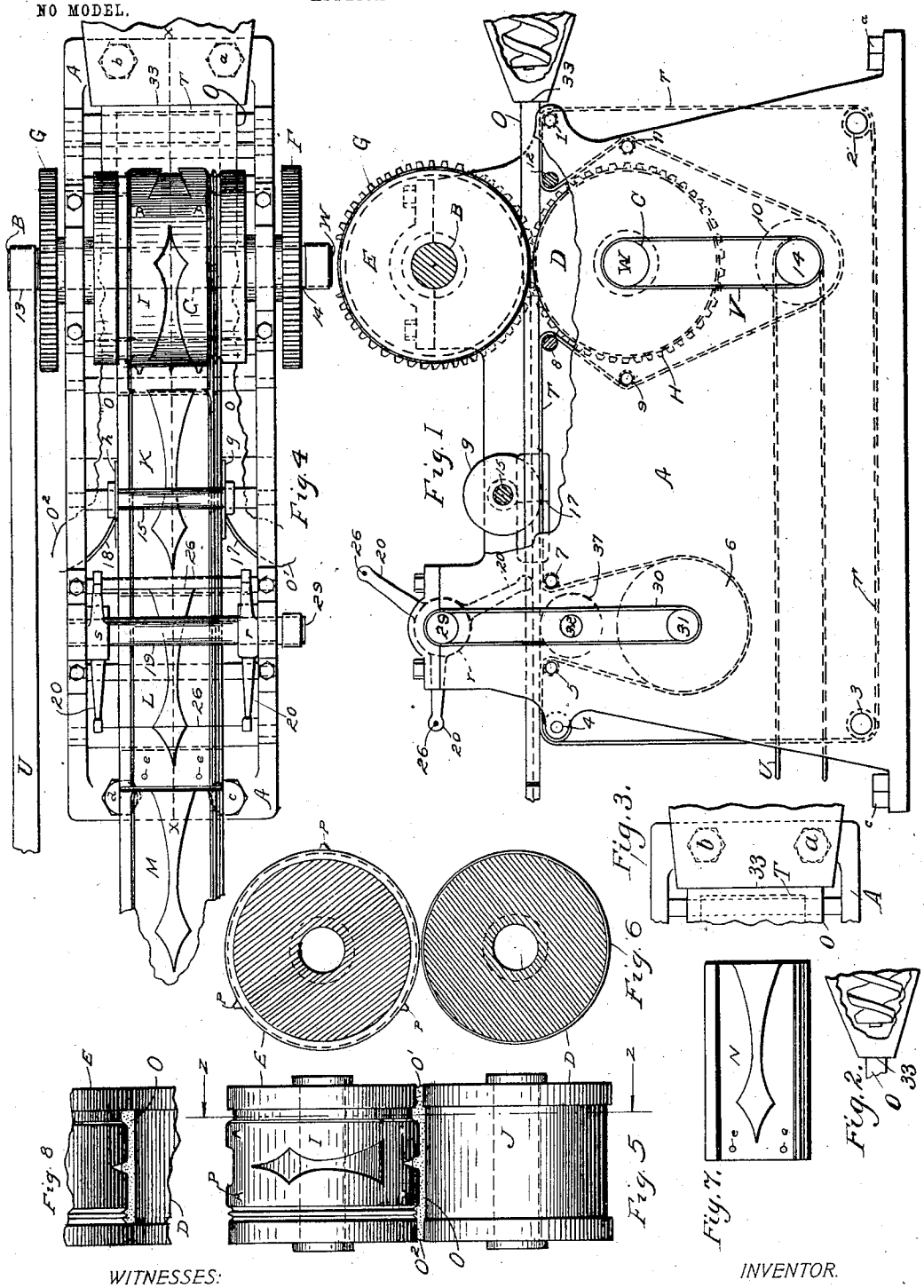
No. 753,981. PATENTED MAR. 8, 1904.

E. C. HOELSCHE.

MACHINE FOR STAMPING OR SHAPING PLASTIC CLAY, SHALE, &c., INTO VARIOUS PATTERNS OR ARTICLES.

APPLICATION FILED SEPT. 14, 1903.

NO MODEL.



WITNESSES:

Roscoe A. Johnson.
Thos. H. Thorne.

INVENTOR.

Edmund C. Hoelsche

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

No. 753,981. Patented March 8, 1904.

UNITED STATES PATENT OFFICE.

EDMOND C. HOELSCHE, OF CHICAGO, ILLINOIS.

MACHINE FOR STAMPING OR SHAPING PLASTIC CLAY, SHALE, &c., INTO VARIOUS PATTERNS OR ARTICLES.

SPECIFICATION forming part of Letters Patent No. 753,981, dated March 8, 1904.

Application filed September 14, 1903. Serial No. 173,198. (No model.)

To all whom it may concern:

Be it known that I, EDMOND C. HOELSCHE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Machines for Stamping or Shaping Plastic Clay, Shale, or other Plastic Material into Various Patterns or Articles, of which invention the following is a specification.

My invention relates more particularly to a machine for stamping and shaping plastic clay or shale in the manufacture of roofing-tiles, although it can be very easily and handily adapted to make various other articles of such material.

Heretofore plain shapes of roofing-tiles have been made by the particular form of the mouthpiece of what are commonly known as "auger" or "plunger" machines, in which an auger or a piston or plunger device is used for forcing the plastic clay or shale out through the said mouthpiece of the machine in the form of a strip or ribbon, which is afterward cut into pieces of the desired lengths; but there are many shapes or patterns of roofing-tiles that cannot be formed or made by such machines and have heretofore been made either in a mold by hand or in a press with one part of the die secured to the lower end of a vertically-operating piston or plunger and the other part of the die placed below it on the platen of the press. By these methods the clay or shale is put into the molds or dies by hand and enough only to make but one tile at a time. For the press the clay or shale is usually first made into pieces of some particular shape and with a like quantity in each piece. Dies and molds of plaster-of-paris have been considerably used, because the clay or shale does not adhere or cling so strongly to them as to those made of metal, even though the metal dies have very smooth surfaces, but if metal dies could be more successfully used they would be greatly preferred to those made of plaster-of-paris, and especially for use with presses, because the metal dies are so much stronger and more durable than those made of plaster-of-paris. Aside from the tendency of the clay or shale to so cling to metal surfaces the suction greatly adds to the difficulty of getting the tile or articles out of the dies. By lubricating metal dies with oil the articles come out of the dies more easily; but in other respects the use of oil is objectionable, because more or less of it gets between the parts of the clay or shale in the dies, prevents a complete union of said parts, and causes what are termed "oil-checks" or "defects" in the product, which render the article unfit for use and unmerchantable. Furthermore, the oil from the dies imparted to the surface of the tile or article is liable to prevent a glaze material from adhering to it properly, if it is desired to put a glazed surface on the tile or article. In making roofing-tiles by the said press method their sides must be beveled both ways for "draft purposes," as it is technically termed, in order that the tile may be gotten out of the upper and lower dies more easily; but this greater width through the central part of the thickness of the tile prevents them from fitting closely together and making good close side joints when laid on the roof, as would be the case if their sides were trimmed straight or squarely and without the beveled or draft feature. All things considered, the making of roofing-tile by the old hand-molding and press methods, above described, is so slow, involves so much handwork, and produces so many defective tiles that those that are good enough to be merchantable are thus rendered quite expensive. Knowing of these drawbacks and difficulties, I have sought to remedy them as much as possible by inventing a machine that will operate quickly and with its various automatic features save time, labor, and money, making the cost of its product much less than by other methods, and a machine also on which metal dies can be more successfully used than on the old kinds of presses, because the dies of my machine are located on the rollers, are of curved form, and as the tile made in the strip or ribbon of clay only comes in contact with but a small area of the dies at any one time while passing straight out between the rollers the amount of suction, if any, is therefore rendered very small indeed, and the strip or ribbon with the tile stamped and shaped in it is made to answer a very important purpose

in the operation by serving as a lever to pry the tile out of the dies as rapidly as the rollers have turned far enough to enable this to be done. If such rollers were used with dies adapted to make each tile separately instead of being made in a strip or ribbon and passing straight out between the rollers, there would be considerable suction in the case of the separate tile, and the tendency would be for it to strongly cling to one or the other of the dies and go around with the roller and perhaps block the operation or make it necessary to stop the machine to remove the tile, which would then be useless by reason of the curvature imparted by the curved die when the tile is thus allowed to remain in the die instead of being pried out automatically, as by my method, and before the tile had gotten so far around and so much curved.

It will be readily seen that stamping and shaping the tile in a strip or ribbon and cutting them apart afterward makes a great success of that which would otherwise be a serious failure on a machine having two rollers with dies on them, if adapted only to making the tile singly and not in a strip or ribbon, as above described. The surplus margin left or made on the sides of the strip or ribbon serves to increase its strength and rigidity, and being formed outside of the dies proper that are required for making the tile part the margins reduce the height of the side walls of the tile part of the dies, and with the dies thus made so much shallower the tile will of course come out more easily. If in stamping openings, perforations, or thin parts are necessarily required in the central part of the strip or ribbon, the said outside surplus margin serves to keep the strip or ribbon from breaking apart before it has fully performed its important part in the operation. The nail-holes in tile are usually punched by hand after the tile is formed and out of the dies; but in my machine the studs hereinafter described automatically punch the nail-holes and while the tile is still between the dies.

My machine can be fed automatically with a strip or ribbon of clay forced out of the mouthpiece of an auger or plunger machine and passing between the rollers, which makes the operation continuous and without the frequent stoppages for hand-feeding, and no stoppages are required for removing the tile from the dies, as in the old press methods.

My invention includes other good features which are hereinafter described and claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a side elevation of my clay stamping and shaping machine with a portion of the side of the frame broken away to more clearly show the parts behind it. In this view the main belt is shown broken off, and the outer part of the upper roller shaft is shown in cross-section and with both of the front gear-wheels removed from the shafts. Fig. 2 indicates a side elevation of a broken section of an auger-machine out of which the clay is forced in the form of a strip or ribbon for feeding my stamping and shaping machine. Fig. 3 indicates a top or plan view of a broken section of an auger-machine which is also shown in side elevation in Fig. 2. Fig. 4 is a top or plan view of my clay stamping and shaping machine, showing its main belt broken off, also showing one roofing-tile in broken section and other roofing-tiles in process of being trimmed at their sides and cut apart at their ends. Fig. 5 shows the upper and lower rollers removed from their shafts and from the frame of the machine and also shows between the rollers and dies a cross-section of the strip or ribbon of plastic clay. Fig. 6 is a cross-sectional view of the two rollers of my machine as cut on line Z Z of Fig. 5. Fig. 7 indicates a plan view of a roofing-tile with a raised pattern or design on the central part of its top. Fig. 8 is a view of the rollers of my machine in broken section, showing the face of the rollers and dies so modified as to leave off the surplus side margin parts of the strip or ribbon O.

The frame A of my machine may be made of metal or wood or a combination of both and of any shape or form best suited to contain and accommodate the working parts therein. In this instance the frame is shown with an opening in the top to accommodate the ribbon-carrying belt, and the frame is made separable longitudinally on dotted line X X of Fig. 4. The vertical side pieces of the frame A may have horizontal flanges or feet to afford a seat for the bolts *a b c d* for securing the frame to the floor or foundation. The said side pieces of the frame A have circular openings made through them to receive and serve as end bearings for the various shafts of my machine. With their end bearings in the sides of the frame are two parallel shafts B and C, and secured to the lower shaft C is a roller D, and secured to the upper shaft B is a roller E, and secured to one end of said upper shaft B is a gear-wheel F, and at the other end of said shaft is secured a gear-wheel G, which latter gear-wheel meshes with a similar gear-wheel H, secured to the lower shaft C, and the gear-wheel F properly meshes with a similar gear-wheel just below it, secured to the lower shaft C. In some cases I may use only one pair of gear-wheels meshing together for causing the rollers to rotate in unison. On or in the faces of the rollers D and E, I make dies or stamping and shaping surfaces I and J, which surfaces are raised or sunken, plain or otherwise, according to the requirements of the shape or form of the article to be made in said dies. In this instance a series of dies are made on the faces of the rollers for stamping and shaping roofing-tiles K L M in or on the strip or ribbon O of plastic shale or clay. In some cases I suit-

ably secure to the face of the roller or dies outwardly-projecting studs P with curved sides for making the nail-holes *e* in the roofing-tiles N and L. To receive and aid the outward movement of the strip or ribbon of clay or shale, I in this instance show a wide endless belt T, that runs on loose pulleys 1 2 3 4 5 6 7 8 9 10 11 12, which pulleys have their end bearings in suitable circular openings in the side pieces of the frame. The driving-belt U passes about a pulley 13, which is on the same shaft as pulley 14, which is connected with a pulley W on the front end of shaft C by a belt V for rotating the lower roller D, which through the gear connections also rotates the upper roller E. In front of the rollers D and E is a shaft 15 with its end bearings in the sides of the frame A, and secured to this shaft 15 are two thin circular disks *g* and *h*, which disks rotate and longitudinally trim off the surplus margin strips O′ and O^2 from the strip or ribbon O as it moves outwardly against the cutting edges of said rotating disks *g* and *h*. Just behind the disks *g* and *h* I sometimes suitably secure to the top part of the frame two upwardly-projecting thin curved plates or flanges 17 and 18 to guide off at the sides of the frame through suitable openings made therefor the surplus margin strips O′ and O^2 as they are cut from the strip or ribbon O by the disks *g* and *h*. The shaft 19, which also has its end bearings in the sides of the frame of the machine, has two hubs *r* and *s* secured thereon, each of which hubs have equidistant outwardly-projecting spokes or arms 20, and to each of said arms is secured a fine wire 26, which is stretched across and secured to the arm opposite it on the other hub, and on the shaft 19 is a pulley 29, which is driven by a belt 30 from the pulley 31 on the same shaft as the pulley 6, and said cutting device is driven or caused to rotate at the same rate of speed as the moving belt T, and as the said strip or ribbon of clay with the tiles stamped or shaped therein or thereon moves along on said belt T under the cutting device the wires thereof cut the tiles apart at their ends, the finish of said cutting process being done on top of the loose roller 37, which is secured to its shaft 32, and said shaft has its end bearings in the sides of the frame. In operation the plastic clay or shale is forced out through the mouthpiece 33 of an auger-machine and passes along on the belt T between the rollers D and E, as hereinbefore described.

The rollers D and E may be made of metal or any other suitable material, and they may be cast hollow, if desired, to lighten them. The dies or shaping-surfaces are in this instance shown as made in or on the faces of the rollers; but in practice I may make the dies as separate parts and secure them in any simple and suitable manner to the rollers or in suitable seats or openings made in the faces of the rollers therefor, which seats or openings are, however, not shown in the drawings.

In stamping or shaping an article on a strip or ribbon of plastic clay or shale with my machine where the article is too thin in places or where necessary perforations would render the central part of strip or ribbon liable to wrinkle or buckle and too frail to render the full operation successful the surplus side margins O′ and O^2 may be made thick enough to give the strip or ribbon the necessary strength and rigidity, as plastic clay or shale is more tender and in stamping and shaping must have different treatment from that given cold metals or other kinds of materials that are stronger and more rigid.

In some cases where the strip or ribbon and articles stamped therein or thereon would be thick, rigid, and strong enough to answer the purpose without having the surplus margin parts at the sides the face of the roller or dies can be modified, so as to leave one or both of them off the strip or ribbon, as in the latter case shown in the sectional view in Fig. 8.

While I have shown and described one form of my invention, I do not wish to be limited thereto, as many slight modifications could be made without departing from the spirit thereof.

What I claim as my invention, and wish to secure by Letters Patent, is—

1. In a machine for stamping and shaping a series of articles or patterns from a strip or ribbon of clay or other plastic material, the combination of a frame with a pair of rollers mounted parallel to each other and adapted to rotate therein, suitable driving-gears and means in connection with said rollers to cause them to rotate in unison, suitable dies or shaping-surfaces made on the periphery of said rollers for shaping articles or patterns from a strip or ribbon of clay or other plastic material and also adapted to leave or form a surplus margin on the side of said strip or ribbon when said strip or ribbon is fed between said rollers, an outwardly-projecting fixed stud or device made on the face of one of said rollers for punching a hole in said patterns or articles, and of suitable means for both trimming off said surplus side margin and cutting said patterns or articles apart after said strip or ribbon has passed between and beyond said rotating rollers, all substantially as described and for the purposes set forth.

2. In a machine for stamping and shaping a series of articles or patterns from a strip or ribbon of clay or other plastic material, the combination of a frame with a pair of rollers mounted parallel to each other and adapted to rotate therein, suitable driving-gears and means in connection with said rollers to cause them to rotate in unison, suitable dies or shaping-surfaces made on the periphery of said rollers for shaping articles or patterns from a

strip or ribbon of clay or other plastic material and also adapted to leave or form a surplus margin on the side of said strip or ribbon when said strip or ribbon is fed between said rollers, an outwardly-projecting curved stud or device made on one of said rollers and of suitable means for both trimming off said surplus side margin and cutting said patterns or articles apart after said strip or ribbon has passed between and beyond said rotating rollers, all substantially as described and for the purposes set forth.

3. In a machine for stamping and shaping a series of articles or patterns from a strip or ribbon of clay or other plastic material, the combination of a frame with a pair of rollers mounted parallel therein, suitable driving-gears and means in connection with said rollers to cause them to rotate in unison, suitable dies or shaping-surfaces made on the periphery of said rollers for shaping articles or patterns from a strip or ribbon of clay or other plastic material when said strip or ribbon is fed between said rollers, an outwardly-projecting fixed stud or device made on the face of one of said rollers for punching a hole in said articles or patterns, a suitable bearing located near and in front of said rollers for receiving and supporting said strip or ribbon after it has passed between and beyond said rollers, and suitable means for cutting said patterns apart after said strip or ribbon has passed between and beyond said rollers, all substantially as shown and described and for the purposes set forth.

4. In a machine for stamping and shaping a series of articles or patterns from a strip or ribbon of clay or other plastic material, the combination of a frame with a pair of rollers mounted parallel to each other and adapted to rotate therein, suitable driving-gears and means in connection with said rollers to cause them to rotate in unison, suitable dies or shaping-surfaces made on the periphery of said rollers for shaping articles or patterns from a strip or ribbon of clay or other plastic material and also adapted to leave or form a surplus margin on the side of said strip or ribbon when said strip or ribbon is fed between said rollers, an outwardly-projecting fixed stud or device made on the face of one of said rollers for punching a hole in said patterns or articles, a suitable bearing located near and in front of said rollers for receiving and supporting said strip or ribbon after it has passed between and beyond said rollers, and suitable means for both trimming off said surplus side margin and cutting said articles or patterns apart after said strip or ribbon has passed between and beyond said rotating rollers, all substantially as shown and described and for the purposes set forth.

5. In a machine for stamping and shaping a series of articles or patterns from a strip or ribbon of clay or other plastic material, the combination of a frame with a pair of rollers mounted parallel to each other and adapted to rotate therein, suitable driving-gears and means in connection with said rollers to cause them to rotate in unison, suitable dies or shaping-surfaces made on the periphery of said rollers for shaping articles or patterns from a strip or ribbon of clay or other plastic material and also adapted to leave or form a surplus margin on the side of said strip or ribbon when said strip or ribbon is fed between said rollers, an outwardly-projecting curved stud or device made on the face of one of said rollers for punching a hole in said patterns or articles, a suitable bearing located near and in front of said rollers for receiving and supporting said strip or ribbon after it has passed between and beyond said rollers, and suitable means for both trimming off said surplus side margin and cutting said patterns or articles apart after said strip or ribbon has passed between and beyond said rotating rollers, all substantially as shown and described and for the purposes set forth.

6. In a machine for stamping and shaping a series of articles or patterns from a strip or ribbon of clay or other plastic material, the combination of a frame with a pair of rollers mounted parallel to each other and adapted to rotate therein, suitable driving-gears and means in connection with said rollers to cause them to rotate in unison, suitable dies or shaping-surfaces made on the periphery of said rollers for shaping articles or patterns from a strip or ribbon of clay or other plastic material and also adapted to leave or form a surplus margin on the side of said strip or ribbon when said strip or ribbon is fed between said rollers, an outwardly-projecting fixed stud or device made on the face of one of said rollers for punching a hole in said patterns or articles, a belt suitably located near and in front of said rollers for receiving, supporting and carrying along said strip or ribbon after it has passed between said rollers, means for operating said belt, and of suitable means for both trimming off said surplus side margin and cutting said patterns or articles apart after said strip, or ribbon has passed between and beyond said rotating rollers, all substantially as shown and described and for the purposes set forth.

7. In a machine for stamping and shaping a series of articles or patterns from a strip or ribbon of clay or other plastic material, the combination of a frame with a pair of rollers mounted parallel to each other and adapted to rotate therein, suitable driving-gears and means in connection with said rollers to cause them to rotate in unison, suitable dies or shaping-surfaces made on the periphery of said rollers for shaping articles or patterns from a strip or ribbon of clay or other plastic material and also adapted to leave or form a surplus margin on the side of said strip or ribbon

when said strip or ribbon is fed between said rollers, an outwardly-projecting curved stud or device made on the face of one of said rollers for punching a hole in said patterns or articles, a belt suitably located near and in front of said rollers for receiving, supporting and carrying along said strip or ribbon after it has passed between said rollers, means for operating said belt, and of suitable means for both trimming off said surplus side margin and cutting said patterns or articles apart after said strip or ribbon has passed between and beyond said rotating rollers, all substantially as shown and described and for the purposes set forth.

8. In a machine for stamping and shaping a series of articles or patterns from a strip or ribbon of clay or other plastic material, the combination of a frame with a pair of rollers mounted parallel to each other and adapted to rotate therein, suitable driving-gears and means in connection with said rollers to cause them to rotate in unison, suitable dies or shaping-surfaces made on the periphery of said rollers for shaping articles or patterns from a strip or ribbon of clay or other plastic material and also adapted to leave or form a surplus margin on the side of said strip or ribbon when said strip or ribbon is fed between said rollers, a belt suitably located near and in front of said rollers for receiving, supporting and carrying along said strip or ribbon after it has passed between said rollers, means for operating said belt, and of suitable means for both trimming off said surplus side margin and cutting said articles or patterns apart after said strip or ribbon has passed between and beyond said rollers, all substantially as shown and described and for the purposes set forth.

9. In a machine for stamping and shaping a series of articles or patterns from a strip or ribbon of clay or other plastic material, the combination of a frame with a pair of rollers mounted parallel to each other and adapted to rotate therein, suitable driving-gears and means in connection with said rollers to cause them to rotate in unison, suitable dies or shaping-surfaces made on the periphery of said rollers for shaping articles or patterns from a strip or ribbon of clay or other plastic material and also adapted to leave or form a surplus margin on the side of said strip or ribbon when said strip or ribbon is fed between said rollers, a belt suitably located near and behind said rollers for receiving, supporting, carrying along and properly guiding said strip or ribbon between said rotating rollers, means for operating said belt, and of suitable means for both trimming off said surplus side margin and cutting said patterns or articles apart after said strip or ribbon has passed between and beyond said rotating rollers, all substantially as shown and described and for the purposes set forth.

10. In a machine for stamping and shaping a series of articles from a strip or ribbon of clay or other plastic material, the combination of the main frame A with the pair of rollers E and D mounted parallel to each other and adapted to rotate therein, suitable driving-gears and means in connection with the rollers to cause them to rotate in unison, suitable dies or shaping-surfaces made on the periphery of said rollers for shaping patterns or articles from a strip or ribbon of clay or other plastic material when said strip or ribbon is fed between said rollers, the belt T, the driving-belt U, and the trimming-disks *g* and *h*, all substantially as shown and described and for the purposes set forth.

11. In a machine for stamping and shaping a series of patterns or articles from a strip or ribbon of clay or other plastic material, the combination of the main frame A with the pair of rollers E and D mounted parallel to each other and adapted to rotate therein, suitable driving-gears and means in connection with the rollers to cause them to rotate in unison, suitable dies or shaping-surfaces made on the periphery of said rollers for shaping articles or patterns from a strip of clay or other plastic material when said strip or ribbon is fed between said rollers, the belt T, the driving-belt U, the rotary trimming-disks *g* and *h*, and the cross-cutting wires 26, attached to the spokes 20 of the cutting-wheel, and means for driving said cross-cutting wheel, all substantially as shown and described and for the purposes set forth.

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

EDMOND C. HOELSCHE.

Witnesses:

ROSCOE A. JOHNSON,

THOS. W. THORNE.