No. 760,772. PATENTED MAY 24, 1904.

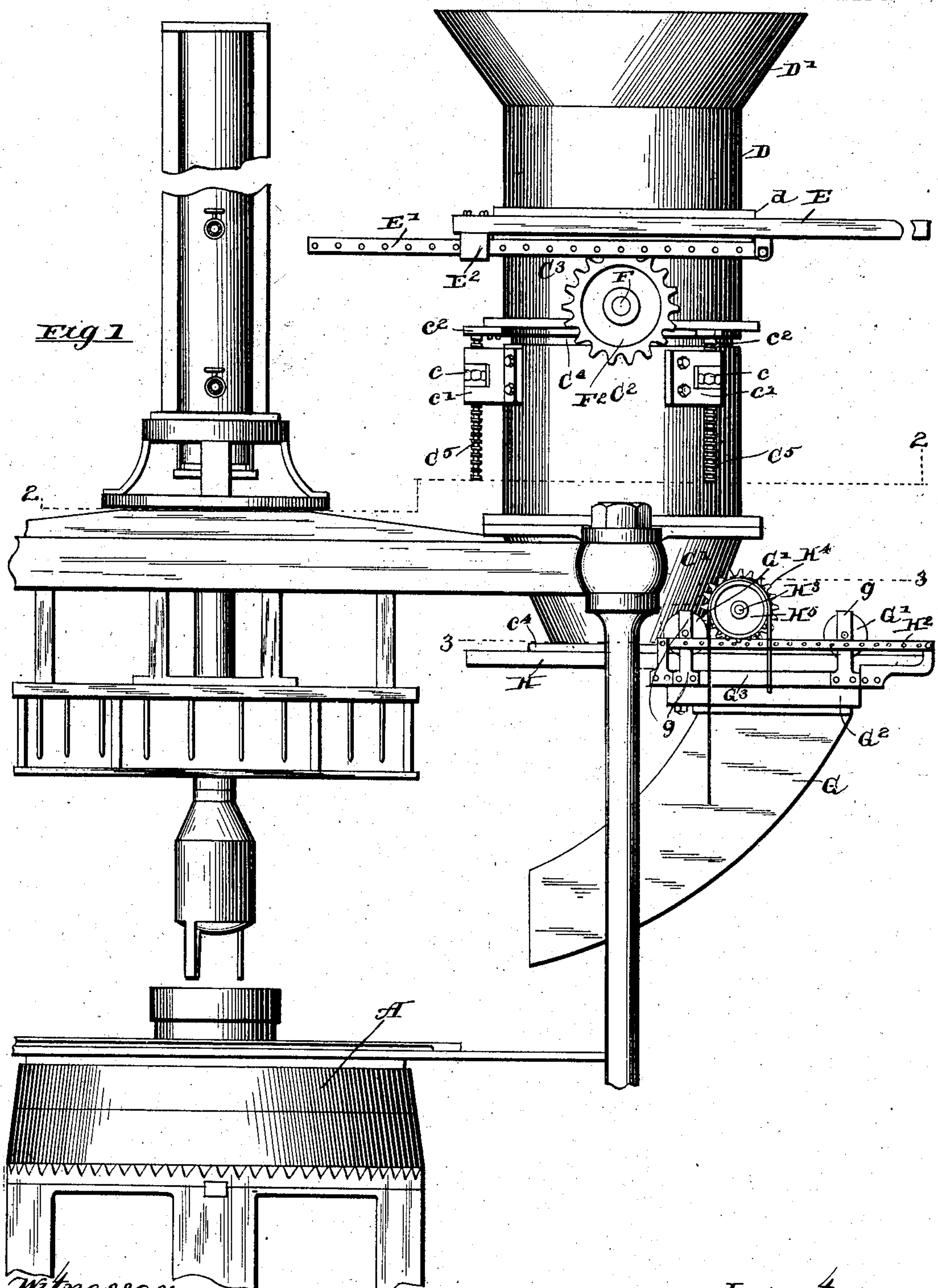
A. L. & O. ANDERSON.

APPARATUS FOR SUPPLYING GRANULAR MATERIAL.

APPLICATION FILED MAY 17, 1902.

NO MODEL. 5 SHEETS—SHEET 1.

Fig 1



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 5 SHEETS—SHEET 2.

Fig 2.

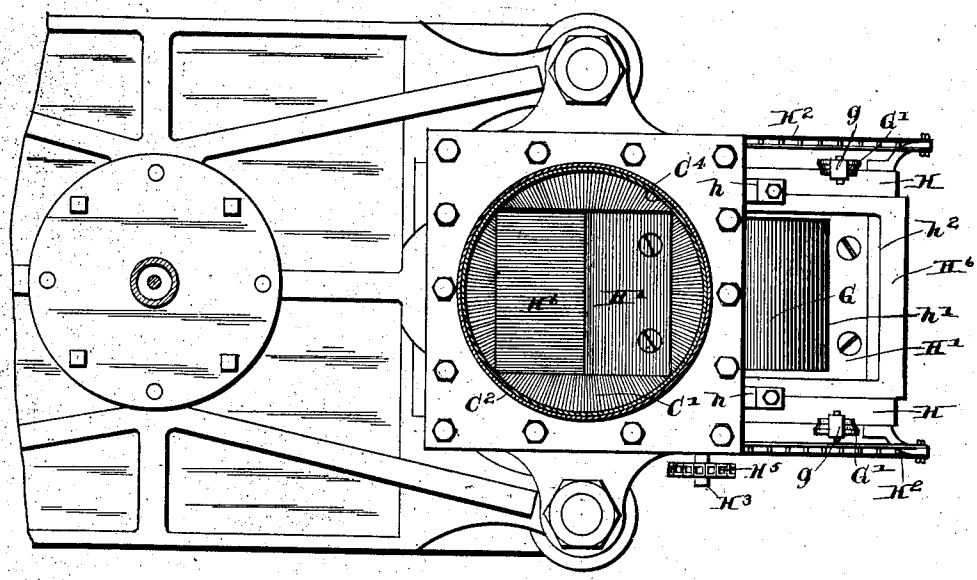
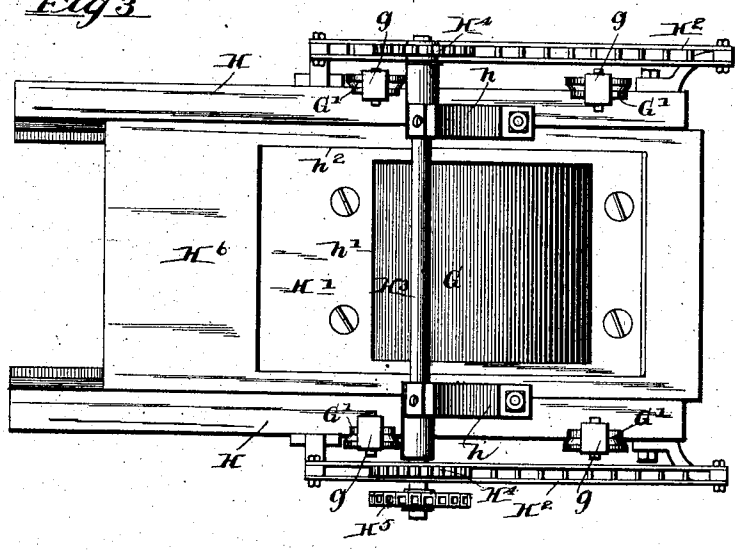


Fig 3.



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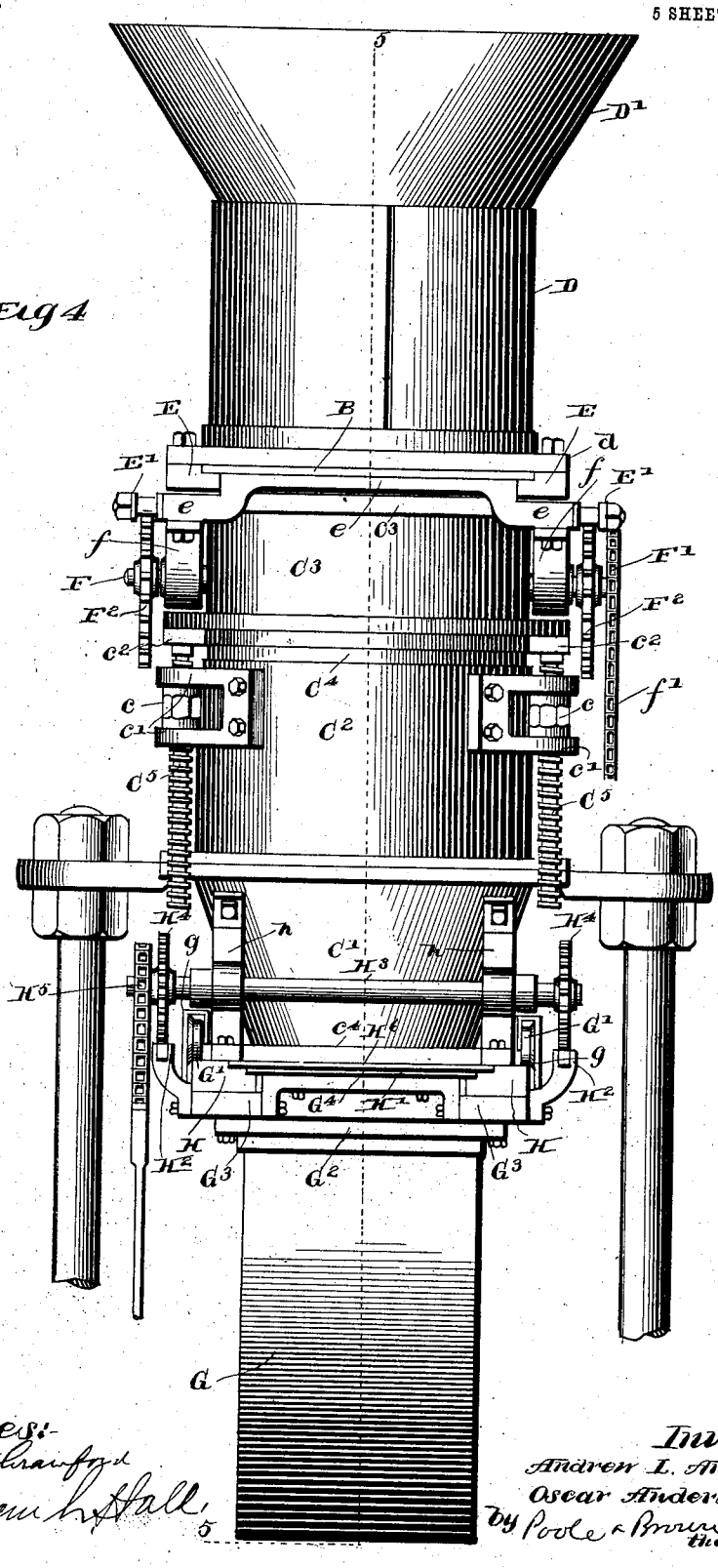
A. L. & O. ANDERSON.

APPARATUS FOR SUPPLYING GRANULAR MATERIAL.

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NO MODEL. 5 SHEETS—SHEET 3.

Fig 4



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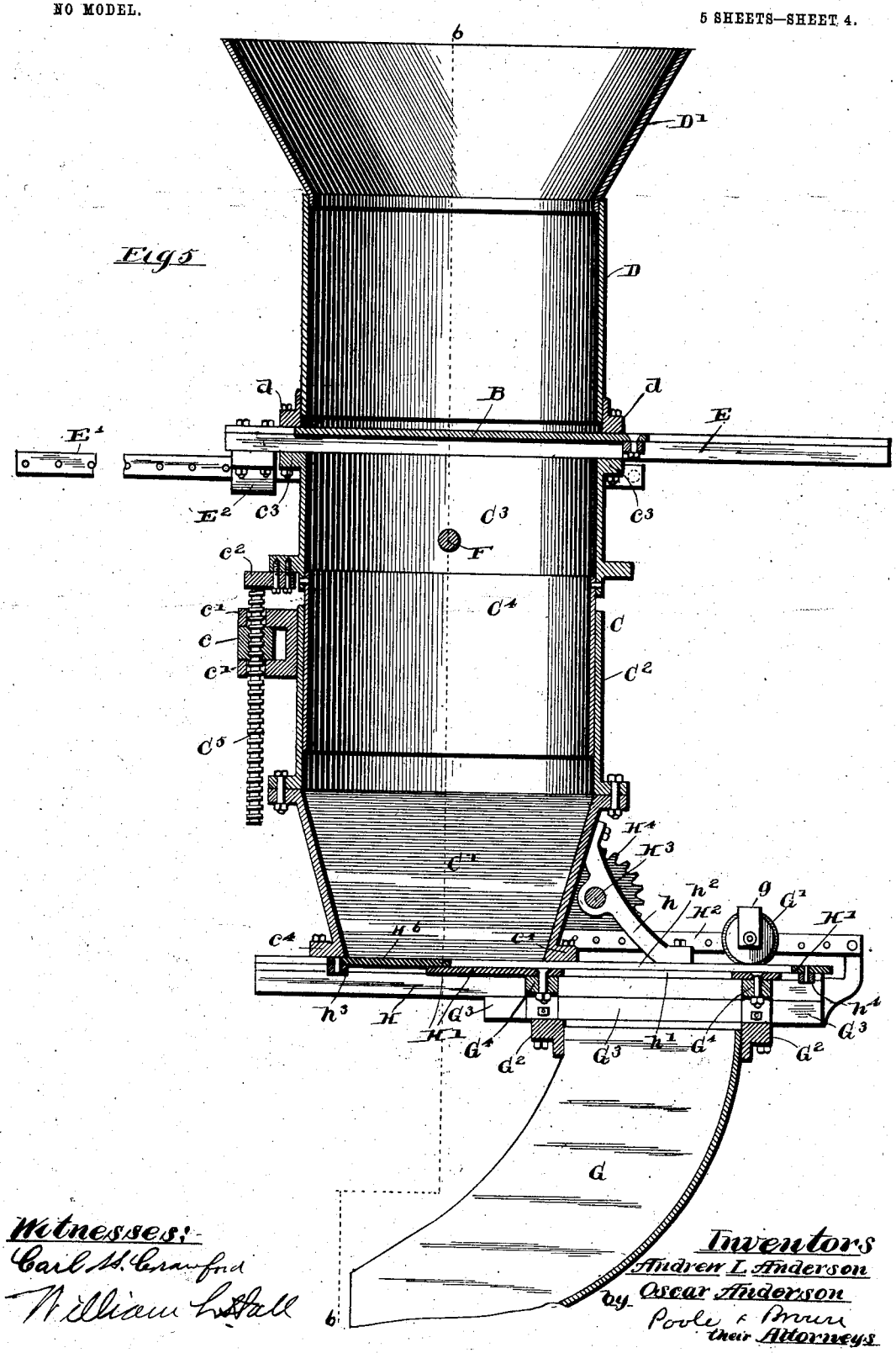
A. L. & O. ANDERSON.

APPARATUS FOR SUPPLYING GRANULAR MATERIAL.

APPLICATION FILED MAY 17, 1902.

NO MODEL. 5 SHEETS—SHEET 4.

Fig 5



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 760,772. PATENTED MAY 24, 1904.

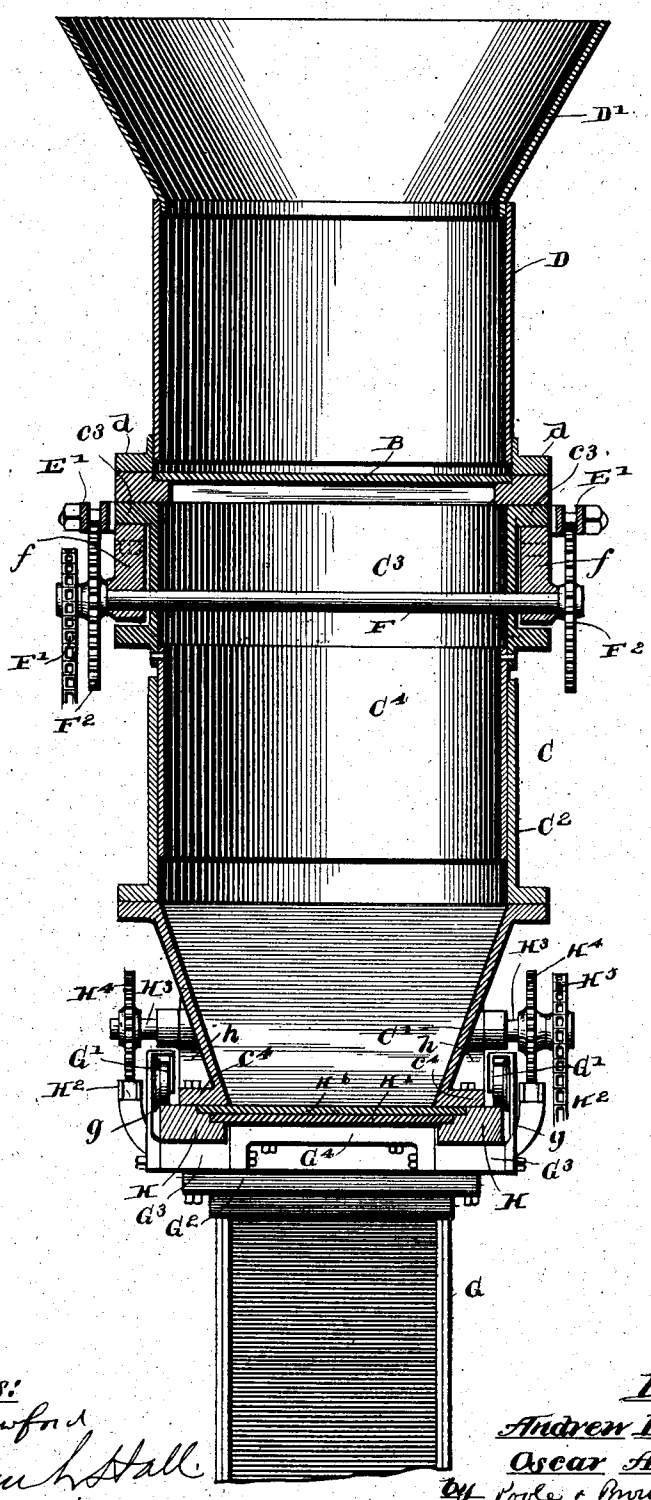
A. L. & O. ANDERSON.

APPARATUS FOR SUPPLYING GRANULAR MATERIAL.

APPLICATION FILED MAY 17, 1902.

NO MODEL. 5 SHEETS—SHEET 5.

Fig 6



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No. 760,772. Patented May 24, 1904.

UNITED STATES PATENT OFFICE.

ANDREW L. ANDERSON AND OSCAR ANDERSON, OF CHICAGO, ILLINOIS.

APPARATUS FOR SUPPLYING GRANULAR MATERIAL.

SPECIFICATION forming part of Letters Patent No. 760,772, dated May 24, 1904.

Application filed May 17, 1902. Serial No. 107,739. (No model.)

To all whom it may concern:

Be it known that we, ANDREW L. ANDERSON and OSCAR ANDERSON, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Apparatus for Supplying Granular Material; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in apparatus for supplying granular material, such as sand, to molding-machines or other devices; and the invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

An apparatus embracing our invention embraces generally a receptacle divided by a door or valve into an upper or receiving and a lower or measusing compartment and having a movable delivery-spout and a discharge door or valve between the measuring-chamber and the delivery-spout, together with operative connections between said last-mentioned valve and spout.

In the drawings, Figure 1 is a side elevation of a sand-feeding device embracing our invention, showing the same in proper position with respect to a sand-molding machine of that type shown and claimed in our prior application for United States Letters Patent, Serial No. 75,667, filed September 16, 1901. Fig. 2 is a plan section of the same, taken on line 2 2 of Fig. 1. Fig. 3 is a plan section taken on line 3 3 of Fig. 1. Fig. 4 is a rear elevation of the same. Fig. 5 is a vertical longitudinal section thereof, taken on line 5 5 of Fig. 4. Fig. 6 is another vertical longitudinal section taken on line 6 6 of Fig. 5.

As shown in said drawings, the sand-supplying mechanism embodying our invention embraces generally a vertically-elongated receptacle extending above the flask A of the molding-machine at one side thereof and supported from the machine, as shown in Figs. 1 and 2, or otherwise. The said receptacle is divided by a horizontally-sliding valve or gate B into a lower compartment or measuring-chamber C and an upper or receiving compartment D, provided with a flaring hopper D′, through which sand is delivered to the receptacle.

G designates a discharge-spout which is adapted to be moved into and out of communication with the lower end of the receptacle, whereby the lower end of the spout may be moved over the flask to deposit sand thereon and be thereafter moved laterally out of the way of the moving parts of the molding-machine. The lower compartment or measuring-chamber is adjustable in size, so that a measured quantity or charge of sand may be delivered to the flask according to the size of the same. Said lower compartment consists of a hopper-shaped section C', which may be secured to the molding-machine or other support, an intermediate part C^2, and an upper part or section C^3. To the lower edge of the upper section is attached a telescopic section C^4, which is adapted to slide vertically with respect to the section C^2, whereby the capacity of the measuring-chamber may be varied. Provision is made for vertically adjusting the upper section C^3 relatively to the section C^2, and thereby effecting such adjustment of the measuring-chamber, consisting of screws C^5, provided with adjusting-nuts c, which engage bracket-bearings c', bolted to the part or section C^2. Said bolts are connected at their upper ends with projecting parts c^2 on the section C^3 of the measuring-chamber. Rotation of the nuts c therefore acts to give longitudinal movement to the bolts, and thereby shift the telescopic section C^3 relatively to the section C^2. Said sections D and C^3 are provided with meeting flanges d and c^3, which are of rectangular form, as seen in cross-section in Fig. 2, and which are formed to provide between them a horizontal slot to receive the horizontally-movable gate or valve B between the receiving and measuring chambers. A guide-frame E extends outwardly from the horizontal meeting flanges d and c^3 to support the gate when retracted or moved outwardly from the receptacle.

E′ E′ designate rack-bars, which are attached to the gate by a cross-bar e, as shown in Fig. 4, and slide in guides or bearing-boxes

E^2, Fig. 5, attached to the guide-frame E on opposite sides thereof.

F, Fig. 6, designates a horizontal shaft, which is mounted in bearings *f f*, connected with the upper part C^3 of the measuring-chamber and which extends through said measuring-chamber. Said shaft is provided on one end with a sprocket-wheel F′, which is adapted to be engaged by a sprocket-chain *f′*, through the medium of which the shaft is rotated. Said shaft is also provided near its ends with gear-wheels F^2 F^2, which mesh with the racks E′ in a manner to retract and close the gate or valve B when power is applied to rotate the shaft F.

Attached to the lower flanges c^4 of the section C′ are two parallel horizontal grooved bars H, arranged to form guides for a spout-carrier frame, by which the sand-spout G is supported and through which the moving parts of a door or gate for the discharge-opening at the lower end of the receptacle are actuated. The said carrier-frame is suspended from the bars H by means of wheels G′ and brackets *g*, on which the wheels are mounted and which are fastened to the carrier-frame. To the said carrier-frame are attached horizontal rack-bars H^2, through which movement is given thereto. Bolted to the guide-bars H and also to the section C′ of the hopper are two bearing-brackets *h*, in which is rotatively mounted a shaft H^3, to the ends of which are affixed gear-pinions H^4, which latter engage and operate the rack-bars H^2, as clearly shown in Fig. 6. To the end of said shaft H^3 is affixed a sprocket-wheel H^5, about which a sprocket-belt is adapted to be trained for rotating said shaft, and thereby operating the rack for giving movement to the carrier-frame. To the top of said sand-spout is attached a square flanged bar G^2, which is bolted to the spout-carrier frame, which latter consists of side bars G^3 and cross-bars G^4, bolted to the same, said side bars G^3 being parallel with the guide-bars H and arranged below and in contact with the same. Resting on the cross-bars G^4 and attached thereto is a valve-plate H′, arranged to slide at its edges in guide-grooves formed in the upper surfaces of the guide-bars H. Said valve-plate is provided with an opening *h′*, located directly over the open upper end of the spout. One end of the valve-plate H′ extends beyond the cross-bar G^4 of the carrier-frame about half-way across the lower open end of the section C′ when the spout is retracted or in the position shown in Fig. 5. Above the door H′ and arranged to slide at its side edges on the guide-bars H is a second valve-plate H^6. The imperforate advance end of this valve-gate is made long enough to extend from the advance end of the plate H′ across the delivery-opening of the receptacle when the doors are retracted, as shown in Fig. 5. In said plate H^6 is formed an opening h^2, which is longer than the opening *h* in the lower valve-plate. At the opposite ends of the valve-plate H^6 are depending stops h^3 h^4, as shown in Fig. 5, against which the plate H′ acts to operate the plate H^6. Said upper valve-plate is actuated solely by movement of the lower valve-plate and spout. Movement of the spout from the position shown in Fig. 5 toward the molding-machine serves to bring the end of the lower valve-plate against the stop h^3 on the upper plate, so as to carry said upper plate forwardly and open the exit-opening of the receptacle gradually to its full extent as the spout is moved beneath the receptacle. By this operation the sand is released and falls into the spout. As the spout is retracted from the molding-machine the outer end of the lower valve-plate strikes the stop h^4 on the rear end of the upper valve-plate, thereby forcing said upper valve-plate back with the lower one and bringing the valve-plates into the position shown in Fig. 5, which closes the lower end of the receptacle.

The separately-movable valve-plate H^6 is employed in order to enable the delivery device as a whole to be located close to the molding-machine without interference with the working parts thereof, it being obvious that the device would need to be located at a considerably greater distance from the molding-machine to give room for the movement of the valve-plate if a single valve-plate of the full width of the discharge-opening of the receptacle were used.

With the sand-delivery devices arranged and connected as described the operation of said sand-delivery devices is as follows: Assuming that the measuring-chamber of the receptacle has been charged or filled, the sprocket-wheel H^5 is rotated through any suitable mechanism to impart rotation to the shaft H^3, and the gear-wheels H^4 on said shaft act through the rack-bars H^2 to move the sand-spout G forwardly beneath the section C′ of the receptacle until the spout is brought under the exit-opening of the same. During the movement of said spout the valve-plate H′, which is attached to and moves with the spout, strikes the projection h^3 on the upper valve-plate and fully opens the valve. After the opening *h′* of the valve-plate H′ has reached a point beneath the opening in the lower end of the receptacle the sand gradually passes through said spout, and the sand is distributed evenly in the flask through the movement of the discharge end of the spout over the same. After the sand-spout has been moved to the limit of its travel and the charge of sand from the measuring-chamber has been deposited in the flask the movement of the spout is reversed. The valve composed of the plates H′ H^6 is closed during the retractive movement of the spout, after which the measuring-chamber is in readiness for another

charge of sand. It will of course be understood that during the forward movement of the spout and when the valve at the lower end of the section C′ is opened the valve or gate B is closed, so as to prevent more than the measured charge of sand passing through the spout into the flask, and, furthermore, that the upper end of the hopper is in communication with a source supplying sand which will supply sand to the receiving-chamber of the hopper as rapidly as it is used. As soon as the chute has been retracted after filling a flask the valve or gate B is opened to recharge the measuring-chamber. Said door B is opened and closed by rotation of the shaft F and gear-wheels F^2 and rack E′ associated therewith, said parts being actuated either automatically or by hand. It will be observed that the capacity of the measuring-chamber and, therefore the charge delivered through the sand-spout to the flask, may be varied by the adjusting-screw C^5, so as to provide the required amount of sand in each operation.

It is obvious that changes may be made in the details of the apparatus shown without departing from the spirit of our invention, and we do not wish to be limited to such details except as hereinafter made the subject of specific claims. Moreover, the mechanism may be applied for intermittingly delivering measured charges of sand or other granular materials to other machines or apparatus, and the illustration and description of the apparatus or device in connection with a molding-machine are for the purpose of showing one practical application of our invention.

We claim as our invention—

1. A mechanism for delivering granular material comprising a receiving-chamber, a measuring-chamber, a valve between said receiving and measuring chambers, a delivery-spout, means for moving the said spout to bring its receiving end into and out of position to receive material from the measuring-chamber, and a valve mechanism controlled by the movement of said spout, constructed to open the valve when the spout is brought beneath the discharge-opening of the measuring-chamber and to close the valve when the spout is moved away from said discharge-opening.

2. A mechanism for delivering granular material comprising a receiving-chamber, a measuring-chamber, means for varying the capacity of the measuring-chamber, a delivery-spout, means for moving the spout to bring its receiving end into and out of position beneath the discharge-opening of the measuring-chamber, and a valve mechanism controlled by the movement of said spout constructed to open said discharge-opening when said spout is beneath the same, and to close the valve when the spout is moved away from said discharge-opening.

3. An apparatus for delivering granular material comprising a receiving-chamber, a measuring-chamber, a valve between the receiving and measuring chambers, a guide-frame in which said valve slides, a rack connected with said valve, a rotative gear-wheel engaging said rack, a delivery-spout, and a valve mechanism between the measuring-chamber and the delivery-spout controlled by the movement of said spout, the valve being adapted to be opened when the spout is beneath the discharge-opening of said measuring-chamber and to be closed when the spout is out of line with the said discharge-opening.

4. An apparatus for delivering granular material, comprising a receiving-chamber, a measuring-chamber, a valve between the receiving and measuring chambers, a horizontally-movable, downwardly-inclined delivery-spout, horizontal guides for the spout at either side of the discharge-opening of the measuring-chamber, and a horizontal valve-plate which is attached to and moves with the spout and is adapted to rest beneath the discharge-opening of the measuring-chamber when the spout is shifted away from said opening and to be moved away from said opening when the spout is brought beneath the same.

5. An apparatus for delivering granular material, comprising a receiving-chamber, a measuring-chamber, a valve between the receiving and measuring chambers, a horizontally-movable, downwardly-inclined delivery-spout, horizontal guides at either side of the discharge-opening of the receptacle, supporting-wheels mounted on the spout and resting in said guides, for supporting said spout from the said guides, and a horizontal valve-plate which is attached to and moves with the spout and which slides on said horizontal guides.

6. A mechanism for delivering granular material comprising a receptacle, a delivery-spout, horizontal guides on the receptacle on which said spout is supported, means for moving said spout into and out of position beneath the discharge-opening of the receptacle, and a valve comprising an apertured valve-plate which has sliding engagement with said guides, an apertured valve-plate which is movable with the spout, and stops on said first-mentioned plate, whereby motion is communicated thereto from the plate which moves with the spout in such manner that when the spout is moved beneath the said discharge-opening the valve is opened, and when moved from beneath the same, the valve is closed.

In testimony that we claim the foregoing as our invention we affix our signatures, in presence of two witnesses, this 13th day of May, A. D. 1902.

ANDREW L. ANDERSON.
OSCAR ANDERSON.

Witnesses:
TAYLOR E. BROWN,
GERTRUDE BRYCE.