E. L. ELWELL.

MACHINE FOR MAKING MICA PLATES AND THE LIKE.

APPLICATION FILED FEB. 18, 1909.

934,057. Patented Sept. 14, 1909.

4 SHEETS—SHEET 1.

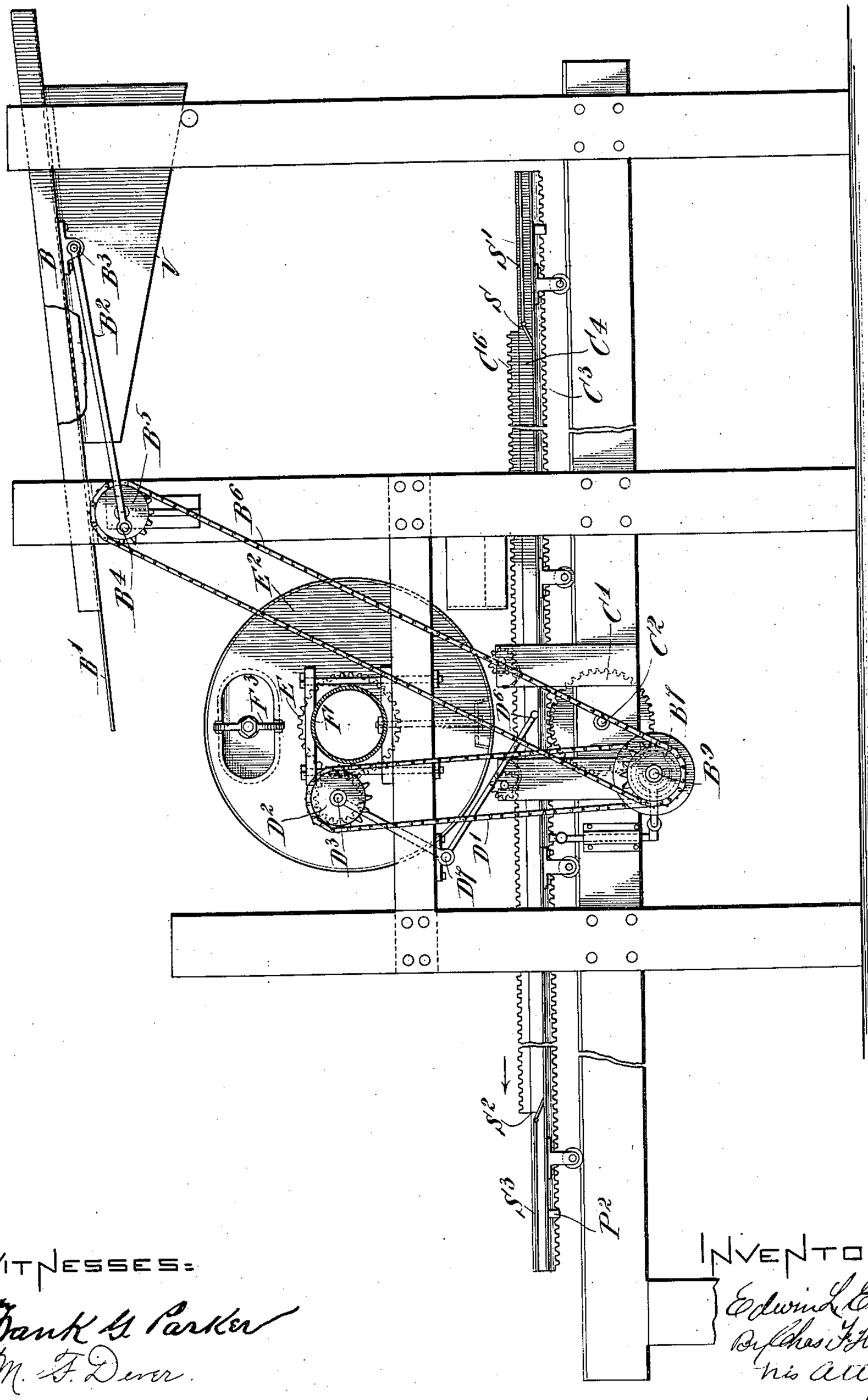

Fig. 1.

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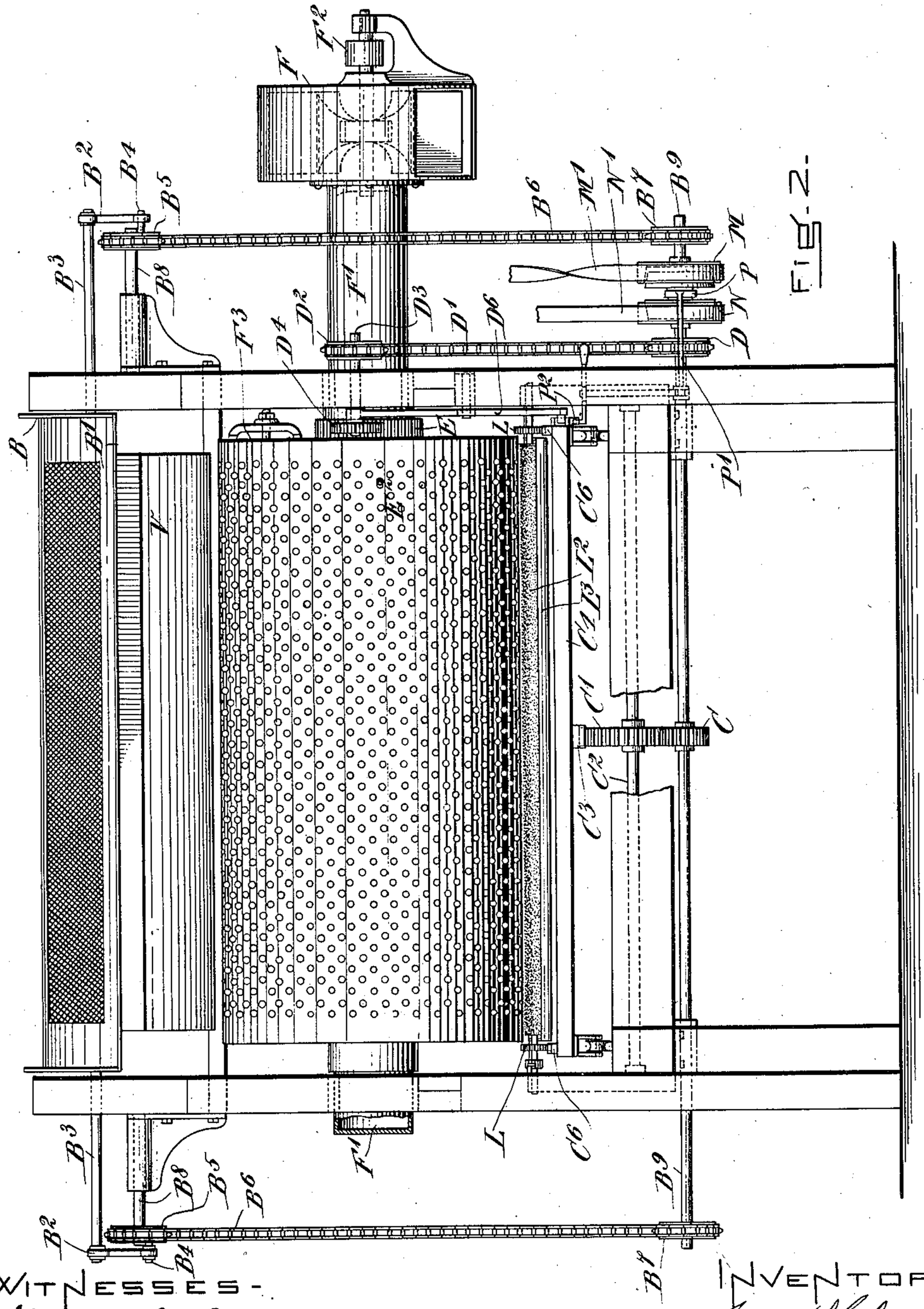

FIG. 2.

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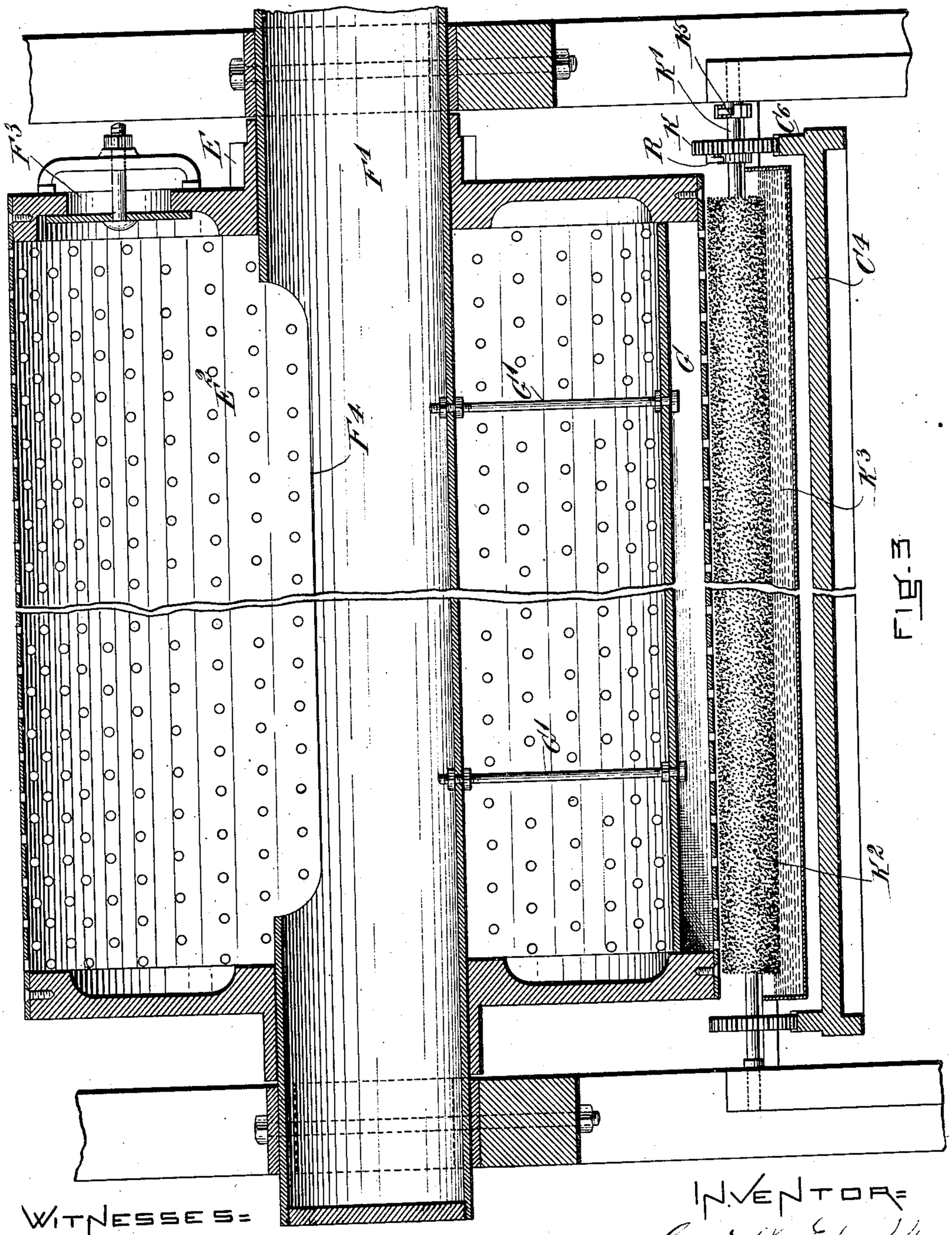

FIG. 3.

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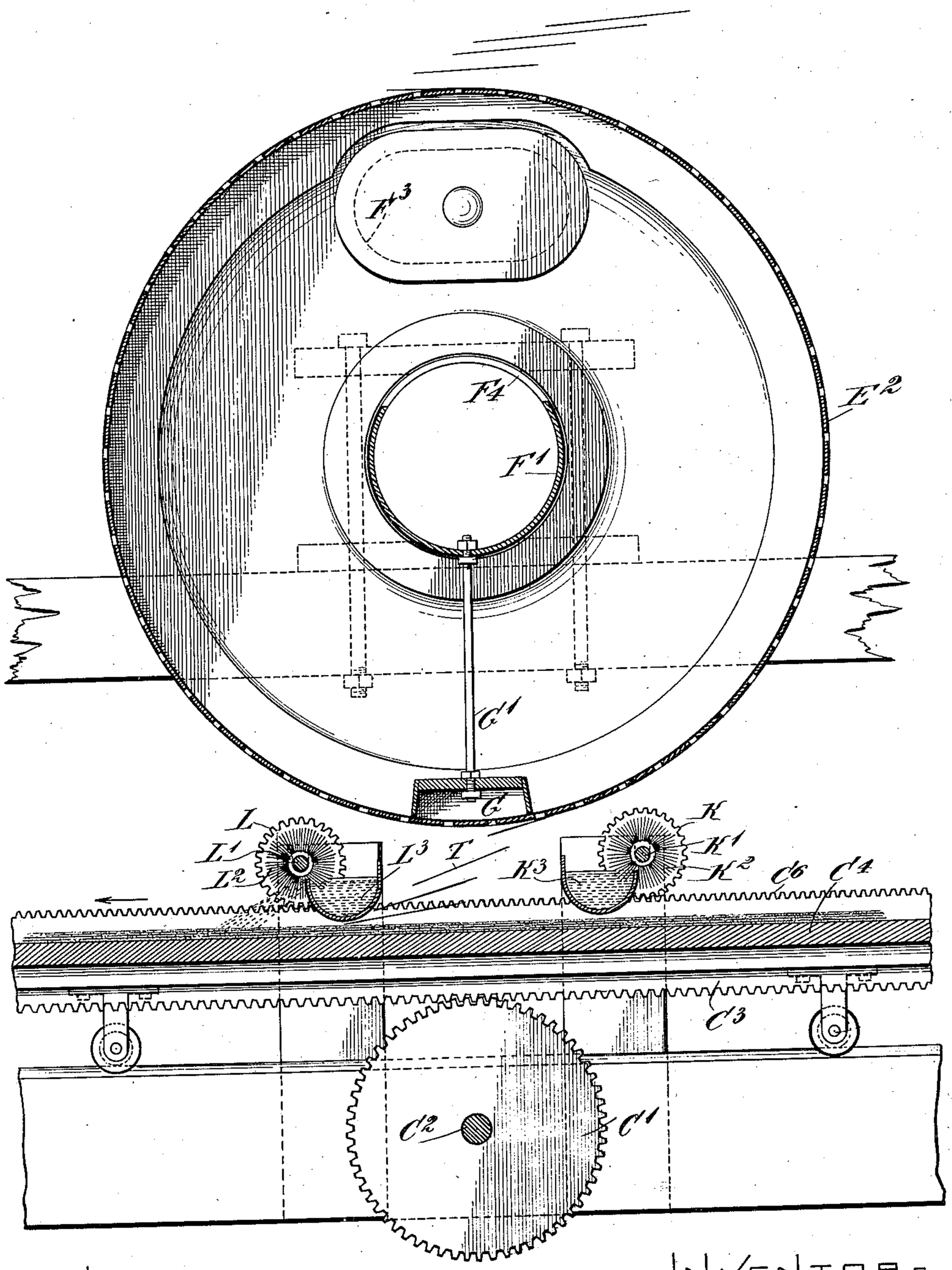

Fig. 4.

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UNITED STATES PATENT OFFICE.

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MACHINE FOR MAKING MICA PLATES AND THE LIKE.

934,057. Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed February 18, 1909. Serial No. 478,588.

To all whom it may concern:

Be it known that I, EDWIN L. ELWELL, a citizen of the United States, residing in Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Machines for Making Mica Plates and the Like, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to a machine for making comparatively thick and solid sheets or blocks, by combining, with the aid of cement, thin irregular laminations of mica or other substances; and consists in mechanically separating the laminæ from dust and other foreign substances and in arranging them in layers upon an inclined bed, then by vibrating the said bed to cause the laminæ to slide on to a carrier which in turn deposits them upon a moving bed where cement is applied to them, whereby a firm, thick sheet or block is formed.

The object of this invention is to produce a machine that will substitute rapid, certain and economic mechanical work for the expensive and uncertain manipulations now in use. This object I attain by the mechanism shown in the accompanying drawings in which—

Figure 1 is a side elevation of my machine; Fig. 2 is an end elevation of the same; Fig. 3 is a vertical longitudinal section taken through the center, one of the cement distributing cylindrical brushes being shown in full; Fig. 4 is a cross vertical section of the machine.

In the drawings B represents an inclined bed or flat inclined hopper having a foraminous bottom and an extension B′ which serves to carry the laminæ forward to a point about over the carrier cylinder E^2. Links B^2 are connected to the cross shaft B^3, see Figs. 1 and 2, and this cross shaft B^3 is operated by a crank pin B^4 on wheels B^5 which are driven by chain belts B^6 and sprockets B^7 on the shaft B^9. The shaft B^3 is connected to the hopper and gives a forth and back motion to the said hopper which forth and back motion serves a double purpose, namely, it has a sifting motion which causes all of the dust and other objectionable substances to fall through the openings and to lodge in the chute and to be conveyed by it away from the machine into a convenient receptacle. The said sprocket wheel B^5 is rotated by the chain belt B^6 which communicates motion from the wheel B^7.

As the laminæ of mica or other substance fall from the extension B′ upon the rotating hollow cylinder E^2 they are drawn down to lie flat on the cylinder by currents of air that are made to flow through the perforations in the outer surface of the said cylinder E^2, see Figs. 2 and 4; as the cylinder rotates the laminæ are held upon the surface of the cylinder by the inflowing currents of air and carried downward until they reach the air chamber G, Figs. 1 and 4; this air chamber is stationary, being held by the bars G^1 to the stationary air pipes, and contains free air not influenced by the partial vacuum maintained in the rotating cylinder E^2. For convenience of getting to the interior of the cylinder a manhole F^3 is made.

A partial vacuum is maintained in the rotating cylinder E^2 by means of the stationary tube F^1, this tube is held to the framework of the machine by suitable fastenings, and serves as an arbor for the cylinder E^2 to rotate upon; air is drawn from the cylinder E^2 through the tube F^1 and its opening F^4 by means of a vacuum blower F of any approved kind, the said blower is driven by a belt acting on the pulley F^2, see Fig. 2. Motion is given to the cylinder E^2 by the following-described mechanism. A shaft B^9 has upon it two belt pulleys M and N each of which is loose upon the shaft B^9 except that either may be made to drive the shaft B^9 by the clutch P; that is, when the clutch is in contact with the pulley M the cross belt M^1 will drive the shaft B^9 in one direction, but when the clutch P is in connection with the pulley N then the direct belt N^1 will drive the shaft B^9 in the other direction. The clutch P is operated by a rod P^1 and is operated by a system of levers and a lug or projection P^2 (Fig. 2) on the forth and back moving table C^4 in the same manner that the bed of an ordinary machine-shop planer is operated and need not be more fully described. A chain belt D^1 (Fig. 2) transmits motion from the sprocket wheel D on the shaft B^9 to the wheel D^2 on the shaft D^3, a gear wheel D^4 on the said shaft D^3 engages with the gear E connected to one of the end pieces of the drum E^2 which causes it to rotate. The shaft D^3 is mounted upon a swinging bent lever D^5, D^6 which is pivoted upon a pivot D^7. This bent lever D^5, D^6 is operated by switch devices S, S^1—S^2,

S^3 on the moving bed plate C^4, Figs. 1 and 2, which will be hereinafter described.

The bed plate C^4 moves forth and back and is a table upon which the laminæ fall as they are released from the cylinder E^2 when they arrive at the free air chamber G. The table C^4 is operated by a spur gear C on the shaft B^9 this spur gear C engages with the spur gear C^1 on the shaft C^2, see Figs. 2 and 4, and as the said spur gear C^1 engages with the rack C^3 on the table C^4; it gives motion to the said table, that is, it causes it to move forth and back in harmony with the direction of the shaft B^9 whose motion is governed by the clutch P and the belts M and N as has been explained.

To cause the laminæ to form a compact mass that is a thick plate or block on the table, C^4, I have devices for spraying an adhesive mixture on to each layer of laminæ as the table moves back and forth. These devices may be described as follows: Two troughs L^3 and K^3 are fixed across and above the table C^4 see Fig. 4; above these troughs I have cylindrical brushes K^2 L^2 mounted upon shafts K^1 and L^1 as shown; these shafts K^1 and L^1 have at each of their ends spur gears K and L and these gears engaging with the racks C^6 will be made to rotate as the table moves back and forth and as the brushes K^2 and L^2 are mounted upon the said shafts and are connected thereto by means of pawls and ratchet wheels R. The said ratchet wheel and pawls will allow the gears to rotate in one direction only, without causing the brushes to rotate. Thus it may be understood that as the table moves in one direction one of the brushes will rotate and the other stand still. For instance, if the table C^4 is moving in the direction of the arrow, Fig. 4, then the brush L^2 will distribute cement on to the laminæ, but if the table is going in the other direction, then the brush K^2 will work. The table C^4 has a length of movement that is governed by the location of the stud P^2 precisely as the movement of the bed plate of a planer is governed. This length of movement of the table governs the length of the plate of laminated matter that is to be produced. To prevent the carrier cylinder E^2 from delivering laminæ to the table after the said table has arrived at the desired point of its movement, I have the following described device, see Fig. 1: At two points on the table I have switch devices S, S^1 and S^2, S^3. Now if we suppose that the table is moving in the direction of the arrow then when the switch S, S^1 arrives at and comes in contact with the lower end D^6 of the bent lever D^5, D^6, then the end will be lifted and this action will throw the upper end that carries the spur gear D^4, Fig. 2 out of contact with the gear E thus causing the cylinder E^2 to cease to rotate. If the table C^4 were moving in the opposite direction, then the switch device S^2, S^3 would act to stop the cylinder.

The operation of my machine is as follows: The thin sheet of mica or other laminated substance is placed upon the flat, inclined, foraminous hopper B from which the action of the said hopper causes the laminæ to slide downward (allowing the dust, dirt, etc., to fall into the chute V) to the extension part B^1 which is not perforated; from B^1 the laminæ fall on to and rest upon the vacuum cylinder E^2 where they are held by the inflowing air until the said cylinder has rotated to such an extent as to bring the laminæ to the free air box G, then the laminæ are released and fall as shown at T, Fig. 4, upon the moving table C^4, and as the said table moves, say in the direction of the arrow, the mass is carried along under the cement tank or trough L^3 and sprinkled with cement by the rotating brush L. This action continues until the table has reached the end of its motion in that direction and as it automatically stops, the sheet or plate of cemented laminated mass is removed by the operator and afterward subjected to any desired finishing process, such as pressing, drying, etc.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a machine of the class described, the combination of an inclined hopper formed with a foraminous bottom and an integral extension, means for agitating the hopper, a bed, means for receiving the charge from the integral extension of the hopper and depositing it upon the bed, and means for supplying an adhesive substance to the charge.

2. In a machine of the class described, the combination of a hopper formed with an inclined flat bottom the upper portion of which is foraminous while the lower portion is formed with an integral extension, means for receiving the foreign matter falling through the foraminous portion of the bottom of the hopper and carrying it away from the machine, a bed, means for receiving the charge from the integral extension of the hopper and depositing it upon the bed, means for agitating the hopper, and means for supplying an adhesive substance to the charge.

3. In a machine of the class described, the combination of a vacuum cylinder, means for delivering a charge to the vacuum cylinder, a free air chamber within the vacuum cylinder for releasing the charge therefrom, a bed receiving the charge released from the vacuum cylinder, and means for supplying an adhesive substance to the charge.

4. In a machine of the class described, the combination of a vacuum pipe, a vacuum cylinder journaled upon the pipe and in communication therewith, means for delivering a charge to the vacuum cylinder, a free

air chamber within the vacuum cylinder for releasing the charge therefrom, a bed receiving the charge released from the vacuum cylinder, and means for supplying an adhesive substance to the charge.

5. In a machine of the class described, the combination of a vacuum pipe, a vacuum cylinder journaled upon the vacuum pipe and in communication therewith, means for delivering a charge to the vacuum cylinder, a free air chamber arranged within the vacuum cylinder and supported upon the vacuum pipe for releasing the charge from the vacuum cylinder, a bed receiving the charge released from the vacuum cylinder, and means for supplying an adhesive substance to the charge.

6. In a machine of the class described, the combination of a bed, means for moving the bed, a carrier cylinder for feeding the charge to the bed, means for rotating the carrier cylinder, and means for automatically stopping the carrier cylinder when the bed reaches the limit of its movement.

7. In a machine of the class described, the combination of a bed, means for moving the bed, a carrier cylinder for feeding the charge to the bed, gearing for rotating the carrier cylinder, a lever controlling the gearing, and means upon the bed for engaging the lever to throw the gearing out of mesh when the bed reaches the limit of its movement.

8. In a machine of the class described, the combination of a reciprocating bed, gearing for driving the bed in either direction, a clutch for reversing the movement of the bed, means for automatically shifting the clutch when the bed reaches either limit of its movement, means for continuously supplying a charge to the bed during its movement in either direction, and means for applying an adhesive substance to the charge.

9. In a machine of the class described, the combination of a reciprocating bed, gearing for moving the bed in either direction, a clutch for reversing the movement of the bed, means for automatically shifting the clutch when the bed reaches either limit of its movement, a carrier cylinder for continuously feeding a charge to the bed during its movement in either direction, means for rotating the carrier cylinder, and means for automatically stopping the carrier cylinder when the bed reaches either limit of its movement.

10. In a machine of the class described, the combination of a bed, means for moving the bed, means for delivering a charge to the bed, a receptacle over the bed for receiving an adhesive substance, a brush for delivering the adhesive substance from the receptacle to the charge on the bed, and means for operating the brush when the bed moves in one direction, the brush being inoperative when the bed is moved in the other direction.

11. In a machine of the class described, the combination of a bed, means for reciprocating the bed back and forth, means for delivering a charge to the bed, a receptacle over the bed for receiving an adhesive substance, a shaft mounted to be driven by the movement of the bed, a brush having a pawl and ratchet connection with the shaft and serving to deliver the adhesive substance from the receptacle to the charge upon the bed, the said pawl and ratchet connection between the brush and the shaft causing the brush to remain inoperative when the bed is moving in one direction.

12. In a machine of the class described, the combination of a bed, means for reciprocating the bed back and forth, means for delivering a charge to the bed, a pair of troughs mounted over the bed, a rotatably mounted brush for each of the troughs, the said brushes serving to deliver the contents of the troughs to the charge as it is deposited upon the bed, and means for throwing the brushes alternately into operation, one of the brushes being in operation when the bed is moved in one direction, while the opposite brush is in operation when the bed is moved in the other direction.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWIN L. ELWELL.

Witnesses:
CHAS. F. HOWE,
FRANK G. PARKER.