(No Model.) 2 Sheets—Sheet 1.

J. S. COWDERY, H. J. CURTIS & E. L. LIEDKE.

CRAYON MACHINE.

No. 476,038. Patented May 31, 1892.

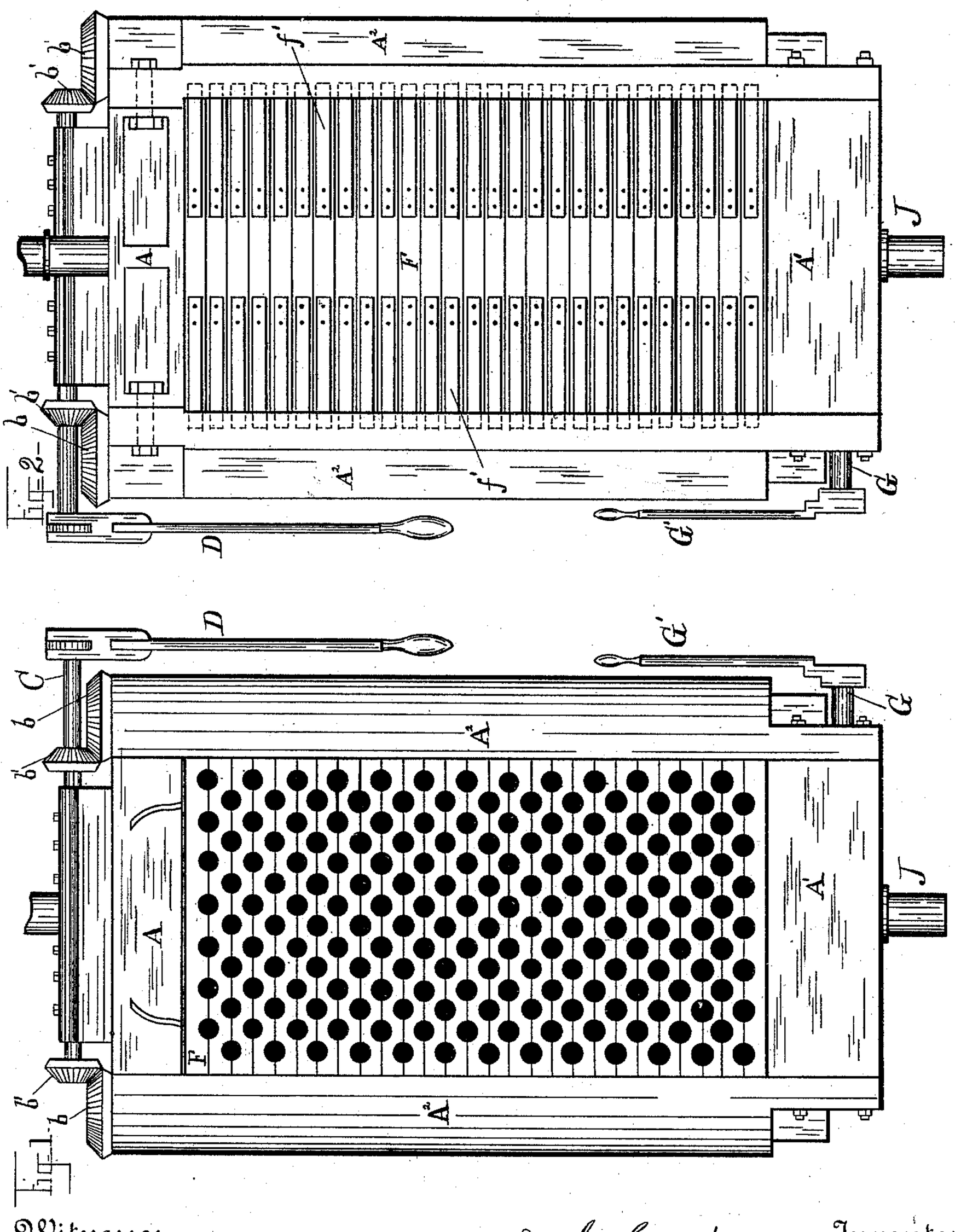

Fig. 2.

Fig. 1.

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Fig 3.

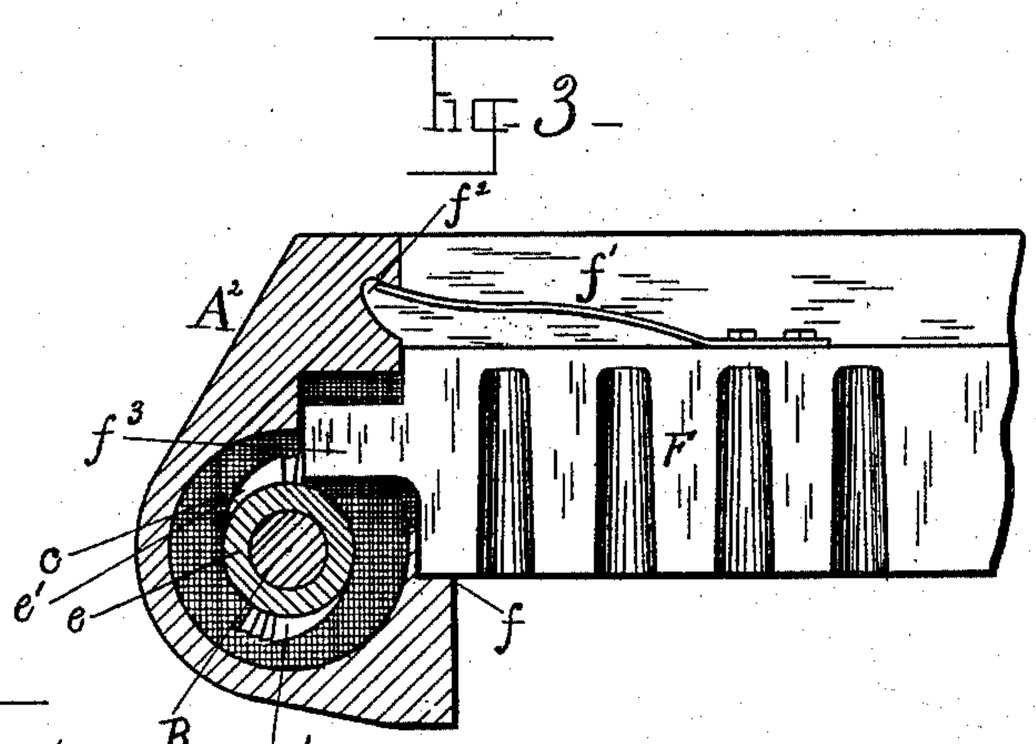


Fig 4.

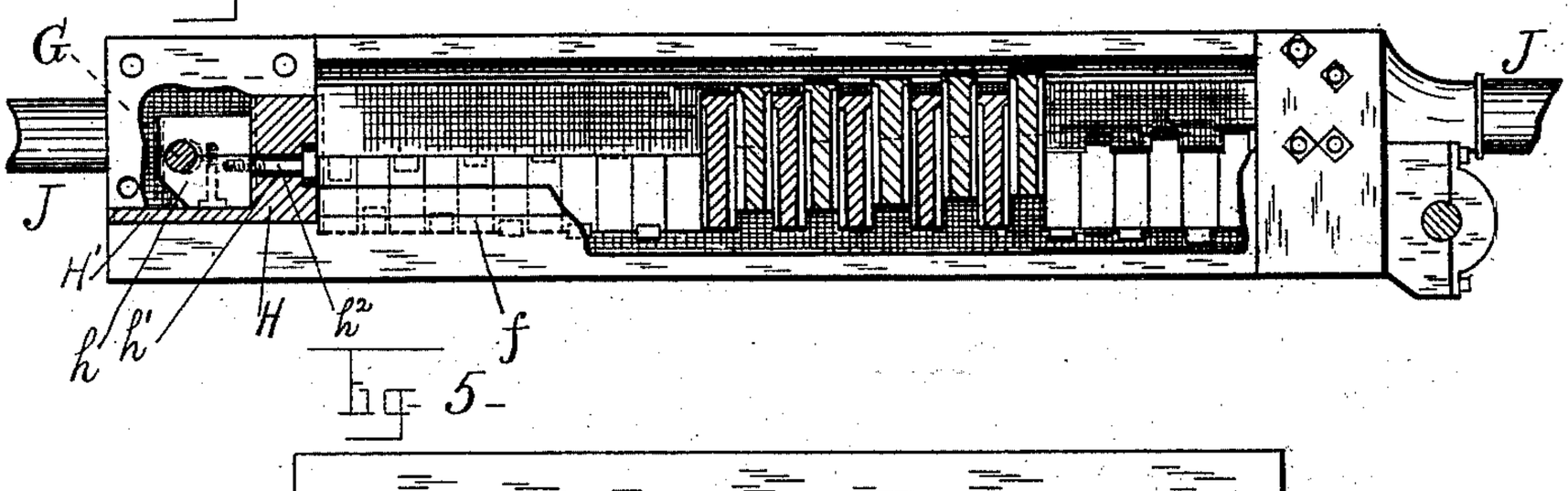


Fig 5.

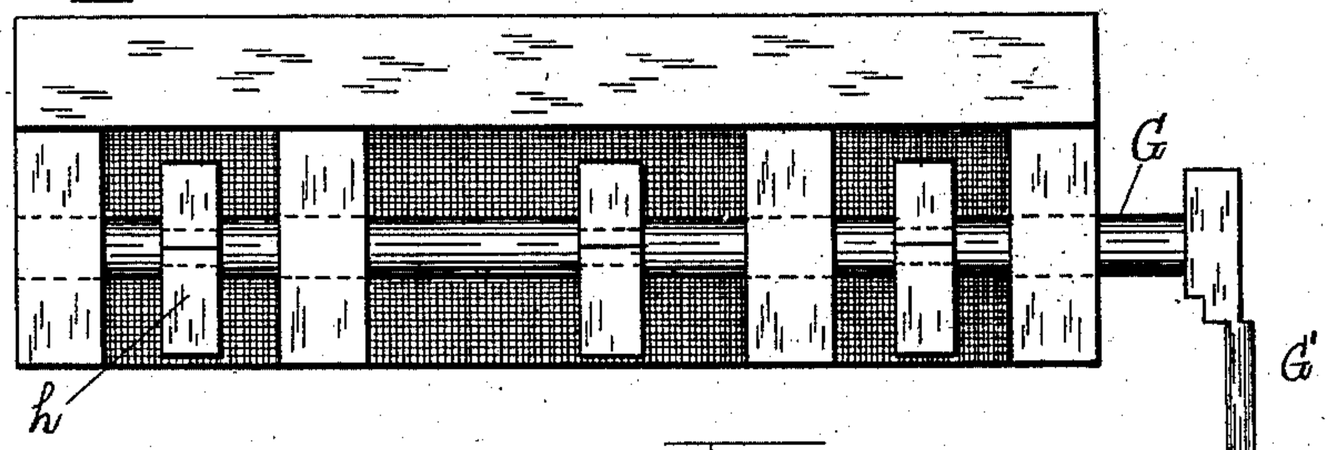


Fig 6.

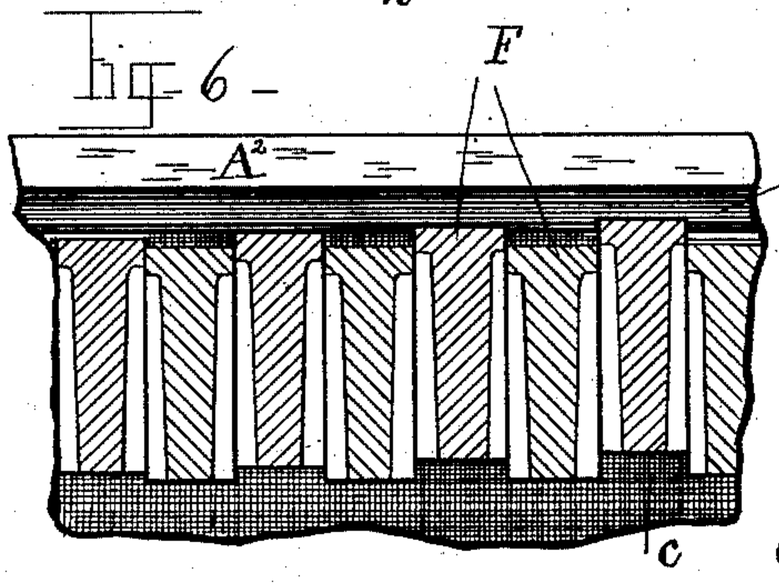
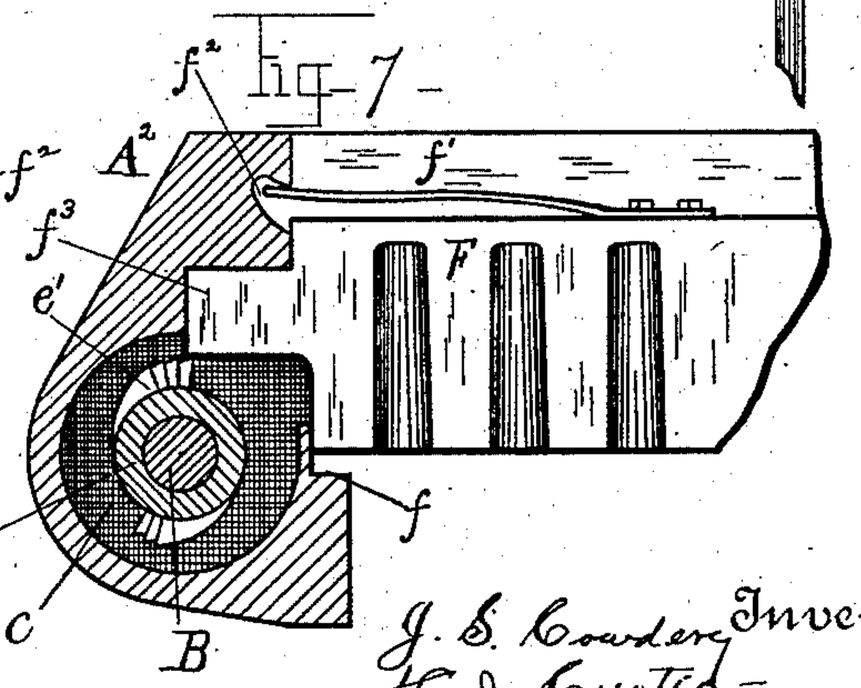


Fig 7.



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UNITED STATES PATENT OFFICE.

JOHN S. COWDERY, HOWARD J. CURTIS, AND EDWARD L. LIEDKE, OF SANDUSKY, OHIO; SAID CURTIS AND LIEDKE ASSIGNORS TO SAID COWDERY.

CRAYON-MACHINE.

SPECIFICATION forming part of Letters Patent No. 476,038, dated May 31, 1892.

Application filed January 17, 1889. Renewed December 16, 1889. Serial No. 333,841. (No model.)

To all whom it may concern:

Be it known that we, JOHN S. COWDERY, HOWARD J. CURTIS, and EDWARD L. LIEDKE, citizens of the United States, and residents of Sandusky, county of Erie, and State of Ohio, have invented certain new and useful Improvements in Crayon-Machines, of which the following is a specification, the principle of the invention being herein explained and the best mode in which we have contemplated applying that principle, so as to distinguish it from other inventions.

The leading features of this invention comprise mechanism which operates the mold-plates in an upward and downward movement, said mold-plates having downwardly-discharging mold formation, the arrest of such downward movement adapted to cause the loosening or discharge of the crayons and spring mechanism which causes the said mold-plates to descend in their said downward movement with speed and force over their gravity tendency, so as to insure certainty in the loosening or discharge of the crayons.

Referring to the drawings, Figure 1 is a plan view of the upper side of the mold-plate frame complete, the molds on account of the greatly-reduced scale of the drawings and for the sake of greater perspicuity and clearness being shown as alternating one with the other, though in practice we preferably make them exactly opposite one another on each side of the plates, thus forming a perfect line of space between the rows of holes each way, as shown in the sectional mold-plates, Figs. 4 and 6. Fig. 2 is a plan view of the reverse side of the mold-plate frame complete. Fig. 3 is a transverse sectional view through the barrel, showing a portion of the mold-plate in lowered position. Fig. 4 is an inside face elevation of a barrel, the end portions of the frame being also shown, certain portions being sectioned away and certain sectional portions of the mold-plates being shown in position within the barrel, the shaft below the sectional mold-plates and the cams engaging with the same being omitted for the sake of clearness. Fig. 5 is an inner end elevation of the back end portion of the frame, showing the eccentric shaft journaled therein and the brasses secured to the shaft. Fig. 6 is an elevation of a portion of a barrel, all parts engaging with the mold-plates shown therein or that would obscure the view of the said mold-plates being sectioned away or omitted, the cams adjacent to said shown mold-plates and the shaft on which they are secured being omitted, among other things. Fig. 7 is a view of the same parts shown in Fig. 3, the mold-plate being in raised position.

The mold-plate frame is composed of the end portions A A′ and the recessed side portions or barrels A^2, to which said end portions are secured. Journaled longitudinally in the ends of each barrel is the shaft B. Secured to the outer extremity of each shaft are the bevel-gears *b*, that respectively mesh with bevel-pinions *b′*, secured to shaft C, said latter shaft being journaled transversely of the mold-plate frame on the outer side of the end portion A. Ratchet-lever D is removably fitted on the extremity of shaft C, and by this means said shaft is rotated and motion thereby imparted to bevel-gears *b* and the shafts to which they are respectively secured.

Within the recess *c* of the respective barrels and rigidly secured to each shaft B are the rows of cams *e*, with their projecting portions *e′* located on a pitch or spirally along the shaft. The said cams on each shaft are divided into two series, the respective cams of the two series being located intermediately of one another, every cam having its projecting portion substantially on the diametrically-opposite side of the shaft to the projecting portion of the adjacent cam—that is, every other cam has its projecting portion on one side of the shaft and the intermediate cams have their projecting portions on the opposite side of the shaft. In other words, the projecting portion of one cam is in every instance in proximity to the retreated or depressed portion of the adjacent cam, taken on a plane transversely through the different cams. The projecting portion of any cam on one shaft is located in the same vertical plane and also in the same horizontal plane with the projecting portion of the corresponding or companion cam on the shaft in the opposite barrel. Thus as the two shafts are operated by the same mechanism they are caused to rotate synchronously one with the other, and the

companion cams respectively on said shafts likewise rotate synchronously. Each barrel has formed longitudinally on its inner side the ledge or shoulder *f*, on which rest the respective extremities of mold-plates F when the latter are in lowered position.

Bolted to each extremity of the closed edge of each mold-plate is the spring *f'*, having its free extremity engaging with the wall of the longitudinal slot f^2, formed on the inner side of the barrel. The respective shoulders f^3 of the mold-plate have engagement with the projecting portions of the contiguous cams, and the mold-plate is thereby raised in a vertical plane as the cams are rotated.

Cast integral with follower H, described below, is apron H', said apron covering and protecting the eccentric shaft and brasses, described at length below, and also protecting the connectingparts. Said apron normally rests on a level with the upper edge of the mold-plates, thus forming a perfect surface for conducting away any surplus material from the molds after filling and also protecting the working parts of the follower from exposure. The springs are straightened and compressed as the cams raise any one mold-plate, and as the latter drops off the projections of the cams the weight of the mold-plate, together with the pressure of the spring, causes the mold-plate to be forced downwardly until it strikes the ledges or shoulders *f*, which suddenly arrest the downward descent of the mold-plate and insure the discharge of the crayons from the molds.

An eccentric shaft G is journaled in the end portion A' of the frame and is provided on its extremity with lever G'. Brasses *h* are severally secured to said shaft, and bolted to said brasses is the movable follower H, that extends lengthwise of the end portion A'. Said follower is provided with slotted opening *h'*, that permit certain freedom of movement to bolts h^2, which secure the follower to the respective brasses. As the lever is moved the eccentric shaft transmits movement to the respective brasses, and thence to the follower, the latter being thus forced against the adjacent mold-plate or retracted therefrom.

Suitable gudgeons J are cast integral with the respective end portions A A', by means of which the frame may be journaled, so as to be rotated and turned as the operation of the machine may require.

Each mold-plate is provided with fractional molds that register with similar fractional molds in the adjacent mold-plate and together form complete molds.

The operation of the machine is as follows: Let it first be understood that the mold-plate frame is journaled up in any suitable reel. The eccentric shaft G is by means of the lever G' partially rotated, so as to cause the brasses to force the follower against the last and adjacent mold. This causes the mold-plates to be tightly crowded against each other. The molds are then suitably filled with the liquid material of which the crayons are to be formed, and said material is allowed to "set" in the molds, so as to form the hardened crayons. When it is desired to remove the crayons, the mold-plate frame is given a semi-rotation, bringing the springs on the upper side, as shown in Fig. 2. The follower is retracted by movements reverse to that described, and the mold-plates are thus afforded certain play of movement sufficient to relieve the friction of one against another. By means of the ratchet-lever D the transverse shaft C and the longitudinal shafts B and the cams secured thereto are rotated, causing the mold-plates to be raised by their engagement with said cams. As the cams are arranged spirally or with a pitch along the shaft and every other cam has its projecting portion on opposite sides of the shaft from the alternate cam, every other mold-plate, or we may call them the "alternate" mold-plates, is gradually raised one after another by said cams, and as the mold-plates drop off the projections of the cams their descent is hastened by the force of the springs exerted downward in opposition to the cams and in conjunction with the weight of the mold-plates. As the mold-plates descend they strike with force against the ledges *f* and the crayons are forced out. On the succeeding half-rotation of the shaft the operation is repeated with the remaining mold-plates that are intermediate of the set first raised.

The foregoing description and accompanying drawings set forth in detail mechanism in embodiment of our invention. Change may be made therein, provided the principles of construction respectively recited in the following claims are employed.

We therefore particularly point out and distinctly claim as our invention—

1. In a machine for making crayons, carpenters' chalk, or other like articles, the combination of an upwardly and downwardly movable mold-plate having downwardly-discharging mold formation with an actuating-cam, said cam engaging with said mold-plate and thus raising it and then disengaging itself therefrom, substantially as set forth.

2. In a machine for making crayons, carpenters' chalk, or other like articles, the combination of an upwardly and downwardly movable mold-plate having downwardly-discharging mold formation with an actuating-cam, said cam located out of vertical line with said mold formation and having alternate engagement with and disengagement from said mold-plate, substantially as set forth.

3. In a machine for making crayons, carpenters' chalk, or other like articles, the combination of a mold-plate whose mold formations discharge downwardly and two rotary cams respectively engaging with the under sides of the opposite ends of said mold-plate, substantially as set forth.

4. In a machine for making crayons, carpenters' chalk, or other like articles, the com-

bination of an upwardly and downwardly movable mold-plate whose mold formations discharge downwardly, movable cam mechanism engaging beneath said mold-plate, and a spring which presses down upon said mold-plate, substantially as set forth.

5. In a machine for making crayons, carpenters' chalk, or other like articles, the combination, with mold-plates relatively independent and respectively provided with fractional molds conjointly forming complete molds having downward discharge, of rotary cams relatively independent and respectively engaging beneath the ends of said mold-plates, said cams having springs relatively independent and respectively exerting downward pressure on the ends of said mold-plates, substantially as set forth.

6. In a machine for the manufacture of crayons, carpenters' chalk, or other like articles, the combination, with a number of cams, the projecting portion of one cam alternating with the depressed portion of the next cam, of a number of mold-plates respectively having engagement with said cams, substantially as set forth.

7. In a machine for the manufacture of crayons, carpenters' chalk, or other like articles, the combination of a series of mold-plates and two rows of cams respectively engaging with opposite extremities of the mold-plates, the projecting portions of the cams of each row being located out of horizontal line with each other, substantially as set forth.

8. In a machine for the manufacture of crayons, carpenters' chalk, or other like articles, the combination of a series of mold-plates, a mold-plate frame, and two series of cams located at the same side of the frame, the cams of each series engaging, respectively, with the extremities of the mold-plates and having their projecting and depressed portions respectively alternating with each other, the alternate projecting portions of each series of cams being on an axial pitch with respect to each other, substantially as set forth.

9. In a machine for the manufacture of crayons, carpenters' chalk, or other like articles, the combination of a mold-plate frame provided on its opposite sides with shoulders, a series of mold-plates having their opposite extremities engaging with said shoulders, and two rows of rotary cams respectively engaging with opposite extremities of said mold-plates, the projecting portions of alternate cams of each row being located spirally on a pitch with respect to each other, the projecting portions of companion cams of the two rows being located substantially in the same horizontal plane, substantially as set forth.

10. In a machine for the manufacture of crayons, carpenters' chalk, or other like articles, the combination of a series of mold-plates, a mold-plate frame provided with opposite recessed side portions, rotary shafts extending longitudinally in said side portions, said shafts provided with cams engaging with the opposite extremities of the respective mold-plates, and mechanism intermediately connecting said shafts, whereby they are caused to rotate synchronously, substantially as set forth.

11. In a machine for making crayons, carpenters' chalk, or other like articles, the combination of a series of mold-plates having end shoulders, a mold-plate frame having its sides provided with recesses in which said shoulders loosely fit, and cam mechanism located within said recesses, said shoulders resting on said cam mechanism and having reciprocating movement up and down within said recesses, substantially as set forth.

12. In a machine for making crayons, carpenters' chalk, or other like articles, the combination of mold-plates, a mold-plate follower, follower-actuating mechanism, and an apron connected with said follower and extending over said follower-actuating mechanism, substantially as set forth.

In testimony that we claim the foregoing to be our invention we have hereunto set our hands this 12th day of January, A. D. 1889.

JOHN S. COWDERY.
HOWARD J. CURTIS.
EDWARD L. LIEDKE.

Witnesses to the signatures of John S. Cowdery and Howard J. Curtis:

CHARLES W. SADLER,
FRANCIS RAYMOND.

Witnesses to the signature of Edward L. Liedke:

CHARLES W. SADLER,
GEO. W. DANIEL, Jr.