No. 612,922. Patented Oct. 25, 1898.

A. J. BRADLEY.

STENCIL CUTTING MACHINE.

(Application filed Dec. 15, 1894.)

(No Model.) 2 Sheets—Sheet I.

Fig. I.

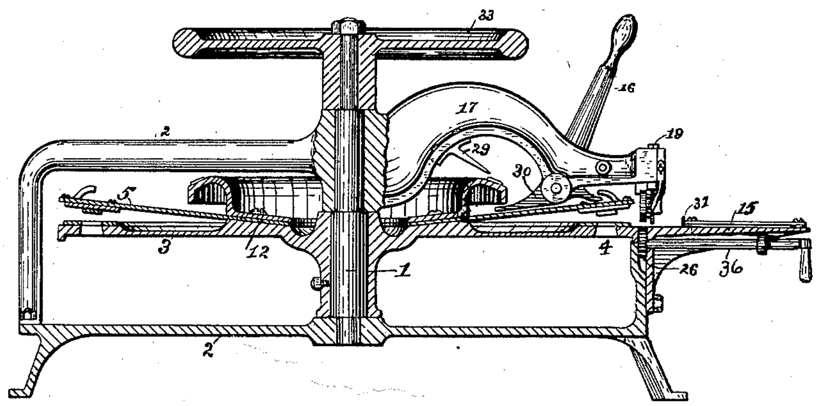
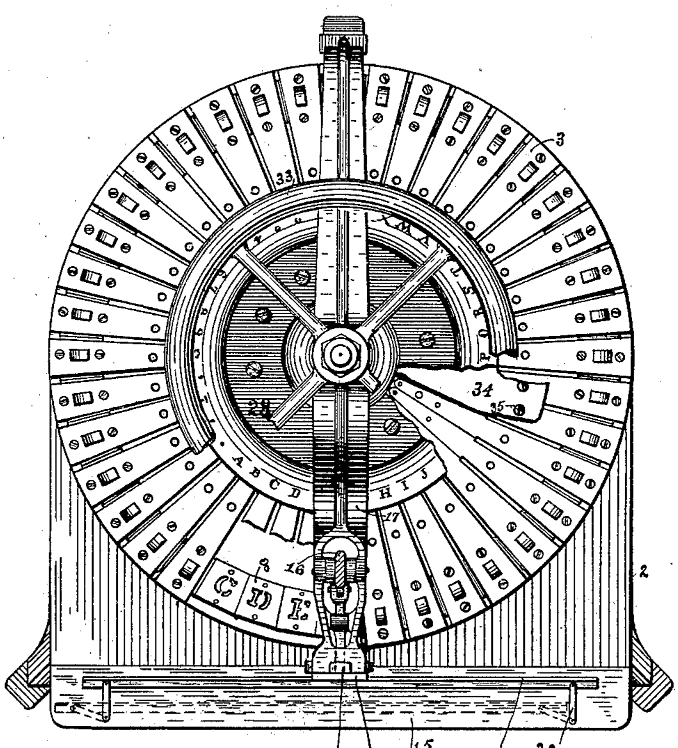


Fig. II.



Attest:-

Harry [illegible]

Chas. E. Wise

Inventor

A. J. Bradley, by

Carr & Carr, Attys

No. 612,922. Patented Oct. 25, 1898.

A. J. BRADLEY.

STENCIL CUTTING MACHINE.

(Application filed Dec. 15, 1894.)

(No Model.) 2 Sheets—Sheet 2.

Fig. III.

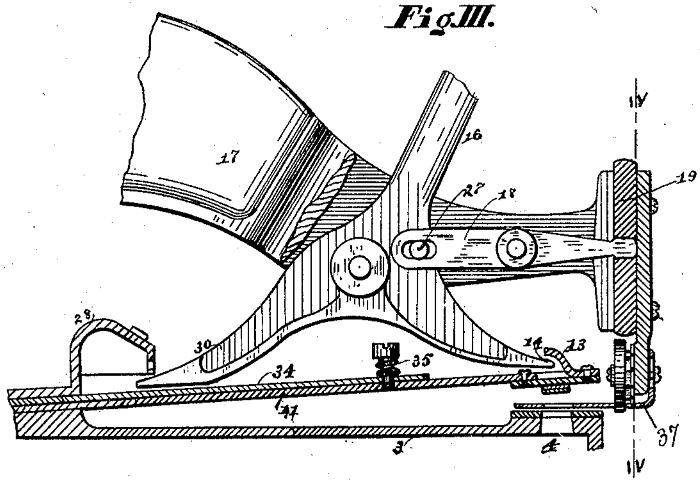


Fig. IV.

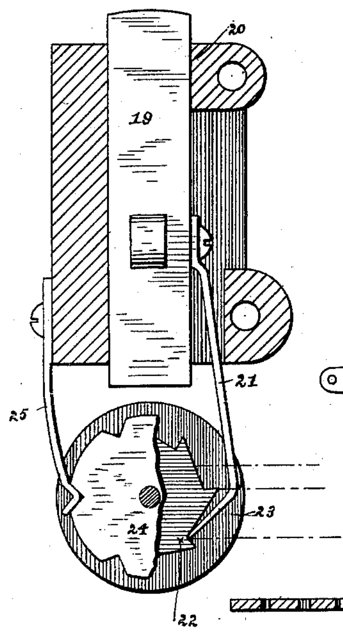


Fig. VIII.

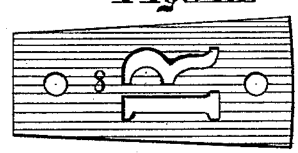


Fig. V.

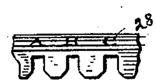


Fig. IX.

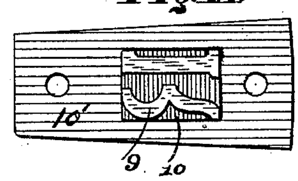


Fig. VI.

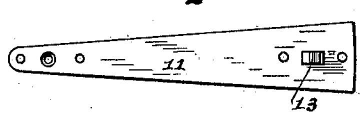
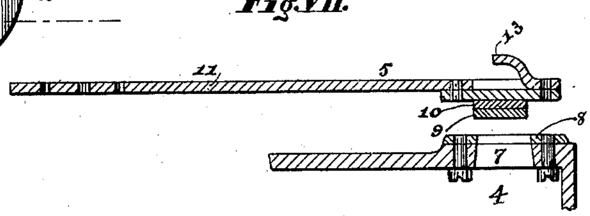


Fig. VII.



Attest:—

Harry Brufruck

Chas. E. Fine

Inventor

A. J. Bradley, by

Carr & Carr, Attys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ANDREW J. BRADLEY, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE BRADLEY STENCIL MACHINE COMPANY, OF MISSOURI.

STENCIL-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 612,922, dated October 25, 1898.

Application filed December 15, 1894. Serial No. 531,865. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. BRADLEY, residing in the city of St. Louis, State of Missouri, have invented a new and useful Improvement in Stencil-Machines, of which the following is a specification.

My invention relates to machines for cutting stencils and analogous purposes; and it consists in the parts and in the arrangements and in the combinations hereinafter set forth.

In the accompanying drawings, which form part of this specification, Figure I is a vertical sectional view of my device. Fig. II is a top plan view thereof with portions broken away to show the arrangements of parts below. Fig. III is an enlarged sectional detail view of the outer end of the operating-lever and the corresponding portion of the die-carrier. Fig. IV is a sectional detail on the line IV IV of Fig. III. Fig. V is a detail of the indicator and guide-plate. Fig. VI is a plan view of the punch-shank. Fig. VII is an enlarged sectional view of a punch and die. Fig. VIII is a plan of a face-plate of a die, and Fig. IX is a face view of a punch before it is mounted on the shank.

A main shaft 1 is supported in any suitable frame 2—as, for instance, by a yoke-piece fixed to the base of the frame. This shaft 1 carries a circular body 3, constituting the die-carrier. Female dies 4 are arranged in a circular row in the carrier 3 near the outer edge. The several punches 5, corresponding to the respective female dies 4, are also permanently secured to the die-carrier 3 in operative relation to their respective female dies. The several punches are operated by a plunger or lever 16, arranged directly above the circular row of punches and adapted to operate by its downward movement any one of the punches which happens to be under it at that time. The punches are normally held away from their dies by springs, which are either separate pieces or, as hereinafter explained, parts of the punches. In order that the several punches may be operated by the one plunger, either the plunger should move in a circular path above the row of punches, as it may do if journaled to the main shaft 1, or the die-carrier should be free to rotate on said supporting-shaft 1. It is preferable to have the die-carrier rotate on the shaft, in which case the plunger may be permanently located at any desired point.

The best specific embodiment of my improvement is the following: Instead of the female punches being formed in the body of the carrier 3 holes or perforations 7 are cast or otherwise made in said carrier where the female dies are to be, said holes being large enough to permit an easy passage therethrough of the punched-out or waste material. Over these holes 7 face-plates 8, containing the proper designs therein with cutting edges, are mounted on the carrier 3.

The punches 5 consist, preferably, of three or four parts—a sharp-edged face piece or pieces 9, constituting the design, a back plate 10, on which such face-piece is mounted, and a spring-shank 11, to which the back plate 10 is rigidly secured. Such a punch fits its corresponding die tight, and together they make a clear-edged cut suitable for stencil purposes, and thus they constitute stencil-character punches and dies. When a fourth piece is used, the arrangement is as follows: The face-piece is soldered or brazed to a back plate 10 small enough to pass through the hole in the stripper-plate 37, hereinafter mentioned. This back plate 10 is soldered to a larger mounting-plate 10′, which is fastened to the shank 11. In the present construction this shank 11 consists of a flat resilient plate, to which near one end the back plate 10 is screwed or otherwise fastened flatwise. The other end of this plate 11 is rigidly fixed to an annular projection or other suitable part 12, integral with or fixed to the upper face of the die-carrier. The several punches are arranged radially, extending outwardly from the annular projection and having their face-plates slightly above the corresponding dies with which they fit, respectively. The shanks being resilient can be depressed by the plunger 16 to coöperate with the dies. The punch is arranged to be normally a slight distance above its female die; but in order to operate satisfactorily its face should, at the point of meeting the edges of the die, be parallel or flush with the face of the die. In order to effect this result, the outer portion of the shank or resilient plate of the punch should

in its depressed position be parallel with the face of the die, and therefore the shank in its normal position is inclined to the face of the die-carrier. The most convenient construction is to have the upper face of the annular hub or projection 12 inclined upwardly from the inner side and to have the resilient shanks arranged radially thereon flatwise, the inclination being sufficient to raise the punches the proper distance from their dies and the highest point of the incline being only slightly removed from the face of the die-carrier. To insure the return of the punch to its proper position, a hook 13 is provided thereon, and a hook 14 is provided on the plunger or lever 16, adapted to coöperate with such hook 13. The hook 13 is preferably formed by being punched out at the same time that the mounting-holes in the shank are formed and so arranged that the plunger or lever hook 13 is under the same when the plunger or lever is in position to operate the punch. As shown, the shank-hook 13 is left integral with its shank at one end and the other projects radially far enough above the shank to permit the punch to move freely past the lever-hook 14, which lies between the shank and its hook 13. To insure all the punches being retained in proper position, a suitable back-stop must be provided for them. A circular plate 34 (see Fig. III) is fixed above the shanks to limit their upward movement. The upward movement of the shank due to its resilience is supplemented by a spiral spring bearing against said circular plate 34 at one end and at the other end against the head of a screw or pin 35, fastened to said shank and projecting upwardly through a hole in said plate 34, in which hole it works freely as the punch moves up and down. By these means all the punch-shanks and their hooks rest normally in two circular rows, whereby the die-carrier may be rotated at pleasure without obstruction from the said lever-hook.

The mechanism for feeding the stencil is as follows: A flat table or shelf 15 is fixed relatively to the arm which supports the plunger 16 and about flush with the top of the female dies. It is preferable that the die-carrier should rotate on or with the shaft, so that the plunger may remain in one place, and in such case the table or shelf 15 is fixed to the front of the frame. The plunger 16 consists, preferably, of a right-angled lever 16, fulcrumed on an arm 17, the shorter lower arm of said lever being in a position to bear down against the several punches. A second smaller lever 18 is fulcrumed on said arm 17 and is connected at one end to the lever 16 by an elongated slot therein fitting over a pin 27 on said lever 16. At the other end said lever 18 is connected to a sliding bar 19, arranged to reciprocate vertically in guides 20, provided therefor in the outer end of the arm 16. The reciprocating bar 19 carries a spring-pawl 21, which is arranged to engage and coöperate with a ratchet-wheel 22, likewise supported by or from the outer end of said arm 17 slightly beyond the punches. The ratchet-wheel 22 is fastened concentrically to a feed-wheel 23, which is adapted to bear edgewise against a stencil-blank resting on the feed-table in a position to be cut. In order to insure an accurate feed, a scalloped or toothed wheel 24 and a steadying-spring 25 are fixed to said arm 17, said spring carrying a triangular piece or roller or other device adapted to fit into the indentations of said scalloped wheel and by centering therein tending to steady the feed-wheel at the desired position. An idle-wheel 26 is journaled below the feed-wheel 23, the two being preferably milled and forming a pair between which the stencil-blank is inserted. The idle-wheel 26 is carried on the arm of a lever 36, which is pivotally supported by the frame or shelf, whereby said idle-wheel 26 is adapted to be moved from and toward the feed-wheel 23 in order to permit a stencil-blank to be inserted between them and to clamp it firmly enough to be fed by the turning of the feed-wheel 23. The end of the arm 17 which carries the punch-operating device has a stripper-plate 37 fastened thereto and projecting inwardly between the punches and dies slightly above the dies. This plate 37 has an opening therein large enough and in proper position to permit the punches to pass through and coöperate with their dies. The function of this plate is to prevent the stencil-blank clinging to a punch, its operation being to hold back or strip off the blank as it tends to rise with the punch.

The best time for feeding the stencil-blank is after a character has been cut and the punch has become disengaged from said blank. In the present device this feed is effected by the latter portion of the return stroke of the plunger-lever 16, the first portion of said return stroke being provided against by a suitable lost-motion device. In the construction illustrated in Fig. IV the ratchet-wheel 22 is so arranged that when the pawl 21 is retracted said pawl is a definite distance above the ratchet-tooth which it is to engage in its next forward movement. (See dotted lines in Fig. IV.) The movement of the pawl 21 is without operative effect until the pawl engages said tooth, and therefore the distance which the pawl is retracted above the tooth is determined by the distance which the punch-operating lever moves before the punch is clear of the stencil-blank.

The die-carrier may be turned by a hand-wheel 33, fixed to the shaft for that purpose. A very convenient indicator is formed by a circular casting or plate 28, fixed concentrically on the die-carrier and serving to clamp the tailpieces of the punches more firmly. This casting or plate has a raised portion, upon whose upper surface is cast or mounted the several characters corresponding to the dies below them, respectively. This indi-

cator-surface may be inclined downwardly slightly from the center in order to present a better view of the character to the operator. A pointer 29 is fastened to the plunger or lever support in a position to point out the particular character whose punch is in position to be operated by the punch-operating lever. The outer edge of the indicator plate or casting is turned down and notched or indented, as shown in Fig. V. These notches or indentations serve as guides or centering devices for a tailpiece or projection 30 on the plunger-lever 16, there being one notch for each punch. This tailpiece 30 projects inwardly and in its normal position lies above the punch-shanks and just below the outer outer edge of the indicator casting or plate. As soon as the plunger-lever begins to move and before the punch has reached the stencil-blank this tailpiece strikes one of the inclined sides of the corresponding notch and by bearing thereon turns the die-carrier into exact position before the punch reaches the die.

The feed table or shelf 15 is furnished with a straight ruler 31, resting thereon and pivotally connected thereto by parallel links 32 of equal length. Said links are made to work stiff or hard on their pivots, so as to guard against accidental displacement from their adjusted position. The stencil-blank is laid on the table or shelf with its edge against this ruler, securing a proper alinement for the stencil address. When the second and other lines are to be cut, the ruler is moved forward more or less, but always parallel with its first position, so as to have the new lines on the stencil parallel with the first. Marks may be made on the table or shelf to indicate the desired positions of the ruler.

The operation of the device is as follows: The stencil-blank is laid upon the table or shelf 15 with one edge against the ruler and projecting inwardly between the dies and punches. The die-carrier is then turned by the hand-wheel 33 until the character to be cut is pointed out on the indicator 28 by the pointer 29. Then the hand-lever 16 is operated. The first part of the movement of this lever causes the tailpiece 30 to bear on the incline of the guide-notch, thereby turning the die-carrier into position to have the character cut at the proper distance from the preceding character. The right-angled arm of the lever bears against the punch below it, flexing the shank thereof and causing the cutting-face of the punch to coöperate with the die by a motion perpendicular to the face of said die, thus cutting the desired character in the stencil-blank. The downward motion of the lever 16 is transmitted by the lever 18 to the reciprocating bar 19, thereby raising the pawl thereon into a position to coöperate on the return stroke with the ratchet-wheel. On the return stroke of the lever 16 the right-angled arm or a hook thereon engages the raised lip or hook 13 on the punch and pulls the punch free from its die, and the resilience of the spring-shank raises the punch into its proper normal position. This return stroke of the lever 16 is transmitted by the lever 18, but on account of the lost-motion device (shown in Fig. IV) the pawl 21 does not engage the ratchet-wheel 22 until the punch is pulled clear of the die. Then the pawl engages the ratchet-wheel and turns it one space, the spring steadying or centering device serving to carry the wheel forward or bring it back into the exact position to feed one space. The ratchet-wheel carries with it the feed-wheel 23, between whose edge and the edge of the coöperating idle-wheel 26 the blank is clamped. The blank is thus fed forward one space, and the machine is in its original condition ready to perform the like operation for any other character.

What I claim is—

1. A stencil-machine consisting of a frame, a vertical shaft supported thereby, a rotary die-carrier on said shaft, punches and dies arranged in a circular row on said die-carrier, a raised circular portion fixed concentrically to said die-carrier and having its outer edge portion extending downwardly, said downwardly-extending portion having guiding indentations therein corresponding to the several punches, and a hand-lever pivoted on said frame above said punches for operating said punches, said lever having an inwardly-projecting tailpiece adapted to enter said indentations, substantially as and for the purpose set forth.

2. A stencil-machine consisting of a frame, a vertical shaft supported thereby, a rotary die-carrier on said shaft, stencil-character punches and dies operatively arranged in a circular row on said die-carrier, said punches consisting of resilient shanks arranged radially and carrying the design portion on the under face near the outer end, and a hand-lever pivoted on said frame for operating said punches, each of said punches having a raised hook portion punched therefrom and said lever having a hook portion adapted to coöperate with the hooks on the punches respectively, substantially as described.

3. A stencil-machine consisting of a frame, a vertical shaft supported thereby, a rotary die-carrier on said shaft, punches and dies operatively arranged in a circular row on said die-carrier, said punches consisting of resilient shanks arranged radially and carrying the design portion on the under face near the outer end, each of said punches having a raised hook arranged radially and means for raising said punch, a circular back-stop arranged to keep the shank of said punches and their hooks normally in two circular rows, and a hand-lever on said frame for operating said punches, said hand-lever having a hook portion adapted to rest normally between said circular rows, substantially as described.

4. A stencil-machine consisting of a frame, a vertical shaft supported thereby, a rotary

die-carrier on said shaft, stencil-character punches and dies operatively carried on said die-carrier, a lever pivoted on an arm of said frame and adapted to operate said punches, a ratchet-wheel also journaled on said arm and a feed-wheel rigidly connected with said ratchet-wheel, an idle-wheel journaled in a movable bearing on the frame to coöperate with said feed-wheel, a reciprocating bar moving in guides in said arm and a pawl on said bar to coöperate with said ratchet-wheel, and a lever pivoted on said arm and connected to said first-mentioned lever and to said reciprocating bar, substantially as described.

ANDREW J. BRADLEY.

Witnesses:
JAMES A. CARR,
JAMES J. O'DONOHOE.