C. C. PETERSON.

CORE MAKING MACHINE.

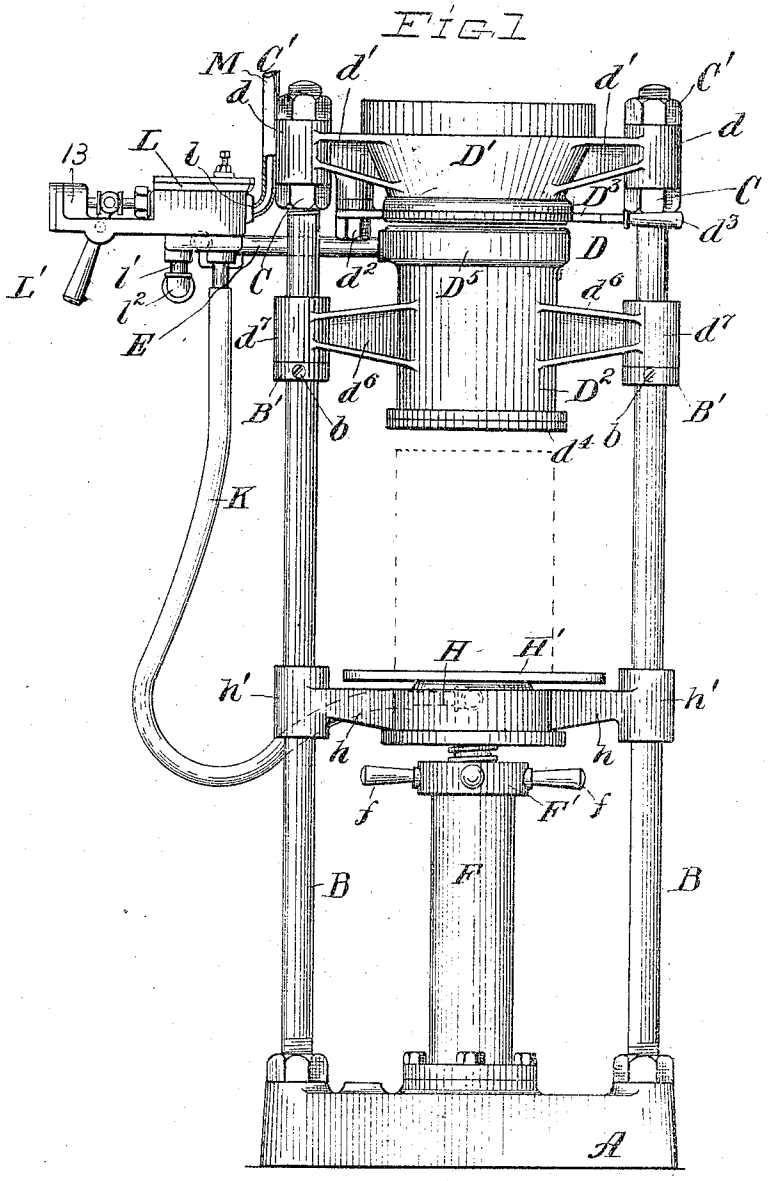
APPLICATION FILED MAY 4, 1911.

1,030,326.

Patented June 25, 1912.

4 SHEETS—SHEET 1.

FIG. 1



Witnesses.

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4 SHEETS—SHEET 2.

Fig. 2

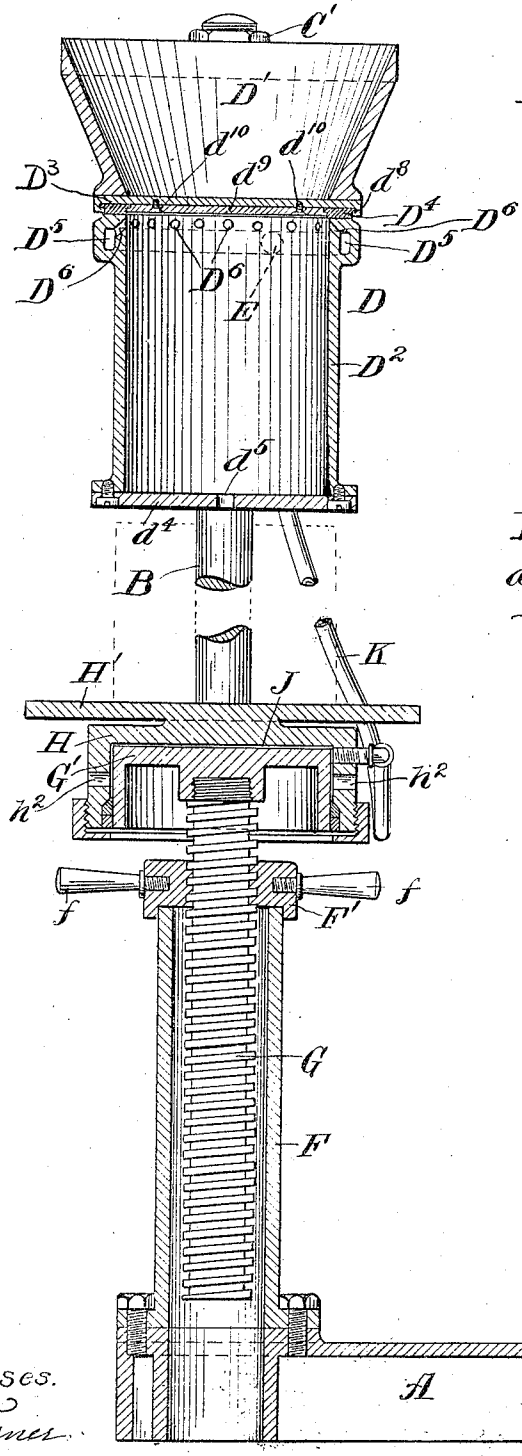
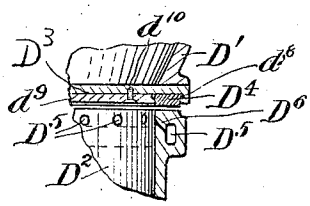


Fig. 5



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4 SHEETS-SHEET 3.

FIG 3

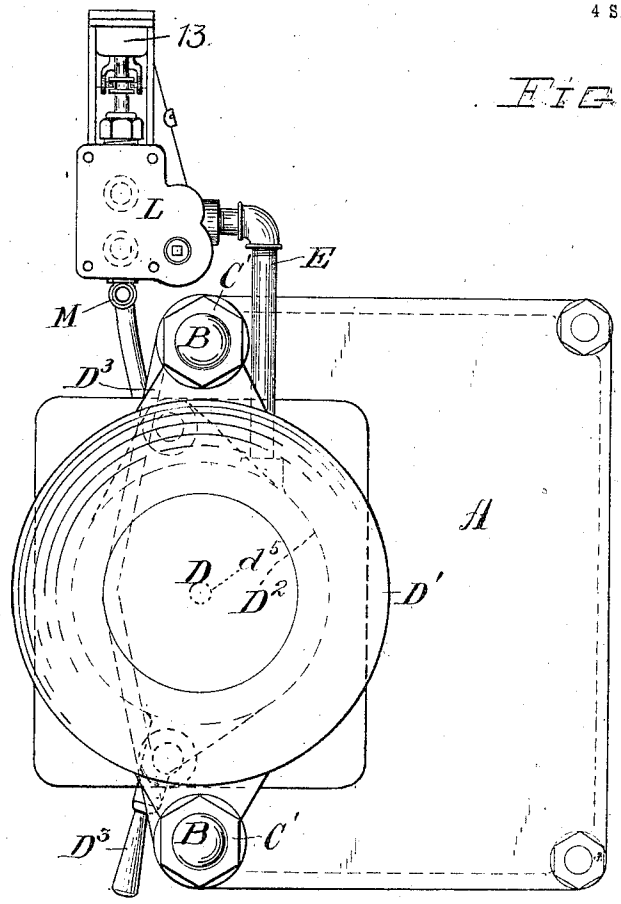
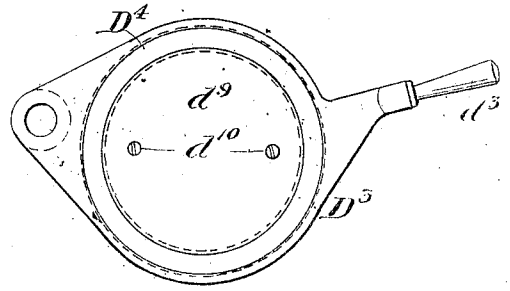


FIG 4



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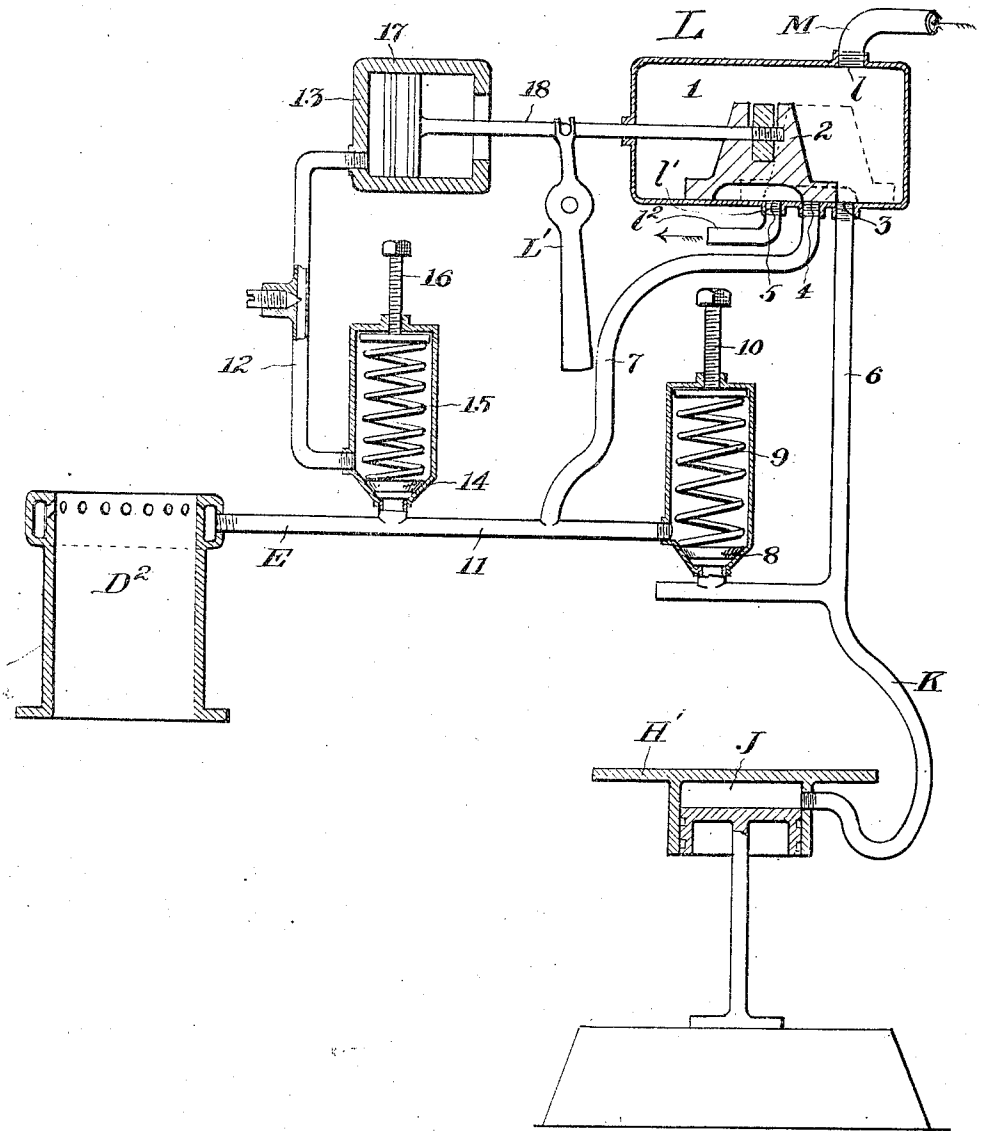
4 SHEETS—SHEET 4.

FIG. 6



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UNITED STATES PATENT OFFICE.

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CORE-MAKING MACHINE.

1,030,326. Specification of Letters Patent. Patented June 25, 1912.

Application filed May 4, 1911. Serial No. 625,103.

To all whom it may concern:

Be it known that I, CHARLES C. PETERSON, a citizen of the United States, resident of Oil City, county of Venango, and State of Pennsylvania, have invented a new and useful Improvement in Core-Making Machines, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to core-making machines, and particularly to the class of machines adapted to provide the core-box with the core-making sand.

The object of the invention is to provide mechanism which will effect this purpose in an economical and efficient manner.

The said invention consists of means which are hereinafter fully described and particularly set forth in the claims.

The annexed drawings and the following description set forth in detail certain means embodying my invention, the disclosed means, however, constituting but one of various mechanical forms in which the principle of the invention may be applied.

In said annexed drawings:—Figure 1 is an elevation of a machine embodying my invention. Fig. 2 is an axial section of the main portion of said machine on an enlarged scale, and shown broken away at the center. Fig. 3 is a plan of the machine. Fig. 4 is a detail bottom plan of the valve for controlling the discharge of sand from the hopper. Fig. 5 is a fragmentary axial section of the sand-holder, showing the members thereof, in their normal or non-operating positions. Fig. 6 is a view showing diagrammatically the construction of the semi-automatic valve for controlling the operation of the machine.

The machine illustrated by the drawings as embodying my invention comprises a base A upon which is secured two vertical guiding rods B B. The upper end of each of these rods is threaded, and upon these threads are mounted two nuts C C. Resting upon these nuts are two hollow bosses d d formed on lateral extensions d' d' forming an integral part of the hopper D' which forms a part of a sand-holder D. Nuts C' C' are mounted upon the threads of the rods B B, and secure the hopper in place on the nuts C C.

In addition to the hopper D', the sand-holder D comprises a lower sand-discharging member D^2 and a valve D^3. This valve is of the pivoted gate variety, and has its pivotal axis located laterally of the hopper and in a bolt d^2. The free or swinging end of the valve is provided with a handle d^3. By moving the valve upon its axis, it will be seen that the lower or discharging end of the hopper may be open or closed.

The discharging member D^2 is mounted below the hopper, and consists of a hollow pot having its upper end open, forming an inlet opening, and its lower end closed by a plate d^4 having a central discharge opening d^5. Formed integrally with the sides of this pot are lateral projections d^6 d^6, which are formed with hollow bosses d^7 d^7 loosely surrounding the rods B B, as shown in Fig. 1. These bosses rest upon the collars B' B' which are fixed to the rods by means of set-screws b b, whereby such collars may be adjusted to assume various positions upon said rods. These collars are in a position such that when the device is inoperative, that is, when the bosses d^7 rest upon the collars, the upper or charging end of the pot is out of contact with the valve D^3, as shown in Figs. 1 and 5. That part of the valve directly opposite the end walls of the pot D^2 is provided with an annular gasket D^4, Fig. 5, which normally projects slightly below the lower surface of the valve, and is made of yielding material of a suitable nature. The extreme outer edge portion of the valve is provided with an interior groove d^8, and the gasket is formed with a flange projecting into this groove. The inner portion of the flange is held in place by means of a removable plate d^9 secured in place by means of screws d^{10} d^{10}, as shown in Figs. 2 and 5.

Surrounding the upper end of the pot D^2 is an annular air-duct D^5 which communicates with the interior of the pot by means of a plurality of upwardly inclined passages D^6. This duct is furthermore connected with a source of pneumatic pressure by means of a flexible pipe E, as will be hereinafter explained.

Fixed to the base A, and projecting vertically and midway between the rods B B, is a hollow standard F, Figs. 1 and 2. This standard has rotatably mounted upon its top a nut F' which is provided with suitable handles f f, whereby it may be conveniently turned. This nut engages a screw G which carries upon its upper end a piston G'. This piston forms in conjunction with a cylinder H an interior air-chamber J. Suit-

able packing and glands are provided for rendering the piston and cylinder air-tight. Formed upon the upper portion of the cylinder is a table H′ which is adapted to receive the core-box and upon which the latter is adapted to rest. Formed integrally with the cylinder are two lateral projections h' h' loosely and slidably mounted upon the rods B B. A pipe K connects the air-chamber J with the source of pneumatic pressure before mentioned, and in a manner hereinafter described.

The pipes E and K are connected with outlet openings of a semi-automatic valve L, provided with an operating lever L′ and an inlet opening l connected with the source of pneumatic air-pressure by means of a pipe M, together with an exhaust opening l' connected with an exhaust pipe l^2 discharging into the atmosphere.

The device as thus far described operates as follows: Assuming the parts to be in their normal or inoperative position, in which the cylinder H and table H′ occupy their lowermost position, and the discharge member or sand-pot D^2 is in its lowermost position resting upon the collars B′ B′, so that its upper end is out of contact with the valve D^3, and the latter being in its closed position, the hopper D′ is filled with the sand to be discharged into the core-box. Said valve is now opened so as to permit the sand to fall down into the discharging member D^2, and after this has been accomplished the valve is again closed, such valve operation being permitted by reason of the nonengagement of the member D^2 with such valve. The core-box, shown in dotted lines in Fig. 1, is placed upon the table in a suitable position below the member D^2, the position of the table having first been adjusted by means of the screw F′ so as to allow the upper end of the core-box to fall some distance below the lower end of said member D^2, when the parts are in their normal or inoperative position. By now throwing the handle L′ over to the right, communication is established between the source of pneumatic pressure and the air-chamber J. The consequent introduction of compressed air into said chamber causes the cylinder and table to rise, carrying the core-box with it, until the upper end of the latter strikes the lower end of member D^2, thus establishing communication between the interior of the core-box and the interior of said member through the discharge opening d^5. A further movement of the table upwardly carries the box upwardly a further distance, and with it the member D^2, the latter continuing such movement until its upper end strikes the gasket D^4 of the valve D^3. This gasket is therefore compressed and an air-tight connection is made with the upper end of the member D^2, whereby such upper end is sealed. The communication with the source of pressure continues until the member D^2 is brought to a stationary position, and until the pressure in the chamber J reaches a point such that an auxiliary valve in the interior of the valve L, as a result of such increased pressure, automatically establishes communication between the source of pressure and the interior of the member D^2 through the pipe E, air-duct D^5 and openings D^6. The air is thereupon discharged upwardly against the valve D^3, whence it is deflected downwardly against the sand in the interior of the pot. This action causes an air-pressure to be exerted upon the top of the sand and the latter to be projected through the opening d^5 into the core-box. After all the sand has been discharged from the holder, or the core-box has been filled, the communication is permitted to continue a sufficient length of time so as to bring the pressure up to a point where it is sufficient to open a second auxiliary valve as a result of such increased pressure, which automatically shuts off communication between the source of pressure, the interior of the pot and the air-chamber J, and at the same time establishes communication between said interior and chamber and the exhaust outlet 5 and exhaust pipe l^2. This operation is attended by the movement of the lower end of the handle L′ to the left so as to re-assume its initial position. The pressure thus being removed from the chamber J, the latter drops as a result of gravitation and the core-box may be removed, the member D^2 similarly dropping to its normal position by gravity.

As before noted, Fig. 6 represents diagrammatically the construction of the semi-automatic valve and its connections with the discharging members D^2 and the air-chamber J.

The operation of the above-described automatic valve is best explained by the diagrammatic illustration shown in Fig. 6. I shall now explain such operation by reference to said diagram.

I a valve-chamber 1 is a slide-valve 2, of the ordinary D type, which controls three ports, 3, 4 and 5. The port 3 is connected with a duct 6, in the valve casing, whose outlet opening is connected with the flexible pipe K, which, as before explained, communicates with the chamber J of the machine. The port 5 is connected with the outlet l' and exhaust, and the port 4 communicates with a duct 7 whose function will be hereinafter explained. The valve 2 is arranged so that when the lower end of the lever L′ is thrown to its extreme position to the left, as shown in Fig. 1, said valve will permit communication between the ports 3 and 4 and the exhaust port 5, as shown in dotted lines in the diagram. The

duct 6 communicates with the duct 7, but such communication is controlled by a spring-actuated valve 8 normally closed. This valve is held in such normally closed position by means of a spring 9 whose tension may be regulated by means of a screw 10. A duct 11 connects the ducts 7 and 6 with a second outlet in the casing to which is connected the pipe E which communicates with the interior of member D^2, as before explained. By means of a duct 12, communication is established between the duct 11 and the interior of a cylinder 13, and this communication is controlled by means of a spring-actuated valve 14 held normally closed by means of a spring 15 whose tension may be regulated by means of a screw 16. Within the cylinder 13 is a piston 17 to which is attached the valve rod 18 extending into the valve chamber 1, and connected with the valve 2. The operating handle L′ is connected in a suitable manner with the valve stem 18. The inlet opening *l* of the chamber 1 is connected with the pipe M which communicates with a source of air-pressure.

Assuming now that the lower end of the operating lever L′ is in its extreme left position, and that lower end is now manually thrown to the right so as to cause the piston 17 and valve 2 to be thrown to the left, it will be seen that communication is established between the source of pressure and the port 3. In this position the ports 4 and 5 are cut off from communication with the valve chamber and hence with the source of pressure. This permits the compressed air to enter the duct 6 and thence the pipe K, and raise the table and core-box. After the core-box and moving parts of the machine are brought to a stationary position, the pressure rises until it reaches a point such as to effect the raising of the valve 8 against the action of the spring 9, this spring having been previously adjusted to exert the proper pressure on said valve. This permits the air to flow into duct 11, pipe E and member D^2. The spring 15 is set so that it requires a further pressure to raise the valve 14. When the sand has been completely discharged from the member D^2, or the core-box is filled, the continued communication with the source of pressure provides this increased pressure, and the raising of the valve 14 is effected. This establishes communication between ducts 11 and 12, and permits the air to flow into the cylinder 13, and move the piston 17 to the right, and move the valve into the position indicated by dotted lines. This, as before explained, establishes communication between port 3 and ports 4 and 5, which, as will be observed, will permit the air from the chamber J to exhaust through the port 5, and the air from the air-inlet member D^2 to similarly exhaust through the ducts 11 and 7, and thence through the exhaust port 5. In this manner, it will be seen that the machine is started by throwing the lower end of the operating handle L′ to the right, which effects the raising of the table H′. Communication is thereupon automatically established with the interior of the member D^2, and following such action the valve is automatically shifted so as to exhaust the chamber J and the interior of member D^2, whereupon the parts of the machine assume their normal or inoperative positions by gravity, as previously explained.

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

1. In a core-making machine, the combination of a sand-holder; pneumatically operated means for establishing communication between the interior of said holder and a core-box; means for introducing air under pressure into said holder, whereby the sand therein may be discharged therefrom; a common source of pneumatic pressure connected with said means for establishing communication and said means for introducing air under pressure; and means for controlling the flow of air through said two means, whereby the air-pressure is introduced into said holder after communication between said holder and core-box has been established.

2. In a core-making machine, the combination of a sand-holder; pneumatically operated means for establishing communication between the interior of said holder and a core-box; means for introducing air under pressure into said holder whereby the sand therein may be discharged therefrom into said sand-box; a common source of pneumatic pressure connected with the means for establishing communication and the means for introducing air under pressure; and means for controlling the flow of air from said source whereby said first-named means are first actuated and said second-named means actuated subsequently thereto.

3. In a core-making machine, the combination of a sand-holder; pneumatically operated means for establishing communication between the interior of said holder and a core-box; means for introducing air under pressure into said holder whereby the sand therein may be discharged therefrom into said sand-box; a common source of pneumatic pressure connected with the means for establishing communication and the means for introducing air under pressure; and means for automatically controlling the flow of air from said source whereby said first-named means are first actuated and said second-named means actuated subsequently thereto.

4. In a core-making machine, the com-

bination of a sand-holder having a discharge opening therein; a table for receiving the core-box and movable toward and from said holder, whereby the said box may be brought into contact with said holder and into communication with said opening; a source of pneumatic pressure; means connecting such source with said holder and said table; and means for controlling such connection and arranged to first effect the movement of the table toward said holder, and subsequently automatically connect said holder with such source.

5. In a core-making machine, the combination of a sand-holder having a discharge opening therein; a table for receiving the core-box and movable toward and from said holder, whereby the said box may be brought into contact with said holder and into communication with said opening; a source of pneumatic pressure; means connecting said source with said holder and with said table, and communicating with the atmosphere; and means for controlling such connection, adapted first to effect the movement of said table, and subsequently automatically and successively connect said source with said holder and with the atmosphere.

6. In a core-making machine, the combination of a sand-holder comprising a hopper, a valve for controlling the discharge from said hopper, and a sand-discharging member mounted so as to be movable toward and from said hopper and provided with a discharge-opening, whereby it may be brought into contact with said valve, said member being normally out of contact with the latter; a table for receiving the core-box, and movable toward and from said discharging member, whereby said box may be brought into contact therewith and into communication with said opening; means for effecting the movement of said table toward said holder; and pneumatic means connected with said discharging member whereby the sand therein may be discharged through said opening.

7. In a core-making machine, the combination of a sand-holder comprising a hopper, a gate-valve mounted on and adapted to close the bottom of said hopper, and a sand-discharging member opposite said valve, normally out of contact therewith and movable toward and from same, said member provided with a discharge-opening; a table for receiving the core-box and movable toward and from said discharging member; means for effecting the movement of said table toward said member whereby the core-box may be brought into contact therewith and into communication with said discharge-opening; and pneumatic means connected with said discharging member whereby sand therein may be discharged through said opening.

8. In a core-making machine, the combination of a sand-holder comprising an upper hopper-member, a gate-valve mounted upon the lower end of same and adapted to close its discharge-opening, a lower sand-discharging member having an upper inlet-opening and a lower discharge-opening, and movably mounted whereby its receiving end may be brought into contact with said valve; a table below said discharge-opening and movable toward and from same; means for effecting the movement of said table toward said lower member whereby the core-box may be brought into contact with said discharging member and into communication with said opening, and connected with said discharging member, whereby sand may be discharged therefrom through said opening into said box.

9. In a core-making machine, the combination of a suitable frame; a sand-holder mounted upon said frame and having a lower discharge-opening therein; an air-chamber formed by two members, one of which is stationary and the other of which is movable relatively thereto, said movable member being provided with a table for receiving a core-box; a source of pneumatic pressure; means having an exhaust opening into the atmosphere connecting said sand-holder and air-chamber with said source of pressure; and semi-automatic means normally cutting off such atmospheric communication, and arranged to first effect the movement of said table, and subsequently to automatically effect first the connection of said sand-holder with said source, and then connect said air-chamber with the exhaust opening.

10. In a core-making machine, the combination of a sand-holder; a hopper immediately above said holder; means between said hopper and holder for controlling communication between same, said hopper and holder being relatively movable toward and from each other whereby said holder may be brought into engagement with said intermediate means and thereby sealed; and means below said holder for bringing a core-box in engagement with said holder; said intermediate means being adapted to close the discharging end of said hopper.

Signed by me, this 25 day of April, 1911.

CHARLES C. PETERSON.

Attested by—
H. M. Wood,
F. H. Holmes.