected by a pipe F' with a pipe F, which leads to the cab of the engineer, and is provided at a point within sight and hearing of
85 the engineer with a whistle H, which is constantly connected with the pipe and will blow whenever air under pressure is within the pipe. This pipe F is provided beyond the
90 whistle with an operating-valve I, located so as to be convenient to the engineer. At the end D² of the tube D, opposite the entrance of the blast-pipe E, is connected a pipe or
95 passage G, which communicates with a pipe G', leading to the track-rail.

The pipe F is connected with the air-reser-
voir upon the locomotive. If the valve I be
95 open, air will be admitted through the pipe F to the nozzles of the blast-pipes E and will force the sand lying in the tube D through the contracted portion D² of the tube and propel the same into the pipe G and thus through
100 the pipe G' to the rail. As soon as the air is admitted the whistle H will begin to blow and will continue blowing as long as the air is turned on. This will call the attention of the

engineer to the fact that sand is being applied and will prevent his forgetting that fact and allowing the sand to waste. Being constantly warned that the sand is being applied, he will shut it off as soon as its use is not needed. In consequence there will be a considerable economy in the use of the sand, and such a contingency as being without sand will be prevented. The amount of sand delivered to the rail will depend upon the amount of air used. The greater the force of the blast the greater amount of sand will be carried over to the delivery-pipe G', and the whistle will indicate this by its volume of sound. The greater the amount of air being used the greater the pressure in the pipe F and consequently the louder the tone of the whistle. The engineer will thus be enabled to gage the amount of sand used to the necessity of the case, which will result in a further saving of the sand.

My device does not prevent using the ordinary feeding device, which is shown in the drawings, (see Fig. 5,) and consists of a shaft C', passing through a cavity C², formed in the bottom of the base B, and said shaft having disks C³ mounted thereon, provided with openings C⁴, adapted to register with one end of a sand passage or tube C. The shaft C' is provided with a crank C⁵ upon one end, which may be connected with any suitable device so as to be operated by the engineer. This ordinary sand-feeding device may be left upon the sand-box, if desired, so that it may be used in case anything should prevent using my improved air-feeding device.

It is desirable that the end of the tube D which receives the sand-blast should be closed by a removable plug D⁴, in order that the part which is liable to wear may be readily removed and replaced. In Fig. 5 the right-hand end of the tube D is shown as provided with a sleeve D³, which connects said tube with the pipe G, and the plug D⁴ is inserted in the outer end of the sleeve D³.

In case the feeding-opening B' in the dome of the sand-box should become clogged it is a very simple matter to remove the plug D⁴ and insert a hose therein which has been connected with the air-supply. As the air is turned on it will blow out any obstruction, and in use when the cap D⁵ is in place it will force air upward through the sand in the box B and thoroughly stir the same, thus preventing any possibility of caking. A device

E' is attached to the inner portion of the blast-pipe E. This serves to hold the pipe centrally in its tube. The tube E may be readily removed by taking off the cap D⁵, and when this is done and the plug D⁴ removed it leaves a straight passage entirely through the sand-box base, so that it may be readily cleaned if clogged. It is evident that any form of vapor may be used to operate my device. It will in practice, however, be operated by air.

A still simpler form of construction is shown in Figs. 6 and 7. In this a single pipe *d* is provided, extending across the base B beneath the sand-box B'. The pipe *d* is connected at the middle of its length with the sand-box by an opening *d'* and by a horizontal pipe L with the compressed-air supply. Within the pipe L, which extends lengthwise the boiler, is a pipe *e*, connected to the pipe F, leading from the cab and carrying the air-supply. The inner end of the pipe *e* is closed and terminates beneath the connection *d'* to the sand-box. The pipe *e* is provided with two small holes *e'*, located in its side and facing the opposite ends of the discharge-pipe *d*. The ends of the pipe *d* are connected with a pipe C⁶, as shown in Fig. 6. By this construction the device is much simplified without impairing its efficiency. The air-blast when admitted through the pipe F discharges through the opposite holes *e'*, throwing the sand in both directions. It may also be readily applied to any sand-box now in place without changing the ordinary hand-feeding mechanism.

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

A pneumatic sander for locomotives comprising a straight pipe located beneath the sand-box and extending across the same, a connection from the said pipe upward to the sand-box, whereby the sand is fed to the nozzle by gravity, a conveying-pipe leading from one end of the nozzle-pipe, and an air-blast pipe entering the other end and terminating in a nozzle just beyond the connection to the sand-box, and removable ends to said pipe, whereby it may be readily cleaned.

HERBERT LINCOLN GRAHAM.

Witnesses:

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