(No Model.)

2 Sheets—Sheet 1.

O. E. WEBER.

MACHINE FOR COMPRESSING PULVERIZED SUBSTANCES.

No. 289,945. Patented Dec. 11, 1883.

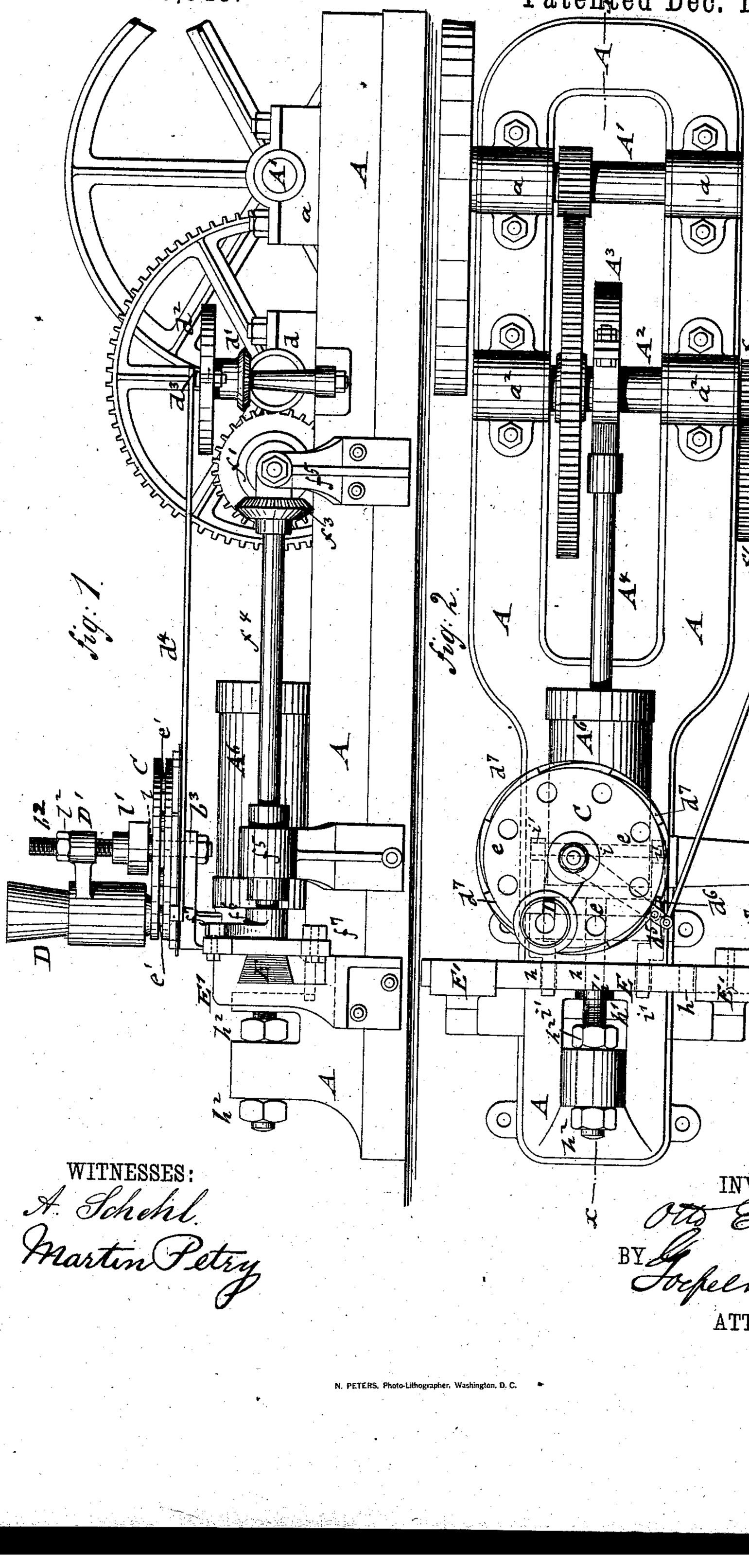

Fig. 1.

Fig. 2.

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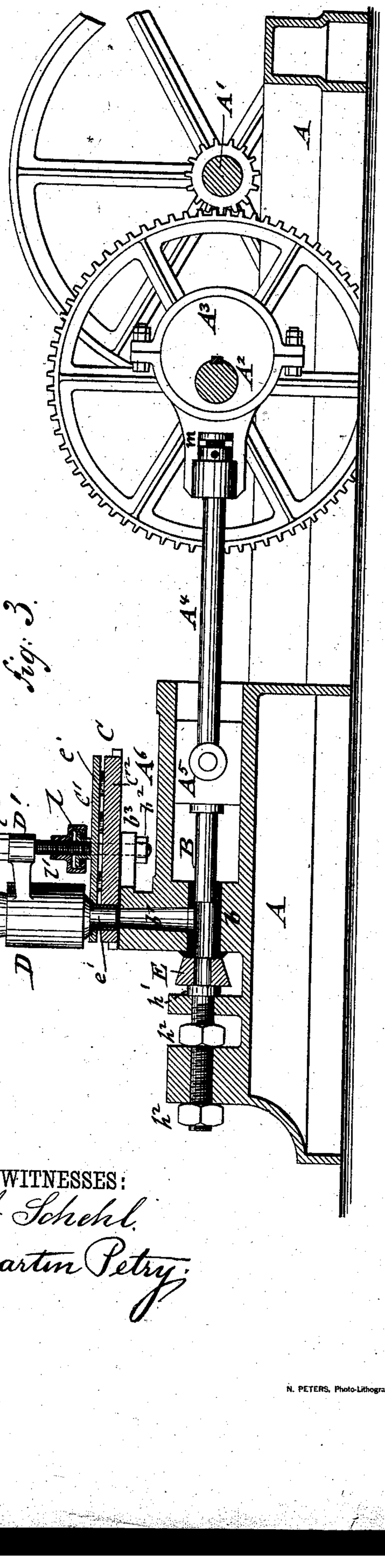

Fig. 3.

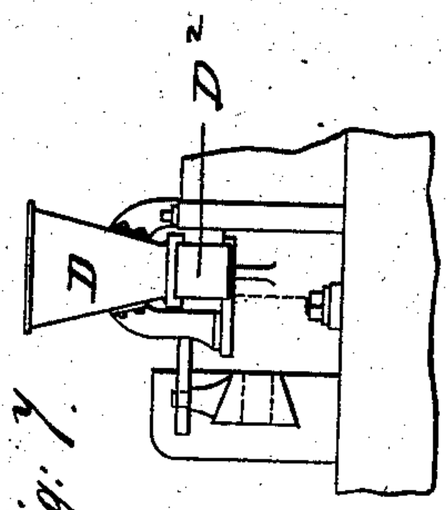

Fig. 7.

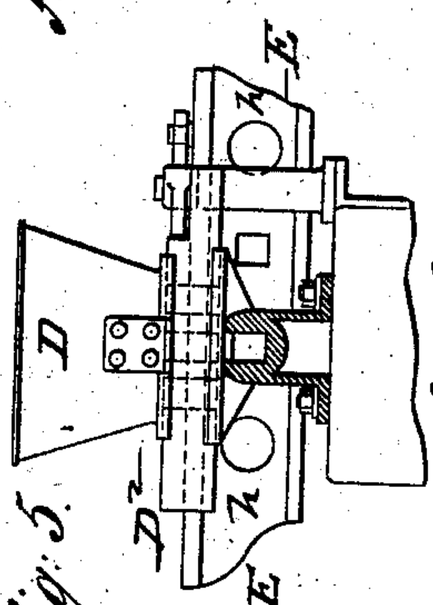

Fig. 5.

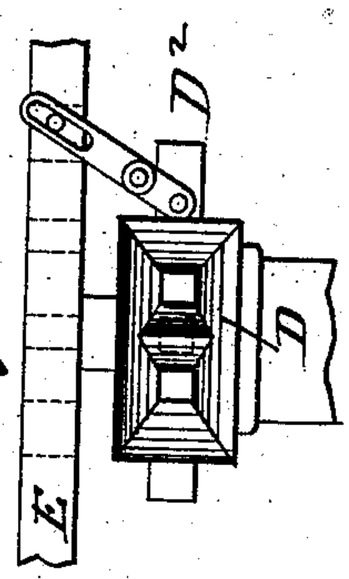

Fig. 6.

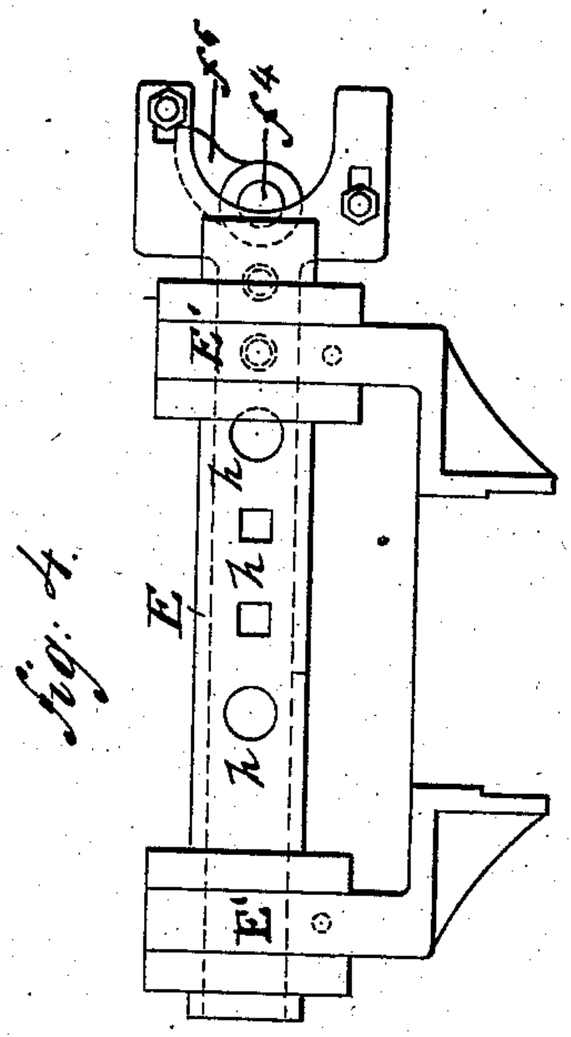

Fig. 4.

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UNITED STATES PATENT OFFICE.

OTTO E. WEBER, OF DRESDEN, SAXONY, GERMANY.

MACHINE FOR COMPRESSING PULVERIZED SUBSTANCES.

SPECIFICATION forming part of Letters Patent No. 289,945, dated December 11, 1883.

Application filed October 19, 1883. (No model.) Patented in France January 6, 1882, No. 146,715; in Germany July 18, 1882, No. 18,702, and in Austria-Hungary October 19, 1882, No. 23,699 and No. 42,021.

To all whom it may concern:

Be it known that I, OTTO E. WEBER, of Dresden, in the Kingdom of Saxony, Empire of Germany, have invented certain new and useful Improvements in Machines for Compressing Pulverized Substances, (for which Letters Patent have been granted to me heretofore by the government of France, dated January 6, 1882, No. 146,715; Germany, dated July 18, 1882, No. 18,702, and Austria-Hungary, dated October 19, 1882, No. 23,699 and No. 42,021,) of which the following is a specification.

This invention has reference to an improved machine for compressing pulverized substances into compact pieces of regular size; and the invention consists of a reciprocating plunger, a compression-cylinder connected to a supply-hopper, an intermittently-revolving supply-disk having filling-openings, said disk being made of two sections, one of which is vertically adjustable for changing the quantity to be compressed by each stroke of the plunger, mechanism by which the filling-disk is intermittently rotated so as to be brought above the supply-channel leading to the compression-cylinder, and a laterally-reciprocating slide-piece having compressing and clearing openings, and a fixed compression-block back of the slide-piece.

In the accompanying drawings, Figure 1 represents a side elevation; Fig. 2, a plan; and Fig. 3, a vertical longitudinal section on line *x x*, Fig. 2, of my improved machine for compressing pulverized substances. Fig. 4 is a detail side view of the laterally-reciprocating slide-piece; and Figs. 5, 6, and 7 are details showing a modified form of mechanism for supplying the regular quantities to be compressed.

Similar letters of reference indicate corresponding parts.

My improved machine is mounted on a substantial bed-plate, A, at one end of which is arranged, in suitable bearings, *a a*, a shaft, A′, which receives rotary motion by a belt-and-pulley transmission, and transmits it, by a pinion and gear-wheel, to a second transverse shaft, A^2, turning in bearings a^2 of the bed-plate A. On the second shaft, A^2, is located an eccentric, A^3, to the strap of which is adjustably applied a connecting-rod, A^4, as shown in Fig. 3. The opposite end of the connecting-rod A^4 is pivoted to a cross-head, A^5, that is guided in a cylinder, A^6. To the reciprocating cross-head A^5 is attached a plunger, B, that is guided in a contracted steel throat, *b*, at the opposite end of the cylinder. A vertical channel, *b′*, forms the communication between the steel throat *b* and a supply-disk, C, that is centrally pivoted to a fixed vertical screw-bolt, b^2, secured to a bracket, b^3, above the guide-cylinder A^6. Intermittent rotary motion is imparted to the supply-disk from the transverse shaft A^2 by means of bevel-gears *d d′*, which bevel-gears revolve a horizontal disk, d^2, at the upper end of the shaft of the gear-wheel *d′*. The wrist-pin d^3 of a connecting-rod, d^4, is adjustably applied to a radial slot of the disk d^2, the opposite end of the connecting-rod d^4 being pivoted to a radial arm, d^5, that swings on the center post, b^2, of the supply-disk D. The radial arm d^5 carries a spring-pressed pawl, d^6, that takes into teeth d' at the circumference of the supply-disk. Each revolution of the disk d^2 moves the supply-disk C forward for the distance of one tooth and returns the pawl d^6, so as to engage the next tooth. The supply-disk C is provided with as many holes *e e* as there are ratchet-teeth in the circumference, which holes are placed successively below a supply-hopper, D, into which the material to be compressed is placed. The supply-hopper D is located at one side of the longitudinal axis of the machine at the same distance from the center bolt of the disk C as the supply-holes, so that while the hole *e* immediately below the hopper is filled with material, the next adjoining hole that has been filled is vertically above the channel *b′* and discharging its contents into the same. The holes of the supply-disk C are filled as they move successively past the supply end of the hopper D, and discharge their contents into the compression-throat *b*, to be acted upon by the plunger B. The shaft A^2 transmits, also, by gear-wheels *f f′* and intermediate bevel-gear, f^2 f^3, rotary motion to a shaft, f^4, that is supported by bracket-bearings f^5 parallel to the

longitudinal axis of the machine, and provided at its outer end with a crank, f^6, which engages alternately contact-stops f^7 f^7 of the forked end of a laterally-reciprocating slide-piece, E, that is guided in dovetailed supporting-brackets E′, secured to the bed-plate A. The contact-stops f^7 f^7 are adjustable in horizontal slots of the forked end of the slide-piece, so that the exact degree of laterally-reciprocating motion is imparted to the slide-piece by the crank f^6. The slide-piece E is provided with four openings, *h h*, of the size of the cakes into which the material is to be compressed. At each forward stroke of the plunger B the material dropped into the compression-throat *b* is compressed in one of the holes *h h*, in connection with a fixed press-block, *h′*, the shank of which is rigidly applied by screw-nuts h^2 to end blocks of the bed-plate A. The cross-head A^5 of the plunger B carries on a transverse arm, *i*, (shown in dotted lines in Fig. 2,) at the outside of the guide-cylinder A^6, clearers *i′ i′*, which are parallel to the plunger, and at a distance from the same equal to that between the holes *h h*. The clearers *i′ i′* are long enough to pass entirely through the holes *h h* and push out the material compressed therein. While the plunger compresses the material in one of the holes *h h* at each forward stroke, the clearer *i′* at one side of the same pushes the compressed material out of the adjoining hole, and the clearer at the opposite side passes through an empty hole, *h*. This is repeated with each laterally-reciprocating motion of the slide-piece, as the holes of the same are brought into line with the plunger B and clearers *i′ i′* before the stroke of the same.

The supply-disk C is made of two sections, which are both provided with holes *e e*, that are vertically in line with each other. The holes *e e* of the upper section, C′, are provided with fixed cylindrical sleeves *e′*, that extend downward and fit into the openings of the lower section, C^2, as shown clearly in Fig. 3. The upper section, C′, is vertically movable by being connected at its center with a flanged hub, *l*, that is engaged by a flanged screw-nut, *l′*, which is capable of vertical adjustment on the upright center post, b^2, so that the upper disk-section, C′, can be raised or lowered, and thereby the supply-openings *e e* of the disk-sections C′ C^2, by the extension-sleeves *e′ e′*, be made longer or shorter, according as a larger or smaller quantity of material is desired to be compressed at each stroke of the plunger.

The supply-hopper D is connected by a bracket-arm, D′, to the screw-post b^2, and adjusted vertically thereon, the bottom edge of the supply-hopper D forming contact with the upper section of the supply-disk C by the pressure of a screw-nut, l^2, above the sleeve of the bracket-arm D′, as shown in Figs. 1 and 3.

The material to be compressed is conveyed to the supply-hopper in any suitable manner, and discharged from the same into the holes of the supply-disk, the intermittent rotary motion of which cuts off the supply and conveys the material to the vertical channel *b′*, that increases in width toward its lower end, and conveys the material into the compression-throat *b*, as shown in Fig. 3.

In place of the intermittently-rotating supply-disk C, a horizontal and laterally-reciprocating slide-piece, D^2, may be substituted, which is shown in Figs. 5, 6, and 7. In this case the slide-piece E is connected by a fulcrumed and slotted lever with the filling slide-piece D^2, that is reciprocated below the supply-openings of the centrally-partitioned supply-hopper D. When one of the openings of the filling slide-piece is below the partition, it is in a position to discharge the material into the vertical conveying-channel *b′*, which leads to the compression-cylinder, where it is there compressed into one of the compression-openings *h* of the laterally-reciprocating slide-piece E.

The degree of compression of the plunger B may be regulated by a screw-nut, *m*, at the point where the connecting-rod A^4 is applied to the strap of the eccentric A^3, whereby the stroke of the plunger is lengthened or shortened, and thereby a greater or smaller degree of compression of the material produced.

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

1. The combination of a supply-hopper, a supply-disk having openings below the same, means for intermittently rotating the supply-disk, a vertical conveying-channel, a horizontal compression-throat, a longitudinally-reciprocating plunger, a laterally-reciprocating slide-piece having compression-openings, and a fixed compression-block back of the slide-piece and in line with the plunger, substantially as and for the purpose set forth.

2. The combination of a guided and laterally-reciprocating slide-piece, having compression-openings, with a compression-throat and a longitudinally-reciprocating plunger at one side and a fixed compression-block at the other side of the slide-piece, substantially as set forth.

3. In a machine for compressing pulverized substances, the combination of a vertically-adjustable supply-hopper, an intermittently-rotating supply-disk composed of an upper and a lower disk-section, both having supply-holes, the holes of the upper disk-section having fixed sleeves extending into the holes of the lower section, and means for vertically adjusting the upper disk-sections, so as to enlarge or decrease the size of the supply-holes, substantially as set forth.

4. The combination of a supply-hopper, a supply-disk having supply-holes, means for intermittently rotating the supply-disk, a

vertical conveying-channel, a horizontal compression-throat, a longitudinally-reciprocating plunger, reciprocating clearers actuated simultaneously with the plunger, a laterally-guided slide-piece having compression-openings, means for reciprocating said slide-piece, and a fixed compression-block back of the slide-piece and in line with the plunger, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

OTTO E. WEBER.

Witnesses:
LÉON KLEMPERER,
PAUL DURCKMÜLLER,
Both of Dresden.