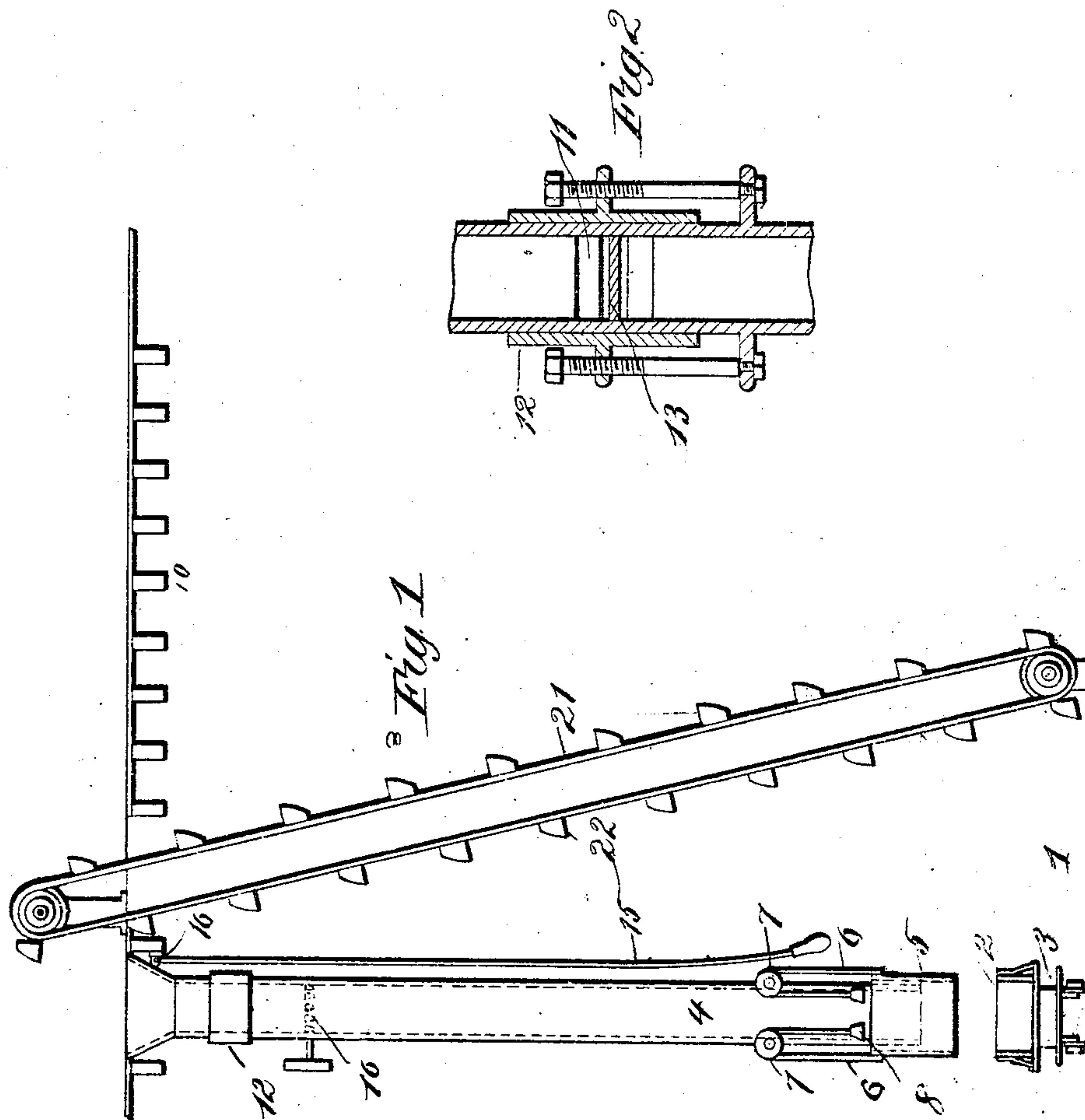


No. 859,120.

PATENTED JULY 2, 1907.

C. R. SCHMIDT.  
ART OF FORMING MOLDS.  
APPLICATION FILED DEC. 11, 1906.

2 SHEETS—SHEET 1.



WITNESSES:

*I. Himes*  
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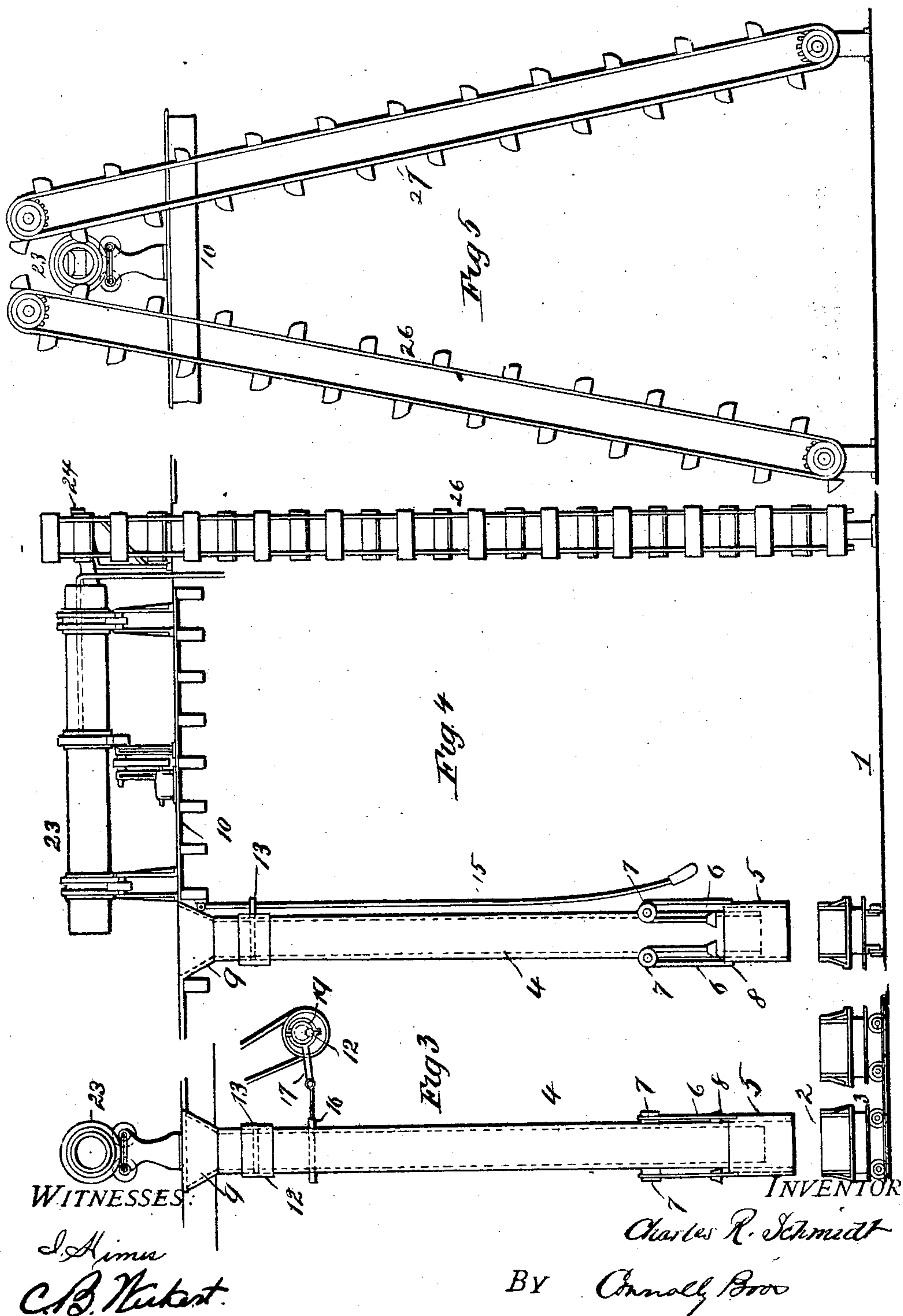
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# UNITED STATES PATENT OFFICE.

CHARLES R. SCHMIDT, OF BALTIMORE, MARYLAND.

## ART OF FORMING MOLDS.

No. 859,120.

Specification of Letters Patent.

Patented July 2, 1907.

Application filed December 11, 1906. Serial No. 347,393.

*To all whom it may concern:*

Be it known that I, CHARLES R. SCHMIDT, a citizen of the United States, residing in the city of Baltimore and State of Maryland, have invented certain new and useful Improvements in the Art of Forming Molds, of which the following is a specification.

This invention has relation to the art of forming molds by the compacting in a suitable flask or mold of sand or other comminuted material such as concrete to form building blocks or mixtures of sand and cement so as to cause the gradual formation of a mass conforming to a pattern or to the interior surfaces of a mold.

Heretofore in compacting finely comminuted material such as concrete or green sand, to form molds it has been the practice to shovel the material into a box to form the mold and to ram it down until compactness and density were obtained. According to this practice it has been impossible to secure such density and homogeneity of the compacted material as would produce wholly desired or uniform results.

The principal object of my invention is to provide an economical and readily available and practicable method of filling and compacting concrete, sand or other material in a mold or flask, which can be carried into operation without the use of skilled labor or expensive apparatus and which will not only produce molds of uniform density and homogeneity with their attending advantages, but will allow of the degrees of density and compactness being regulated to meet varying conditions occurring in the practice of the art of molding.

In carrying my invention into effect I propose to fill a mold and compact the material therein by allowing the sand or concrete to fall into the mold box or flask from a height dependent upon the plasticity of the material, the degree of compactness to be obtained and the capacity of the falling material to compact or cohere. I have found that plastic or semi-plastic material when passed through a riddle and dropped from a sufficient height will be divided by the riddle into small masses or pellets of aggregated particles or grains and that upon falling into a mold-box or flask, these masses or pellets will be crushed or flattened without being scattered and will be compacted together in equal degrees, thus forming a filling for a mold of a uniform density and homogeneity impossible of attainment by any other method. The degree of density obtainable depends 1st, upon the regulated size and weight of the gravitating pellets. 2nd. upon the consistency of the material of which the particles or small aggregations are composed, and 3rd. upon the height from which they fall. These factors being controllable, a mold of any desired density, fineness and compactness may be produced at will and the uncertainties and accidents of hap-hazard work avoided.

In describing means for carrying my invention into

effect it will be expedient to refer to such an apparatus as may be employed in the formation of building blocks, or green sand molds and to refer to a plant in which the flasks or mold-boxes are conveyed from point to point on trucks, each mold-box or flask being brought into requisition on the molding floor as required, filled, finished and removed.

The mold filling devices pertaining to my process of molding comprise an endless conveyer to lift the sand or concrete material from the molding floor to the desired height, a hopper in which the sand is dropped from the conveyer, a vertical chute leading from the hopper to a point above the flask, a measuring chamber, and a riddle or grid to separate the mass of measured material into pellets of the desired size.

In the accompanying drawing, illustrating apparatus for carrying my invention into effect. Figure 1 is an elevation of the sand conveyer, and dropper with appurtenant mechanism. Fig. 2 is a vertical sectional view. Figs. 3 and 5 are end views of part of the apparatus. Fig. 4 is a side view of the mixing and mold filling apparatus.

1 designates the floor of a mold room or foundry and 2 a mold-box or flask mounted on a truck 3 which, in Figs. 1 and 3, is shown as being directly under the discharge end of the vertical chute 4. The chute 4 is aptly a rectangular elongated box like structure, and for the purposes of my invention it is preferable to construct this chute of a size, in cross section, equal to the superficial area of the flask or mold. The chute 4 is extensible at its lower part, and for this purpose is provided with a sliding section 5, which embraces the lower end of the chute 4, and is supported by means of cords or chains 6 passing over pulleys 7 journaled on the chute 4, and carrying counterweights 8, 8, by means of which the sliding section may be adjusted to suit the height of the mold-box or flask and held in position. The chute 4, rises to a proper height—say 20 feet, more or less, and terminates in a hopper 9, at the floor line of a gallery or elevated platform 10.

Below the hopper 9, the chute is provided with a measuring chamber, which is formed by cutting an opening 11 in one side of the chute, incasing the chute at the same point in a sliding open ended box 12, and fitting to the box and chute a horizontally movable gate or valve 13, which forms a cut off within the chute, and which by moving the box 12 up or down may be located at different points. The gate or valve 13 is operated from the floor of the foundry by means of a lever 15 pivoted at 16. Below the valve 13 is fitted a grid or riddle 16 composed of reticulated bars, or a perforated plate, fitted to ways or guides and connected by a pitman 17 to an eccentric 19, on the shaft of a power driven pulley 20, the object being to impart to the grid or riddle a rapid reciprocation motion for the purpose of riddling the



sand and causing it to drop through the interstices from the measuring chamber. The quantity of concrete material or sand constituting a charge for a mold-box or flask is regulated by the capacity of the measuring chamber and this is graduated by the proper adjustment of the cut-off valve or gate 13.

The conveyer 21 is of any endless chain type provided with flights or buckets 22, by which the concrete material or sand is lifted continuously from the floor or from a bin, above and to the hopper in a practically constant stream.

When the apparatus is intended for filling molds for building blocks, a rotary mixing machine 23, is mounted on the stage or platform 10, with its outlet and adjacent to the hopper 9, so that the mixed concrete may fall into the latter in a practically continuous manner. The forward end of the mixing tank has a hopper or filling chute 24, and to supply the mixer with the ingredients of the concrete mixture in proper proportions, two endless, bucket conveyers 26 and 27, are arranged at opposite angles so as to convey the materials from the floor or earth level to a point above the mixer and directly over its hopper or mouth. One of these conveyers will carry, say cement, and the other sand or rubble, and for whichever ingredient is used in the greatest proportion, the buckets of its conveyer will be proportionally larger than those of the other conveyer. By the use of the two conveyers the supply to the mixing tank of the concrete, in the same relative proportion will be constant and uniform.

It is to be remarked that by the method described of filling molds, the uniform compactness and density of the mass in the mold box is insured, regardless of the depth or thickness of the mold, or of the block to be molded. This cannot be accomplished by any process depending on pressure, such as ramming, packing or pounding, as in a mold of say 12 inch depth, the pressure required is greatly in excess of what is necessary to compact a depth of say six inches and even then the points of contact only are compressed hard, while the center of the mass remains soft or imperfectly compressed.

I am aware that it has been proposed to form molds

by dropping screened or sifted material from a height into a mold box, and then consolidating and facing off the material in the mold by mechanical strikers, but this method differs radically from my method, in which the material is dropped in the form of a shower or volley of pellets of such size that they will be crushed or flattened without being scattered and compacted to the required extent by gravity alone and will not require subsequent manipulation. In fact I wish to avoid, as detrimental, the mechanical consolidating or facing off of the material which would impair the homogeneous character of the mold.

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

1. The improvement in the art of forming molds, which consists in dropping the molding material into the mold in the form of a shower of soft pellets, from such height as will cause the pellets to be compressed by gravity alone into a compact mass of practically uniform density.

2. The improvement in the art of forming molds of plastic or semi plastic materials, which consists in measuring the exact quantity of material to fill or charge a mold or flask, depositing the measured charge upon and subjecting it to the action of a divider, or distributing device, such as a grid or riddle, and dividing the mass into small pellets, regulating the size of said pellets, according to the plasticity of the mass, and the height from which the pellets are to fall, and then dropping said pellets into a mold box or flask from such a height that they will compact themselves together and fill the mold or flask.

3. The method of continuously mixing and molding concrete for the production of building blocks, consisting in continuously conveying the ingredients of the mixture in automatically regulated proportions to a mixing machine, mixing the ingredients therein, delivering the mixture to a vertical chute, measuring a charge for a mold therein, subdividing the measured mass into pellets, dropping the divided charge into a mold box and concentrating and compacting the pellets by gravity into a compact mass.

4. The improvement in the art of forming molds, which consists in riddling and dividing a mass of the molding material into pellets and dropping a shower or volley of the pellets into a mold box from a height sufficient to cause them to be crushed and compacted by the fall into a coherent mass of uniform density.

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

CHARLES R. SCHMIDT.

Witnesses:

THOS. A. CONNOLLY,  
JOS. B. CONNOLLY.