B. D. LOCKWOOD.

DIE.

APPLICATION FILED APR. 15, 1919.

1,351,048.

Patented Aug. 31, 1920.

2 SHEETS—SHEET 1.

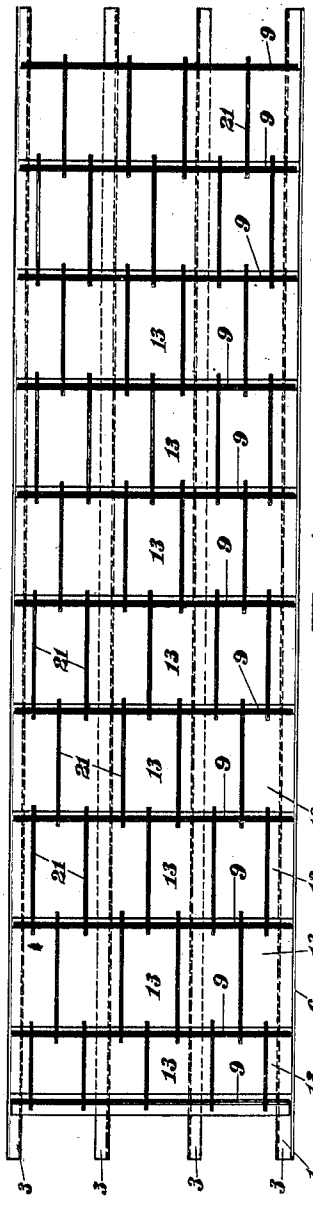


Fig. 1

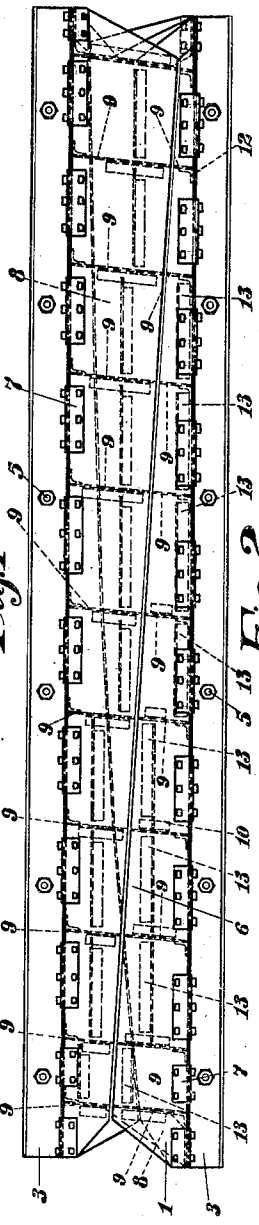


Fig. 2

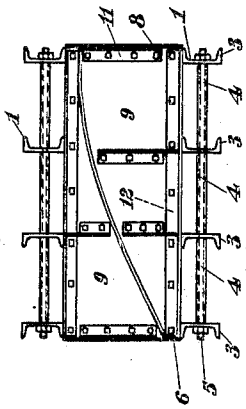


Fig. 4

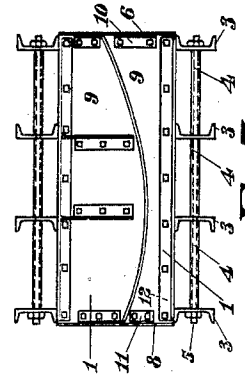


Fig. 3

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2 SHEETS—SHEET 2.

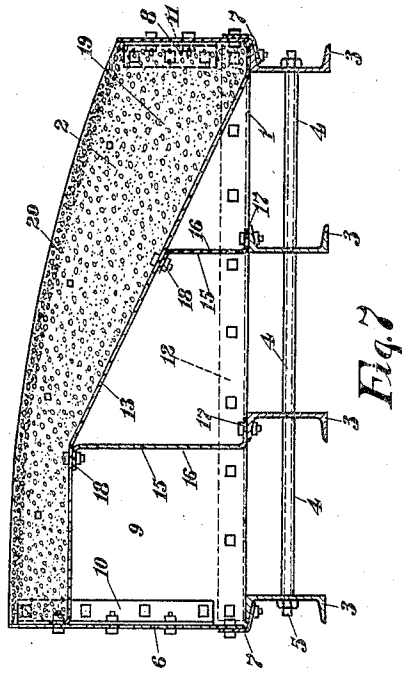


Fig. 7

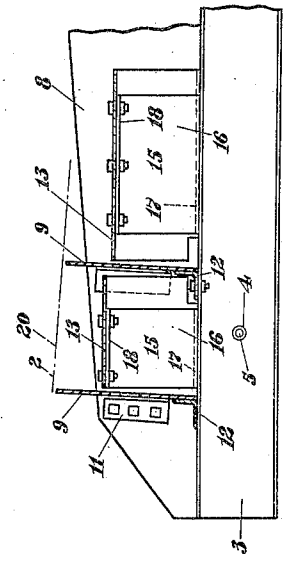


Fig. 8

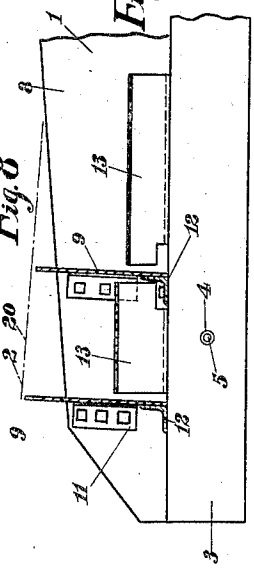


Fig. 9

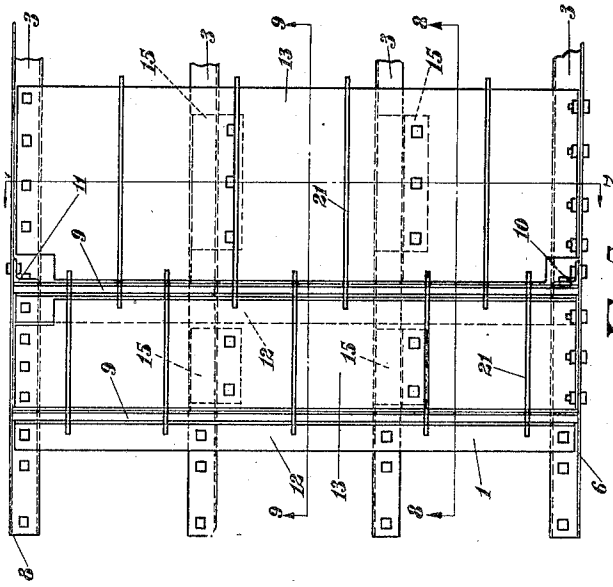


Fig. 5

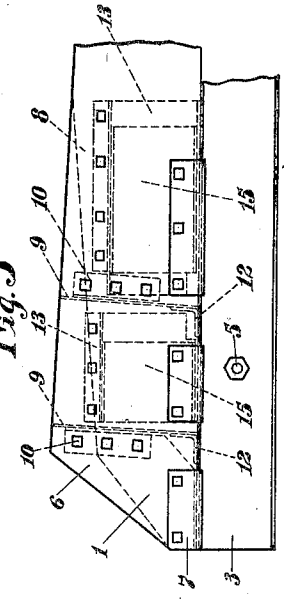


Fig. 6

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UNITED STATES PATENT OFFICE.

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DIE.

1,351,048. Specification of Letters Patent. Patented Aug. 31, 1920.

Application filed April 15, 1919. Serial No. 290,289.

To all whom it may concern:

Be it known that I, BURNS D. LOCKWOOD, a citizen of the United States, residing in Bellevue, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Dies, of which the following is a specification.

An object of the present invention is to provide a die for shaping metal, which die is of light and simple construction, cheap to manufacture and efficient.

Another object of the invention is to provide a die having a pressing face portion of initially plastic material which, when hardened, is heat and pressure resisting.

Another object of the invention is to provide a composite die comprising a metallic base and initially plastic material, said material when in its hardened state, forming the face of the die and being adapted to resist heat and pressure.

Another object of the invention is to provide a composite die comprising a metallic base and initially plastic material, said material, when hardened, forming the pressing portion of the die, the material forming the pressing face of the die being of such a composition as to resist wear, heat and pressure.

A still further object of the invention is to provide a composite die having a metallic base and a reinforced concrete filler.

These and other objects will be apparent from the following specification and claims.

Referring now to the drawings in which like reference characters refer to like parts, Figure 1 is a plan view of the metallic base of the die with the filling material omitted; Fig. 2 is a side elevation view of a top and bottom die constructed in accordance with the invention; Fig. 3 is an end elevation view of the left hand end of the same; Fig. 4 is an end elevation view of the right hand end of the same; Fig. 5 is an enlarged detail view of a portion of the metallic base, the filling material being omitted; Fig. 6 is a side elevation view of the same; Fig. 7 is a cross sectional view taken of the line 7—7 of Fig. 5, the filling material being illustrated; Figs. 8 and 9 are longitudinal sectional views taken on the lines 8—8 and 9—9 respectively, of Fig. 5.

Referring now in detail to the drawings 1 indicates the base or framework of the die which is filled with concrete 2 or other suitable initially plastic material. The base or framework 1 comprises members 3 which extend longitudinally of the die and are spaced apart throughout their length by transverse members 4 which are mounted on transverse bolts 5. These members 3 may be of any suitable form in cross section and may be either of rolled, pressed or other suitable section, but as shown in the drawings are preferably rolled sections of channel form and have their webs disposed vertically and their top and bottom flanges disposed horizontally. At one side of the die a plate 6 is provided which is preferably disposed vertically and is preferably connected with one of the outer longitudinal members 3 through the medium of angular members 7, one flange of each of which is secured to the lower edge portion of the plate and the other flange is secured to the upper flange of the longitudinal member 3. At the opposite side of the die a similar plate 8 is provided which is also preferably disposed vertically and is connected to the other outer longitudinal member 3 through the medium of the angular member 7 in the same manner as that just described in connection with the plate 6. It will here be noted that instead of making the angular members 7 at each side of the die in a plurality of pieces they may be made in one piece or if desired may be dispensed with and the plates 6 and 8 provided with integral lower flanges which may be secured to the longitudinal members 3. To strength and stiffen the die as a whole plates 9 are provided which extend transversely of the die, one end portion of each plate being connected with the side plate 6 through the medium of an angular member 10, and the other end portion being connected with the side plate 8 through the medium of an angular member 11, while the lower edge portion of the plate is connected with the members 3 through the medium of an angular member 12. It will be understood that these angular members 10, 11 and 12 may be dispensed with and the plates connected with the component parts of the framework by any other suitable means.

Between the plates 9, plates 13 are provided which are preferably horizontally disposed in a direction longitudinally of the die and which extend transversely of the die for substantially its full width, the end portions

of such plates being secured to the side plates 6 and 8 or to the longitudinal members 3. The side plates 6 and 8, transverse plates 9 and the plates 13 form pockets or sections which are filled with concrete 2 or other suitable initially plastic material, which when set forms the face portion of the die. The plates 13 form the bottoms of the pockets or sections and are so shaped as to maintain as nearly as desired a uniform thickness of concrete throughout the length and width of the die. To support these plates 13 intermediate their ends, members 15 are provided which may be of any suitable form in cross section, but as shown in the drawings are preferably of Z-shape having their webs 16 disposed vertically and their bottom flanges 17 disposed horizontally and secured to the longitudinal members 3. The top flanges 18 of these members are secured to the plates 13 and are formed to correspond to the shape of the plate 13 at the place where they contact with such plate. The plates 13, of the die illustrated in the drawings, vary in form in cross section throughout the length of the die, this being due to the varying contour of the face portion of the die, but it will be understood that when the contour of the face is the same throughout the length of the die, all of the plates 13 may be identical.

The concrete or other filling 2 comprises a lower or base portion 19 and an upper or pressing face portion 20 which portions are united. The base portion 19 is of concrete preferably composed of a mixture of slag sand and metal borings, the binding medium being preferably cement and water, all in suitable proportions. When these materials are mixed, they form an initially plastic mass, which while in its plastic state is deposited in the pockets formed by the plates 6, 8, 9 and 13 until the top of the material is within a short distance from the tops of such plates; the mass is then permitted to harden. After this portion 19 has set or hardened sufficiently, a mixture of metal borings, a binding medium preferably cement and a saturated solution of ammonium chlorid, while in its plastic state, is deposited in the pockets referred to above on top of the portion 19. The desired contour of the pressing face of the die is then formed on this mass and then left to set or harden after which the die as a whole is preferably baked to drive out the remaining moisture in both mixtures. This mass is of such a composition as to produce a pressing face having the heat, wear and pressure resisting properties desirable in this portion of the die.

To reinforce the pressing portion of the die, reinforcing members 21 may be provided, the ends of such members being mounted in the plates 9. These members may extend continuously throughout the length of the die or as shown in the drawings may be in short lengths.

It will be understood that minor changes may be made in the construction of the die without departing from the spirit and scope of the invention as set forth in the appended claims.

Having thus described the invention what I claim as new and desire to secure by Letters Patent is:

1. A die for shaping metal plates having a hardened pressing face portion comprising granular base materials and a medium for binding said materials together, said face portion being heat resisting.

2. A die for shaping metal plates having a hardened pressing face portion comprising granular materials and a binding material for said materials said face portion being heat and pressure resisting.

3. A die for shaping metal plates comprising a granular base material and a medium for binding said material, the pressing face portion of said die being heat and pressure resisting.

4. A die for shaping metal plates comprising a hardened initially plastic material, said material comprising granular material and a medium for binding said material, and metal reinforcing means in said material.

5. A die comprising a metal base portion and a pressing face portion of hardened initially plastic material comprising granular base materials and a medium for binding said materials together.

6. A die comprising a metal base and a pressing face portion contained by said base, said face portion comprising metal particles and a non-metallic medium for binding said particles together.

7. A composite die comprising a base portion of metal and a pressing portion of hardened initially plastic material, said material comprising granular materials bound together by cement.

8. A die having a metal base in combination with a hardened pressing face portion, said portion comprising metal particles and a medium for binding said particles together and being of substantially uniform thickness throughout the die.

9. In a die, a metallic base, a hardened initially plastic material forming the pressing face portion of said die, said material comprising granular material and a binding medium for said granular material, said base portion comprising means so shaped as to maintain a minimum and substantially uniform thickness of said initially plastic material throughout said die.

10. A die having a metal base, and a hardened initially plastic pressing portion containing metal particles bound together

by cementitious material, said base comprising a means so shaped as to maintain a substantially uniform thickness of said pressing portion throughout said die.

11. In a die a base portion comprising longitudinal members forming the sides of said die, members extending transversely of said die and secured to said longitudinal members, horizontally disposed members between said transversely extending members, all of said members forming pockets in said base, and hardened initially plastic material in said pockets forming a pressing portion for said die.

12. In a die a base portion comprising longitudinal members forming the sides of said die, members extending transversely of said die and secured to said longitudinal members, horizontally disposed members between said transversely extending members, all of said members forming pockets in said base, hardened initially plastic material in said pockets forming a pressing portion for said die, and means mounted in and extending between said transverse members for reinforcing said material.

13. In a die, a metal base comprising longitudinal members longitudinal plates secured to said members and forming the sides of said die, plates secured to said longitudinal plates and extending transversely of said die, horizontally disposed plates extending betweeen said transversely extending plates, all of said plates forming pockets in said base, hardened initially plastic material in said pockets forming a pressing face for said die, and means for supporting said horizontally disposed plates intermediate their ends.

14. In a die, a metal base having pockets formed therein, an initially plastic material in said pockets forming the pressing portion of said die, said initially plastic material comprising granular materials and a bind-medium for said granular materials.

15. In a die, a metal base comprising flanged longitudinal members, longitudinal plates forming the sides of said die and connected with the outer flanged members, transversely extending plates between said longitudinal plates, horizontally disposed plates between said transverse plates, supports for said horizontally disposed plates secured to said plates and to the intermediate longitudinal members, said plates forming pockets in said base, and hardened initially plastic material in said pockets forming the pressing portion of said die.

16. A die having a metallic base concrete filling in said base and reinforcing members embedded in said filling.

17. A die having a metallic base, a hardened initially plastic filling in said base, the outer portion of said filling comprising united metal particles, and a cementitious medium for binding said particles together.

18. A die for shaping metal, said die comprising hardened initially plastic material, the pressing face portion of said die comprising metal particles and a binding medium and being of a different composition from the remaining portion of the die.

19. A die having a metallic base and hardened initially plastic material in said base, the inner portion of said material comprising slag sand and a binding medium and the outer portion of said filling comprising metal particles and a binding medium.

20. In a die, a metal base comprising members extending transversely of the die, material containing cement between said members forming the pressing portion of said die, and reinforcing members extending through said material and mounted in said transverse members.

21. In a die, a metal base, said base comprising members extending transversely of the die and dividing said base into a plurality of pockets, material containing hydraulic cement in said pockets forming the pressing portion of said die and reinforcing members extending through said material and mounted in said transverse members, the reinforcing members of adjacent pockets being staggered.

In testimony whereof I affix my signature in the presence of two witnesses.

BURNS D. LOCKWOOD.

Witnesses:
FRANK E. MILLER,
H. M. BENDER.