H. SCHMIDT.

MACHINE FOR STAMPING CONCRETE BLOCKS AND THE LIKE.

APPLICATION FILED FEB. 3, 1908.

921,287.

Patented May 11, 1909.

5 SHEETS—SHEET 1.

Fig. 1.

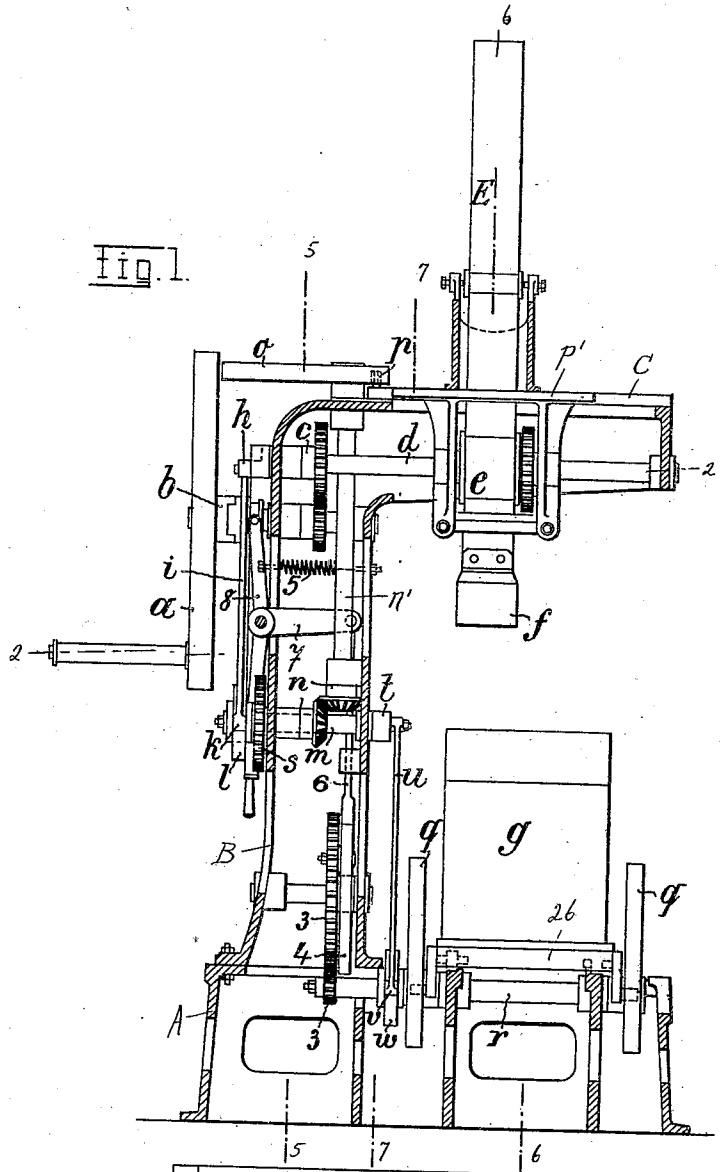
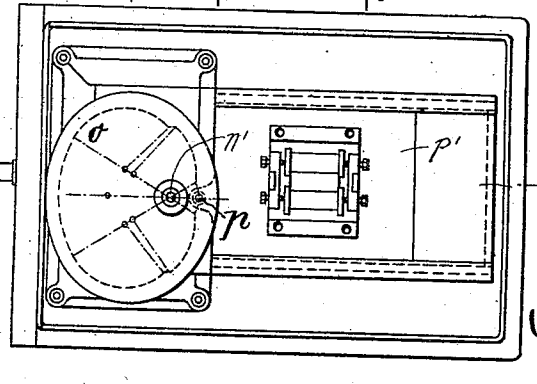


Fig. 2.



Witnesses.
E. E. Johnson
J. A. Moore

Inventor.
Hugo Schmidt
By Whittaker & Prevost
Attys.

THE NORRIS PETERS CO., WASHINGTON, D. C.

H. SCHMIDT.

MACHINE FOR STAMPING CONCRETE BLOCKS AND THE LIKE.

APPLICATION FILED FEB. 3, 1908.

921,287. **Patented May 11, 1909.**

5 SHEETS—SHEET 2.

Fig. 3.

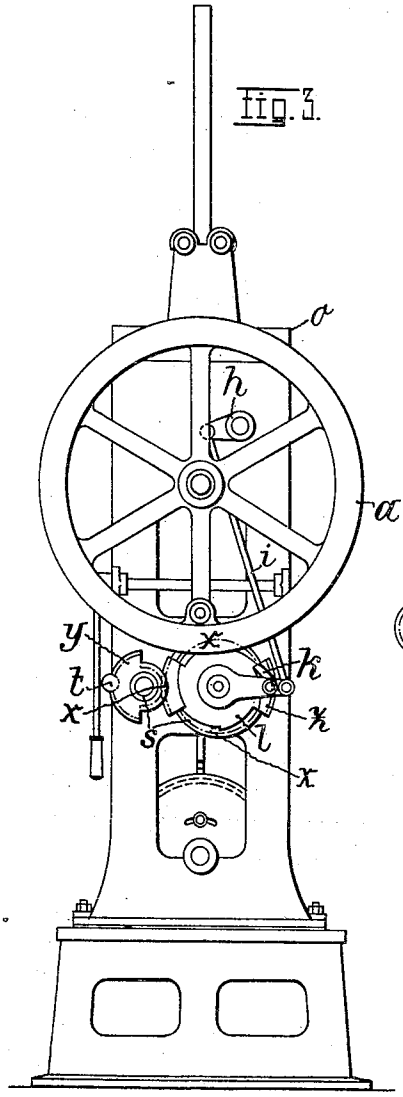


Fig. 4.

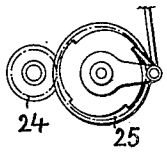
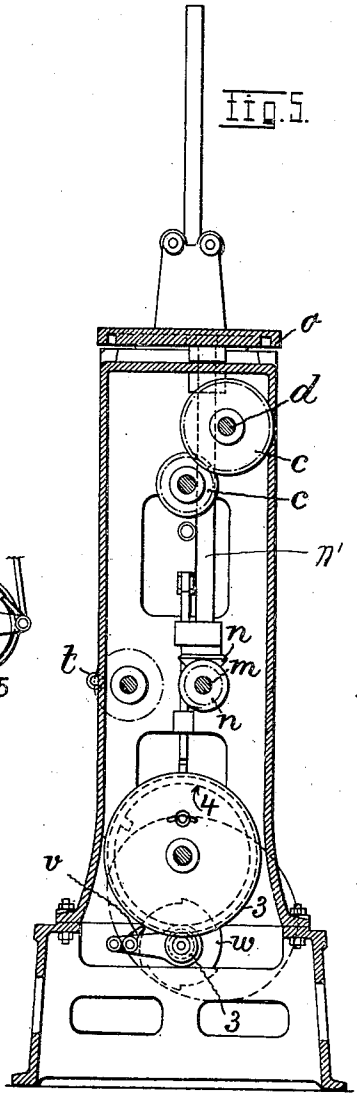


Fig. 5.



Witnesses.
E. E. Johansen
J. K. Moore

Inventor.
Hugo Schmidt.
By Whittaker & Prevost
Attys.

THE NORRIS PETERS CO., WASHINGTON, D. C.

H. SCHMIDT.

MACHINE FOR STAMPING CONCRETE BLOCKS AND THE LIKE.

APPLICATION FILED FEB. 3, 1908.

921,287.

Patented May 11, 1909.

5 SHEETS—SHEET 3.

Fig. 6.

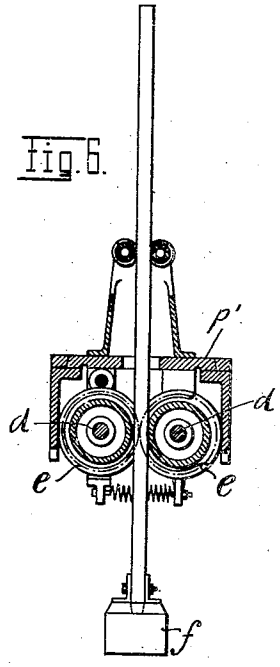
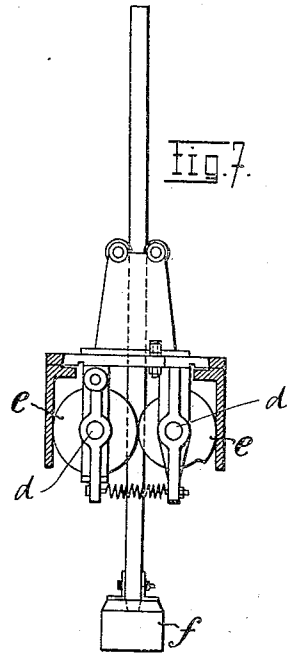
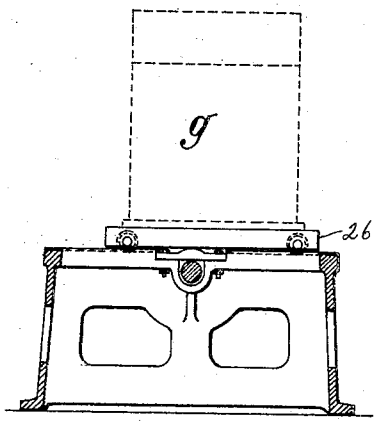
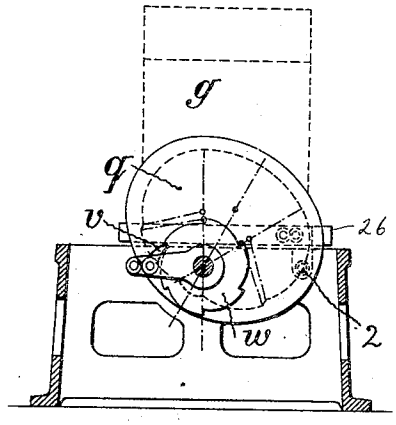


Fig. 7.







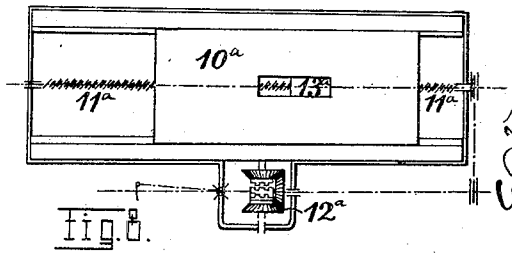


Fig. 8.

Witnesses.
E. E. Johansen
J. K. Moore

Inventor.
Hugo Schmidt
By Whittaker & Prevost
Attys.

THE NORRIS PETERS CO., WASHINGTON, D. C.

H. SCHMIDT.

MACHINE FOR STAMPING CONCRETE BLOCKS AND THE LIKE.

APPLICATION FILED FEB. 3, 1908.

921,287.

Patented May 11, 1909.

5 SHEETS—SHEET 4.

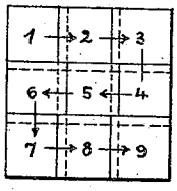


Fig. 9.

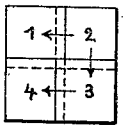


Fig. 10.

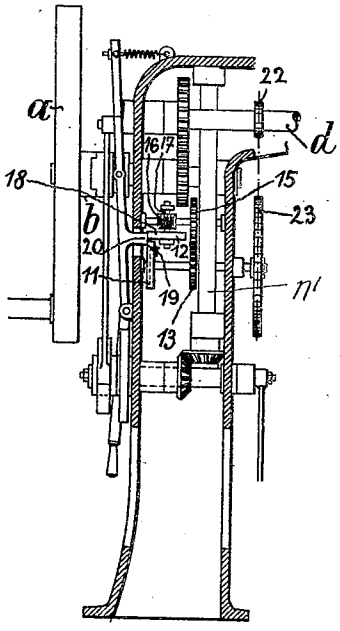


Fig. 11.

Witnesses.
E. E. Johansen
J. K. Moore

Inventor.
Hugo Schmidt.
By Whittemore Wilcox
Attys

THE NORRIS PETERS CO., WASHINGTON, D. C.

H. SCHMIDT.

MACHINE FOR STAMPING CONCRETE BLOCKS AND THE LIKE.

APPLICATION FILED FEB. 3, 1908.

921,287. **Patented May 11, 1909.**

5 SHEETS—SHEET 5.

Fig. 12.

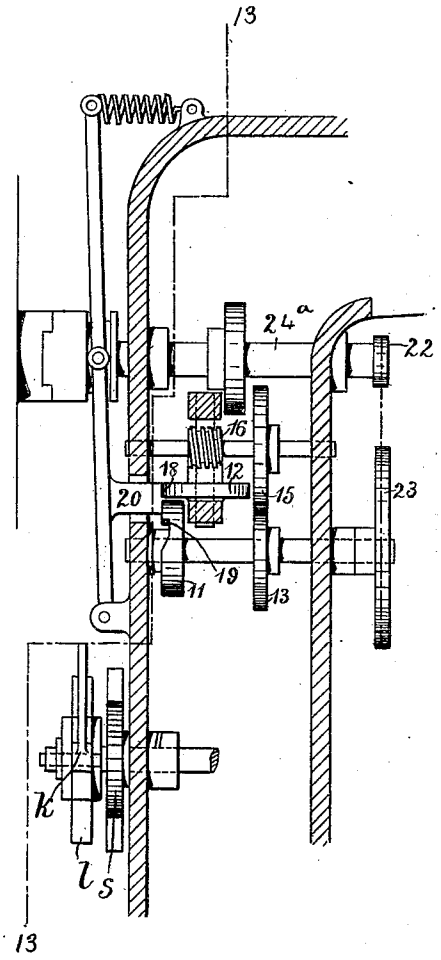
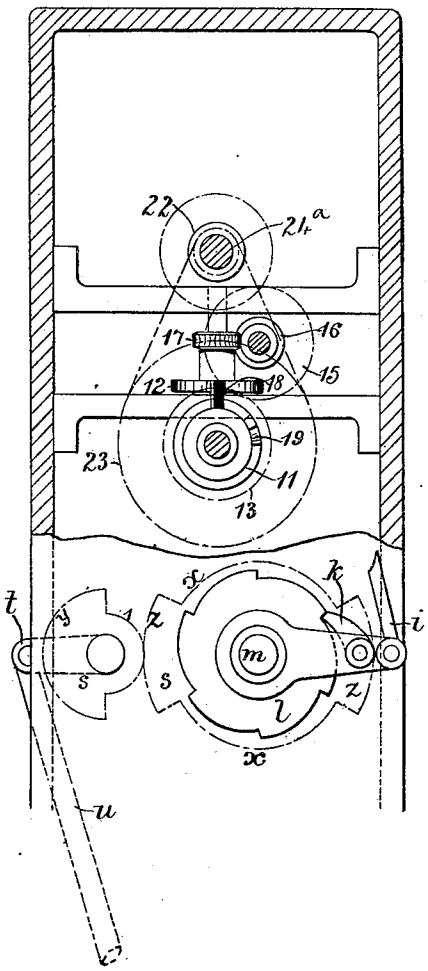


Fig. 13.



Witnesses.

J. K. Moore

R. E. Barry

Inventor.

Hugo Schmidt

By Whittaker & Prevost

Attys.

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HUGO SCHMIDT, OF CHARLOTTENBURG, GERMANY.

MACHINE FOR STAMPING CONCRETE BLOCKS AND THE LIKE.

No. 921,287. Specification of Letters Patent. Patented May 11, 1909.

Application filed February 3, 1908. Serial No. 414,104.

To all whom it may concern:

Be it known that I, HUGO SCHMIDT, a subject of the German Emperor, residing at No. 2 Suarezstrasse, Charlottenburg, Germany, have invented a new and useful Machine for Stamping Concrete Blocks and the Like, of which the following is a specification.

My invention relates to a machine for stamping test blocks of concrete and the like whereby the voluntary and involuntary effects of stamping by hand are eliminated, these being (1) the height of fall, (2) the point at which the die strikes, (3) the number of blows, all of which must be exactly determined. To this end the machine is so constructed that (1) the die always falls freely from the same height upon the mass of concrete contained in the mold, (2) the table carrying the mold, and the die, which are automatically shifted intermittently with reference to each other so that the separate areas to be struck lie in straight lines at equal distances, overlap mutually to a certain extent, and are brought under the die in recurring succession, and finally, (3) after a number of blows, which is capable of exact regulation, the driving mechanism is compulsorily and instantly thrown out of gear.

For obtaining the relative movements of the die and the table upon each other, as described in paragraph 2 above, three forms of construction are available. Either (1) both can be moved in directions which lie at right angles to one another, or (2) the table alone or (3) the die alone executes these two movements at right angles to each other, while the other member stands still.

In the accompanying drawings which show one form of a machine or apparatus embodying my invention, Figure 1 is a longitudinal vertical section of the machine on line 1—1 of Fig. 2. Fig. 2 is a horizontal section on line 2—2 of Fig. 1. Fig. 3 is a front elevation of the machine. Fig. 4 is a detail of part of the mechanism. Fig. 5 is a vertical transverse section of the machine in line 5—5 of Fig. 1. Fig. 6 is a vertical transverse section on line 6—6 of Fig. 1, the die rod being shown in elevation. Fig. 7 is a vertical transverse section on line 7—7 of Fig. 1. Fig. 8 is a plan view of a table suitable for making longer beam shaped bodies. Figs. 9 and 10 are diagrammatic views showing the travel of the die and block with respect to each other. Fig. 11 is a sectional view of a portion of the machine. Fig. 12 is a sectional view drawn to a larger scale, of parts of the mechanism illustrated in Fig. 11. Fig. 13 is a sectional view on line 13—13 of Fig. 12.

In the arrangement shown in the drawings the die is so moved in one direction and the table in the other that the points struck lie in the positions prescribed, as shown in Figs. 9 and 10. When the clutch coupling b and the pair of toothed wheels c are thrown into gear, the shaft d is driven from the fly-wheel a. This shaft turns two friction rollers e connected by toothed wheels, and which raise the die f to a height of 25 cm. at each revolution of the shaft, and afterward allow it to fall upon the cement in the mold g. The shaft d, further, through the crank h, the connecting rod i, the pawl k, the ratchet wheel l the spindle m, and the bevel gearing n rotates the vertical shaft n' which turns the cam o to the extent of 60° at each complete revolution of the shaft, *i. e.* after each blow of the die. The cam o has on its lower surface a curved groove running around it, under which passes the roller p attached to the slide p' of the dropping mechanism. The middle line of this groove is shown dotted in the plan, Fig. 2. After the first blow of the die, the slide p' is moved to the right by the roller running in the lifting cam to the extent of the breadth of the die 8.5 cm., and again after the second blow. After the third blow the slide p' remains stationary, because the portion of the cam then passing over the roller is an arc of a circle concentric with the axis of rotation. After the fourth, and again after the fifth blow the slide is moved to the left again and back into the original position, in which it remains stationary after the sixth blow. Thereupon the process begins again. It is necessary as is obvious that the molding table 26 after the three blows of the first series have been struck, and while the die slide is stationary, in its extreme position, should be moved in a direction at right angles to the movement of the die to an extent equal to the breadth of the die, so that the latter may be able to execute the second series of blows in its return journey. The molding table 26 must also again be similarly moved so that the third row comes under the die. When this has been done all the nine points struck must come under the die again in the inverse order, in course of which, it is of course necessary that the table shall again remain stationary in the third position while the fourth trio of blows is struck.

The motion of the table 26 above described is effected by a cam q similar to the one already described, which is caused to rotate through 60° at a time by the shaft m acting through the sector wheels s, the crank t, the connecting rod u, the pawl v and the ratchet wheel w. The rotation of the two sector wheels s is effected by that of the ratchet wheel l which is secured with one sector wheel s (of which the arc $x = 120°$) upon the shaft m and is in engagement with the other sector wheel s (in which the arc $y = 180°$) see Figs. 1, 3, 12 and 13. The latter is fixed upon the same shaft as the crank t which shaft through the medium of a rod u acts upon the ratchet wheel w. During two movements of the die f the ratchet wheel l rotates through $60° \times 2 = 120°$. This rotation is made use of to lift the pawl v. Since the arc x of 120° of the one sector wheel coöperates with the arc y of 180° of the other sector wheel, the radii of the segments of circles must be in the proportion of 3:2, if the crank t is to rotate through 180° and lift the pawl v. If now the motion of the die slide p' be arrested the ratchet wheel l rotates through 60° more, and this motion serves to carry on the ratchet wheel w and the cam q and is brought about by the sector wheels s, the toothed arc z of 60° coöperating with the toothed arc 1 of 180°. The radii of the segments must be in the proportion of 3:1. By the arrangement of the sector wheels s, s the crank is caused always to rotate through 180°, which then again raises the pawl v and causes the travel of the ratchet wheel w, the cam q and the molding table 26. This arrangement, by which the movements are taken up from cranks which always begin to move at the dead point and end there also, affords at the same time the material advantage that the movements of the die, slide and molding table always begin at zero, reach their maximum at the center and end at zero, so that there are no jerks in the working. The shifting of the table by the lower cams is simultaneously effected by a roller 2, Fig. 7. That the table may not tilt, it is driven by two cams q, which lie on either side.

To cause the driving shaft d to be thrown automatically out of gear after an exactly determined number of blows, the following arrangement is provided:—The shaft r of the cams q rotates a disk 4 through the medium of the gears 3, 3 the said device rotating once after a number of blows arranged for each set of molds. In the present case each position is to receive 12 blows (*i. e.* each set $12 \times 9 = 108$ blows). When the lower cam has made one complete revolution, each position has received two blows. For twelve blows therefore it will have to make six revolutions. The proportions of translation of the two spur wheels 3, 3, must be 6:1. The disk 4 has on its circumference a notch in which after each complete revolution *i. e.* after 108 blows, the rod 6, which is under pressure of the spring 5 and which slides on the circumference of the disk 4, engages. The bell crank lever 7 and 8 connected with it is at the same time drawn down, the clutch coupling b released, and the machine brought to a standstill. In order to insure the driving shaft being instantaneously thrown out of gear the following arrangement shown in Fig. 11 and on an enlarged scale in Figs. 12 and 13, may also be made use of. From the shaft 24^a, (Figs. 12 and 13) or d Fig. 11 through the pair of chain wheels 22, 23, the disk 11 is driven with a certain peripheral velocity and simultaneously by the worm gear 16, 17 another disk 12 is driven with so small a peripheral velocity that it only rotates once during the number of revolutions at the end of which the automatic throwing out of gear occurs. Each of the disks 11, 12 has on its edge a notch 18, 19 respectively. The bolt 20, which slides on the edges of both disks under spring pressure falls into the notches directly they come opposite to it simultaneously. The entrance of the bolt immediately causes the clutch coupling b to be thrown out of gear. In this case the proportions chosen for the wheels 22, 23 are 1:4, because in conjunction with the proportion of transmission of the rest of the toothed wheels it is intended that the simultaneous conjunction of the two notches on the disks 11 and 12 and the entrance of the bolt therefrom resulting, shall occur after 108 blows.

Wheels can be employed with more or less teeth than the wheel 15 by using suitable change gear whereby the automatic throwing out of gear of the coupling can be suited to various rotations and numbers of blows. In setting the machine in operation again the bolt must be lifted out of the notches during the first blows *i. e.* until the notch in the rotating disk 4 or 12 has passed under the bolt, and the latter again slides over the edges of the disk. In a machine which also makes test blocks of 20 cm. in length, *i. e.* with four striking positions, a second groove of suitable form, is provided in the cams. The rollers of the slide and of the table are inserted in these second grooves. The sector wheels s are also exchanged for the ordinary spur wheels 24, 25, shown in Fig. 4, with the proportion of translation 2:1, and the six toothed wheels for those of 4 teeth. The two cams now alternately shift their slide, or table, 8.5 cm. forward and backward or to right and left so that the striking points 1, 2, 3, 4 (Fig. 10) comes successively under the die. The point 4 thereupon remains stationary while it receives a second blow, and thereafter the table carrying the mold intermittently runs back through 3, 2, 1, remains stationary at 1, while a second blow is given, and so on. In a machine for longer beam-shaped bodies, the

table is moved through greater distances to and fro by a screw spindle 11^a of several threads as shown in Fig. 8, which spindle is turned right and left by a reversing gear 12^a, according as this is directed for forward or backward motion by a crank disk fixed upon the driving shaft and not shown in the drawing. The block 13^a which is moved to and fro by the spindle 11^a lies on the table 10^a in a slot of such a length that it has a movement equal to the width of the die. This is intended to prevent the slide from returning to the last striking or molding point immediately after the first blow, and to allow it to remain at this point until another blow has fallen, this being the first of the series which is now to ensue in reversed order.

What I claim and desire to secure by Letters Patent is:—

1. In a stamping machine, the combination with the vertically reciprocable die and operative means therefor, of a supporting table, automatic shifting mechanism for effecting a relative movement of said die and table horizontally in one direction and automatic shifting mechanism for effecting a relative movement of the die and table in a direction perpendicular to that produced by the other automatic mechanism, and automatic stop mechanism for stopping the machine when a predetermined number of blows have been struck.

2. In a stamping machine, the combination with a die and means for effecting its vertical reciprocation, of a table beneath said die, automatic mechanism for moving said die horizontally with respect to the table in one direction, and means for moving the table horizontally with respect to the die, in a direction at an angle to the direction of horizontal movement of the die.

3. In a stamping machine, the combination with a die and means for effecting its vertical reciprocation, of a table located beneath the said die, means for horizontally shifting the die in a straight line, means for shifting the table horizontally in a straight line at right angles to the line of travel of the die, automatic operating means for said shifting mechanisms for operating only one of them at a time.

4. In a stamping machine, the combination with a die and mechanism for securing its vertical reciprocation, automatic mechanism for shifting the die and table horizontally with respect to each other in two paths at right angles to each other, driving mechanism, a clutch connecting said driving mechanism with said shifting and die operating mechanism, and an automatic controlling means operated by the machine for throwing said clutch out of operation when a predetermined number of blows have been struck.

5. In a stamping machine, the combination with a die and mechanism for securing its vertical reciprocation, automatic mechanism for shifting the die and table horizontally with respect to each other in two paths at right angles to each other, driving mechanism, a clutch connecting said driving mechanism with said shifting and die operating mechanism, and an automatic controlling means operated by the machine for throwing said clutch out of operation when a predetermined number of blows have been struck and means for adjusting said automatic controlling means, to vary the number of blows to be struck before the clutch is thrown out, substantially as described.

6. In a stamping machine, the combination with a die and mechanism for securing its vertical reciprocation, automatic mechanism for shifting the die and table horizontally with respect to each other in two paths at right angles to each other, driving mechanism, a clutch connecting said driving mechanism with said shifting and die operating mechanism, an automatic device for disengaging said clutch including a pair of rotary devices each provided with a recess, means for operating said rotary devices at different speeds, and a part connected with the clutch, adapted to simultaneously engage the recesses of said rotary parts, when in registration therewith.

7. In a stamping machine, the combination with a die and mechanism for securing its vertical reciprocation, automatic mechanism for shifting the die and table horizontally with respect to each other in two paths at right angles to each other, driving mechanism, a clutch connecting said driving mechanism with said shifting and die operating mechanism, a clutch operating lever, a spring for moving said lever in one direction, a pair of rotary devices having peripheral portions for engaging said lever and holding it when moved in the opposite direction, said peripheral portions having a lever engaging notch in each and means for driving said rotary devices at different speeds.

8. In a stamping machine, the combination with the vertically movable die, of elevating and releasing mechanism therefor, a shifting cam for moving said elevating mechanism horizontally, a table supported below said die, a shifting cam for moving said table horizontally in a direction at right angles to the line of travel of the said die elevating mechanism, and driving devices operatively connected with the die elevating mechanism and said cams for operating the same, substantially as described.

HUGO SCHMIDT.

Witnesses:
HENRY HASPER,
WOLDEMAR HAUPT.