Oct. 4, 1927.

1,644,368

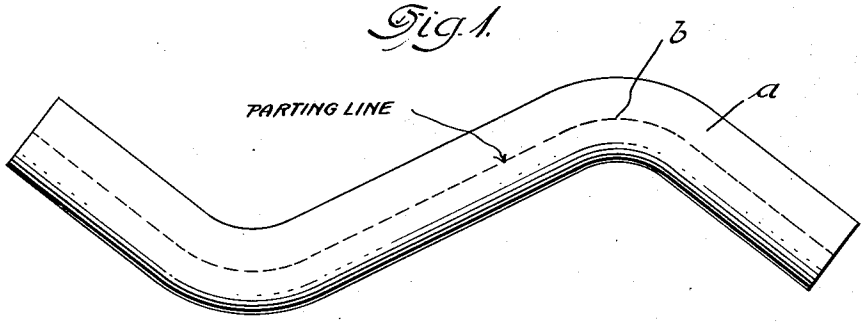
L. G. COPEMAN

MATCH PLATE PATTERN

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4 Sheets-Sheet 1

Fig. 1.



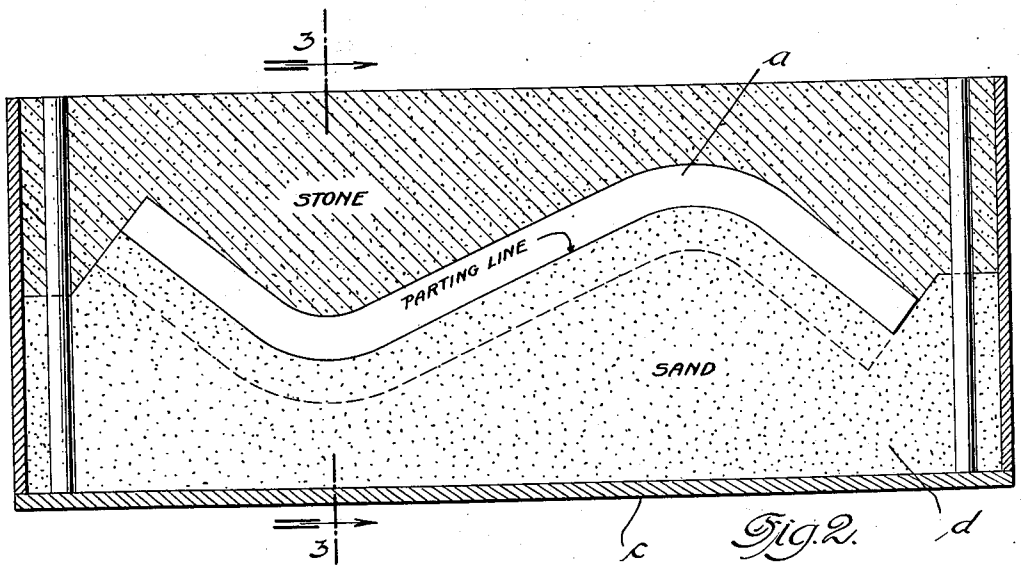


Fig. 2.

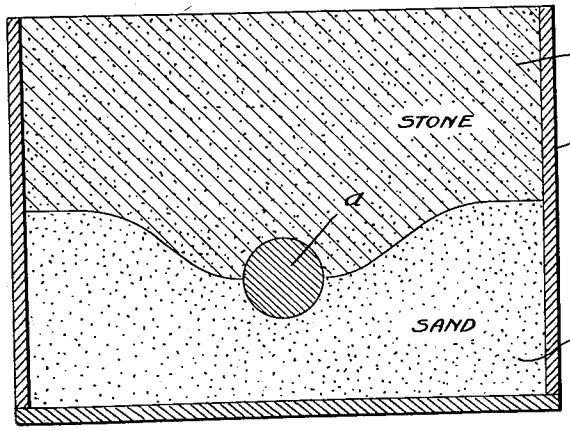


Fig. 3.

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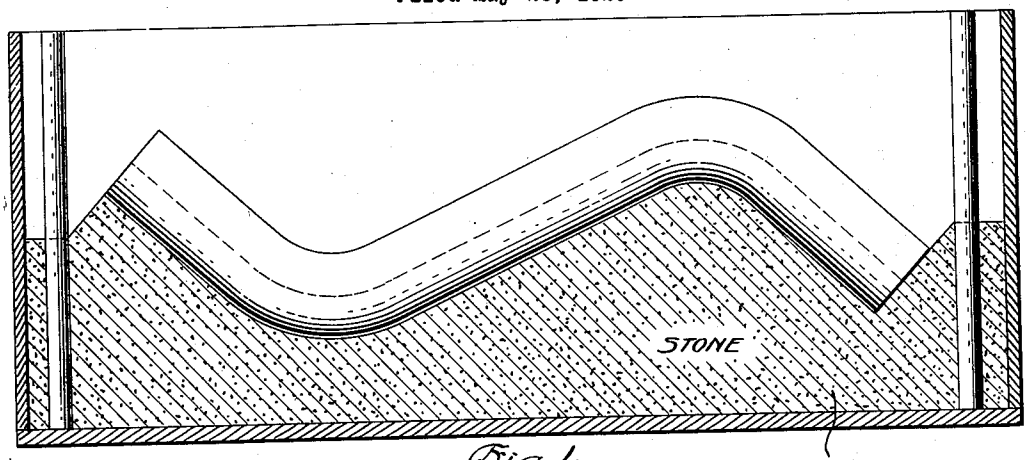


Fig. 4.

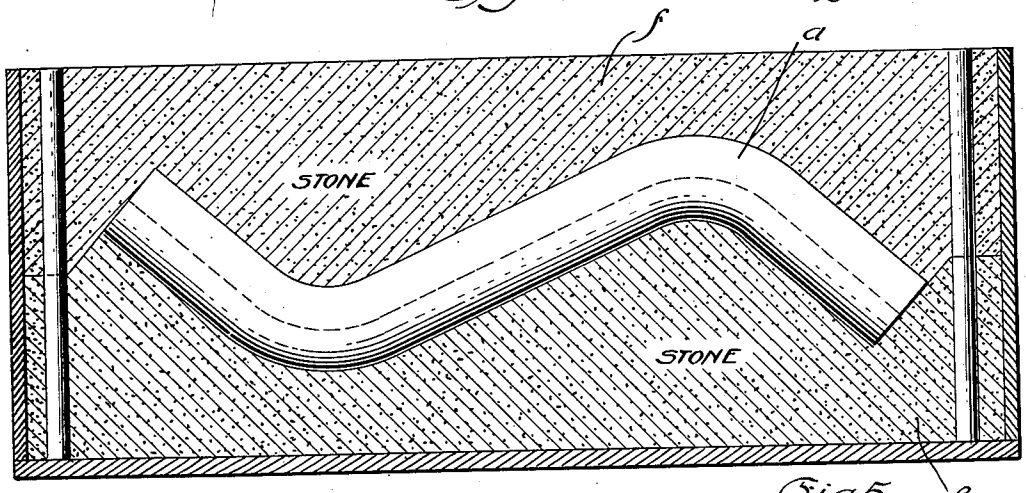


Fig. 5.

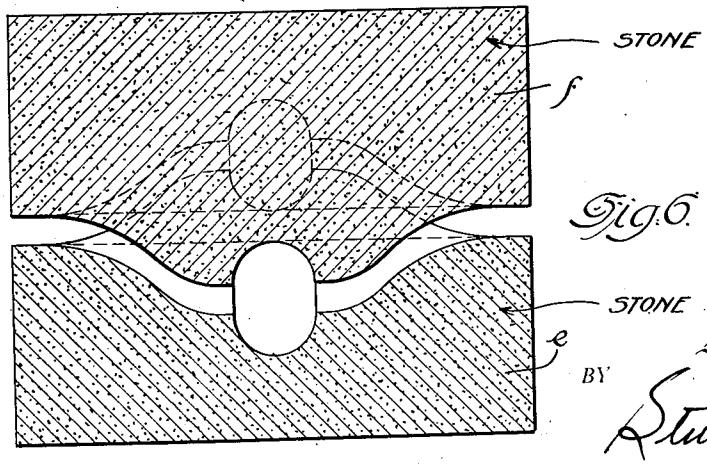


Fig. 6.

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MATCH PLATE PATTERN

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Fig. 7.

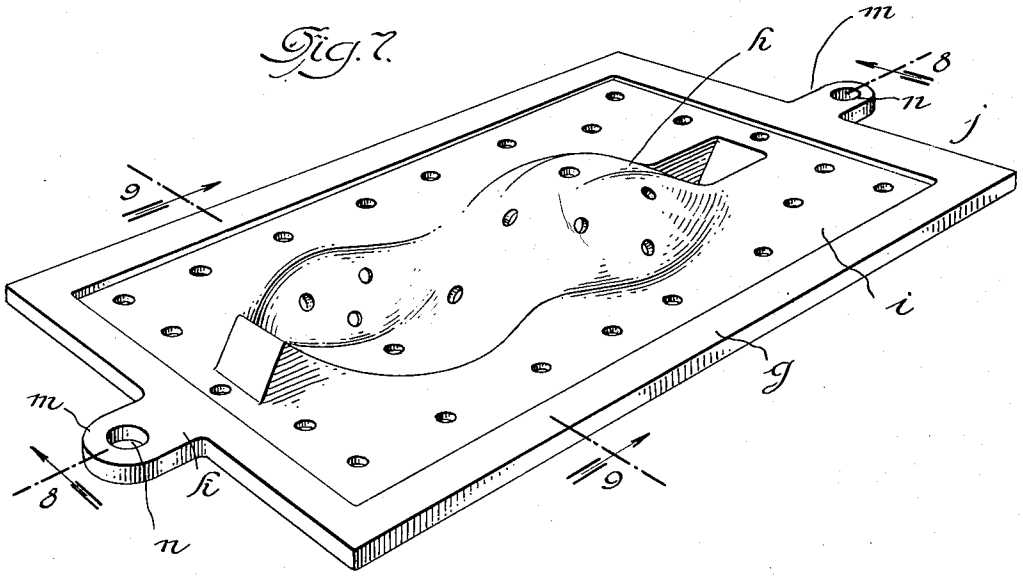
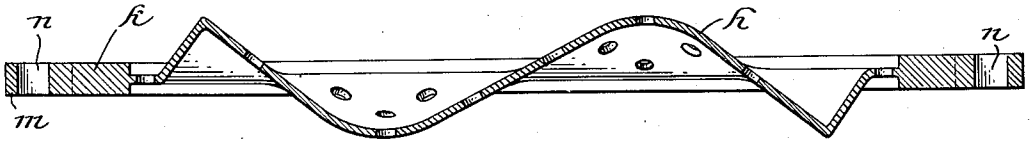


Fig. 8.



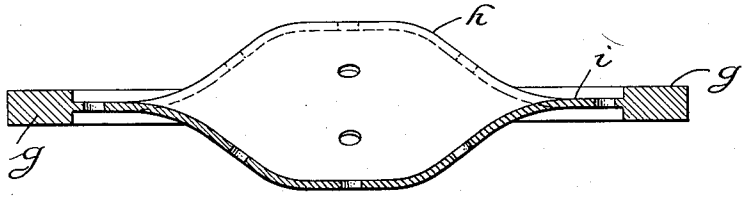


Fig. 9.

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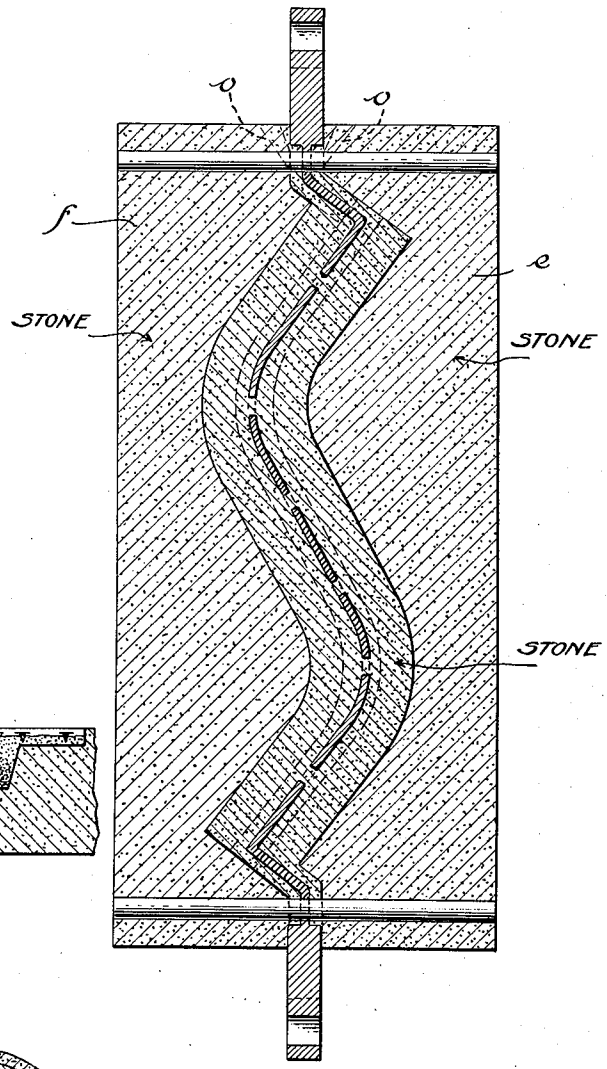
Oct. 4, 1927. 1,644,368

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MATCH PLATE PATTERN

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Fig. 10.



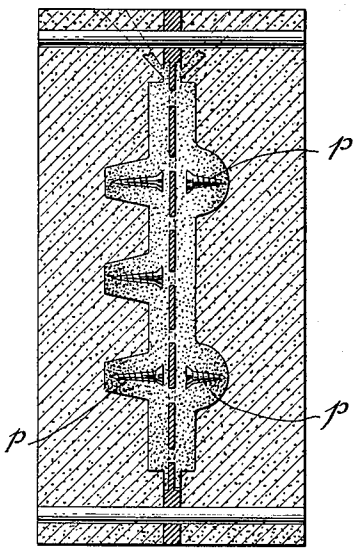


Fig. 12.

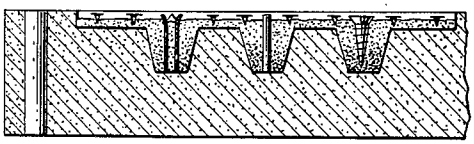


Fig. 13.

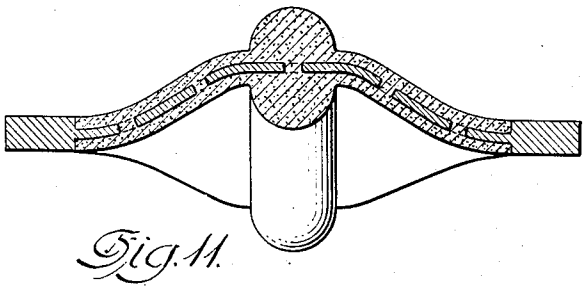


Fig. 11.

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Patented Oct. 4, 1927. 1,644,368

UNITED STATES PATENT OFFICE.

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MATCH-PLATE PATTERN.

Application filed May 23, 1925. Serial No. 32,325.

This invention relates to a cast stone pattern, and is particularly adapted to that form of patterns known as match-plate patterns. With my improvement a pattern of one half of the article to be cast is reproduced on one side of a metal plate and the pattern of the other half is reproduced on the other side of the plate.

It is customary at the present time to cast match-plate patterns out of brass, bronze, or other metals, and great care is taken in dressing these in order to make the pattern absolutely accurate. Manufacturers find that the cost of making these patterns amounts to a considerable sum. Furthermore, when a perfect match-plate is made, it is well nigh impossible to reproduce the same accurately, as the human element enters largely in the manufacture of these match plates.

With my improved form of match plate patterns, the process of manufacture is so simple that it is possible to reproduce the same accurately at any time, and at a very low cost. In addition, the composition of material which enters into the making of the match-plate is such that the same does not shrink or expand, is very hard and able to withstand considerable pressure, and possesses the characteristics which enable one to form a very smooth and highly polished surface on the pattern.

The object of the present invention is to provide a stone pattern which is suitably reinforced for withstanding the excessive pressures and strains which the same must undergo when put into a moulding machine.

It has been suggested that match plate patterns be made of plaster of Paris, Portland cement and other materials, but it is found that these are not successful.

I have chosen to illustrate a pattern as shown in Fig. 1 which has an irregular parting line, and consequently necessitates a reinforcing plate having an irregular contour, which must conform to the parting line. My process is in reality the casting of a stone pattern to a metal plate, the metal plate carrying all the strains, while the stone when sufficiently reinforced by this plate is capable of withstanding considerable pressure, maintains its shape, size and dimensions and does not deteriorate with age.

In the drawings:

Fig. 1 is a view in elevation of the master pattern without the match plate.

Fig. 2 is a section through a box showing the pattern placed therein and sand packed in the box up to the parting line and a plastic stone mix poured in above the sand.

Fig. 3 is a cross section on the line 3—3 of Fig. 2.

Fig. 4 is a view of the stone mould section and pattern set therein with the sand removed and the position of the mould reversed.

Fig. 5 is a similar section showing the plastic stone mix poured into the box to form the other mould section.

Fig. 6 is a cross-section showing the mould sections slightly separated.

Fig. 7 is a perspective view of the metal reinforcing plate.

Fig. 8 is a section taken on the line 8—8 of Fig. 7.

Fig. 9 is a section taken on the line 9—9 of Fig. 7.

Fig. 10 is a longitudinal section showing the two mould sections placed together and the metal reinforcing plate therebetween, showing how the stone pattern is cast to said plate.

Fig. 11 is a transverse sectional view through the completed match-plate.

Fig. 12 is a sectional view showing a modified form of match-plate where the parting line is straight and where the pattern is provided with a number of irregular projections.

Fig. 13 is a sectional view showing how the pattern having various densities is cast.

It is thought that the match-plate pattern and the construction thereof may be best understood by showing and describing the several steps of manufacture.

a designates a pattern which is provided with the irregular or curved parting line *b*. My first step in making stone mould sections for this pattern is the placing of the pattern in a box *c* containing sand with oil, or some other similar substance, and then packing the sand mix *d* in the box up to the parting line *b*.

After this sand is packed the plastic stone is then poured into the box over the patterns and fills up the remaining space in the box and forms a stone mould *e*. This stone is preferably what is known as oxy-chloride cement and is made of a mixture of 20% of magnesium oxide by weight, 30% of finely ground silica by weight, and 50% of 50 mesh silica sand by weight. To this dry mixture is added sufficient magnesium chloride in solution to form a pouring mixture or composition which may be readily poured.

The bottom of the box is knocked off and the sand removed, and the box turned over so as to position the stone mould *e* and the pattern as shown in Fig. 4. This stone mould *e* occupies the same relative position as does the sand in the initial step. The surface of the stone mould *e* is covered with an oil or other suitable parting material and the plastic stone *f* is then poured in the box over the pattern and the stone mould *e*. Due to the parting material the two stone moulds will not stick together but may be separated and the pattern *a* removed therefrom. Fig. 6 shows these two mould sections after the pattern has been removed and shows the mould sections slightly separated so that the construction can be more readily shown.

The next operation is the casting of the match-plate from these moulds. The moulds are separated and a reinforcing plate *g* is fitted between the moulds as is shown in Fig. 10. This match-plate is provided with an irregular central contour *h*, which conforms to the parting line of the pattern. This plate *g* may be cast or formed in any suitable manner and is provided with the recessed central portions *i* in which are a plurality of holes *j*. It will be seen from the drawing by referring to Figs. 8 and 9 how the recess on both sides of the match-plate leave a relatively thin central web portion and an enlarged outer frame *k*. This plate carries the ears *m* which are provided with the holes *n*, so that the match-plate can be correctly located on the dowel pins carried by the mould box.

These mould sections are coated with any suitable parting material and additional stone is poured between the mould sections, as is shown in Fig. 10 through the sprue openings *o*. This stone is allowed to set and harden and when the same is set the mould sections *e* and *f* may be removed and the match-plate is complete. Such a completed match-plate is shown in section in Fig. 11 and shows one-half of the pattern as cast on one side of the metal plate *g* and the other half of the pattern cast on the reverse side of the plate *g*. This match-plate is provided with a pattern formed in stone and the metal plate *g* is imbedded in this stone for reinforcing the same, the stone permitted to flow through the openings *j* in the plate for the purpose of keying the stone which lies on both sides of the plate together.

In Fig. 12 I show a modified form of match-plate in which the parting line is straight and which therefore does not necessitate an irregular reinforcing plate. The method of forming the moulds when the parting line is straight is a simpler operation and is described in detail in my copending application, Serial No. 33,648. In this modified view I show a match-plate which is provided with a number of projections *p*. These projections which are in the pattern are formed of stone and suitable reinforcing devices *r*, such as screws or rods, are embodied in the stone to prevent the projections from being easily broken off. It is preferable to so cast the pattern as to form an artificial stone of various densities. This is shown in Fig. 12 by showing a darker shade to the section near the outer edge of the match-plate. This provides a harder and stronger wearing surface to the match-plate pattern and obviously prolongs the life of the match-plate. Obviously, there are various methods by which the density of the moulded pattern which is cast to the metal plate may be varied to obtain a denser portion near the surface.

Fig. 13 shows how this type of pattern may best be made. A plastic mix of oxy-chloride cement is first poured into the mould section and fills up the depressions and covers the surface of the mould cavity. This is allowed to partially set or until the same will not run when the mould is set up on end. During this setting of the stone, the heavier particles of sand in the cement mix will sift to the bottom, and when hardened we find a denser mixture at the bottom which is the outside or wearing surface of the pattern. The large headed tacks 10, or other suitable fastening devices, are thrust in the first stone mix when partially set so when the rest of the stone is poured in, as in Fig. 12, the new stone is keyed to the stone which was first poured in and allowed to set.

Another important feature of the metal reinforcing plate is that it should have a contour to conform with the parting line, whether the parting line is straight or irregular. With such a reinforcing plate it is seen from the drawings that the match plate extends the entire length and breadth of the pattern, and therefore practically all the strains are absorbed by the metal reinforcing plate. The construction of the plate is such that the outer peripheral edge of the pattern is entirely metal, while the central portion of the pattern, which is cast to said plate, may be a more fragile material, such as stone.

I find it advisable to paint the moulds with a thinner solution of my oxy-chloride mix, the ingredients of which I have given above. The cavities are first painted with this in order to remove small air pockets in the surface, and also to prevent a wavy surface in the pattern due to the pouring, causing a lapping action as the fluid runs along the surface of the cavities. Then follows, ordinarily, the pouring of the mix into the deep cavities of the mould and allowing it to set partially before the two mould sections are placed together. It is at this time that the reinforcing studs or members may be placed in the mould.

I desire it to be understood that I have used the term "metal plate" in its broadest significance as a reinforcing member. Obviously the metal plate may be so perforated as to be in effect a wire mesh, as is described and claimed in my co-pending application Serial No. 42,940, filed July 11, 1925. This application is intended to be a generic application in which "plate" is used in its broad significance to indicate any reinforcing member imbedded in the pattern to give it tensile strength.

I wish it also understood that the pattern does not need to be cast on both sides but that the claims are to be read as though the pattern were on one side or both sides. With heavy castings it is in fact customary to provide two match plates, one carrying half the pattern and the other carrying the other half. Obviously my pattern may be cast on one side of a plate, or reinforcing member, with slight modifications such as projections to support the pattern.

The master pattern referred to may be either the original wooden pattern, or if the wooden pattern is covered with an objectionable shellac that might make it stick in the stone moulds, I can first make an impression of the wooden pattern in plaster of Paris and from this plaster of Paris mould cast an exact reproduction of the wooden pattern by means of my oxy-chloride mix. This reproduction of the wooden pattern then becomes the master pattern to be used in forming the stone moulds.

What I claim is:

1. A pattern of mouldable stone composition material and having reinforcing match-plate embedded therein and keyed thereto.

2. A pattern of hardened artificial stone material and having a reinforcing plate of metal embedded therein with the pattern on both sides of the plate.

3. A pattern for use in moulding and formed of oxy-chloride cement comprising magnesium oxide, silica and magnesium chloride.

4. A pattern comprising a perforated and recessed metal reinforcing plate and a cast stone pattern secured to said recessed portion of said reinforcing plate.

5. A pattern comprising a reinforcing match-plate and a moulded artificial stone pattern cast-united to said reinforcing plate, and comprising a composition, containing magnesium oxide, silica and magnesium chloride.

6. A pattern comprising a reinforcing metal match-plate having a recessed central position, and a moulded stone pattern secured to said recessed central portion, thereby providing a match-plate having peripheral edge of metal serving to protect and reinforce the moulded pattern.

7. A pattern of unit cast mouldable material and having various densities, the densest portion located at the wearing surface of the pattern to strengthen the same.

8. A pattern formed of hardened cementitious material of various densities, the heavier particles of said cementitious material being sifted to the outside surface of said pattern, thereby forming a cementitious match-plate having a denser portion near the outside or wearing surface of the pattern.

In testimony whereof I have affixed by signature.

LLOYD G. COPEMAN.