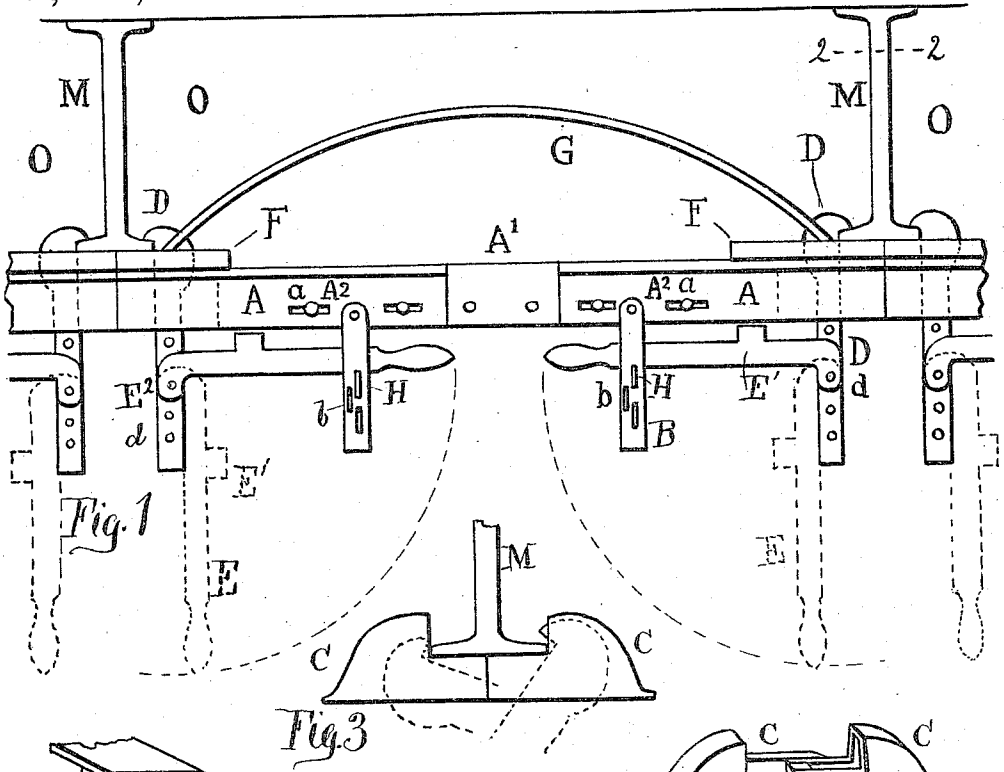
C. B. SMITH.

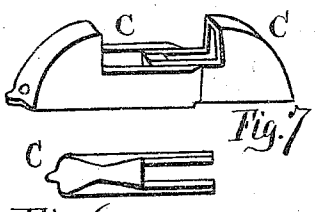
MOLD FOR FIREPROOF FLOORS.

APPLICATION FILED MAR. 26, 1914.

1,186,614. Patented June 13, 1916.







WITNESSES:

S. H. Stodder

Jack H. Smith

Charles B. Smith
INVENTOR.

BY Lyman D. Stetson
ATTORNEY.

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES B. SMITH, OF NEW YORK, N. Y.

MOLD FOR FIREPROOF FLOORS.

1,186,614. Specification of Letters Patent. Patented June 13, 1916.

Application filed March 26, 1914. Serial No. 827,458.

To all whom it may concern:

Be it known that I, CHARLES B. SMITH, a citizen of the United States, residing in the borough of the Bronx, in the city of New York, N. Y., civil engineer, have invented a certain new and useful Improvement in Molds for Fireproof Floors, of which the following is a specification.

The invention relates mainly to the holding up of the semi-fluid mass.

I will describe the plastic material to be molded as medium quality concrete.

I have devised a construction and mode of operation of the molding parts which improves the holding up of the form, serves to mold the lower portion of the concrete, and also aids in the removal of the form when the concrete is sufficiently "set" to stand alone. On large jobs a number of sets of the apparatus, sometimes running up into the hundreds, is required in order to be able to allow each to remain a sufficient time with the forms in place. The expense of supplying a large number is moderate. The strains are slight. All the parts of the several sets may be interchangeable. Much of the material may be wood. The whole lot except for accidents may be used again indefinitely with or without roughly cleaning.

The following is a detailed description of good means for carrying out the invention.

A number of sets of the apparatus are required to carry forward large enterprises with reasonable speed but as all may be alike a description of one set may serve for all. It will be understood that the parts at one end to serve on one girder or I-beam lie in the reversed relations to those on the opposite end.

I shall term all the parts of my apparatus which are applied and removed together and take care of the filling between one I-beam and the next as one double series.

Figure 1 is a nearly complete side elevation of one double series with a little of the adjacent series at each end. I will term the right and left of Fig. 1 the ends. The strong lines show the condition for holding to harden. The dotted lines show a commencement of the movements for withdrawing the apparatus. Fig. 2 is a horizontal section on the line 2—2 in Fig. 1. Fig. 3 is a corresponding side view of a portion in the act of being hooked or unhooked. The dotted lines on the left show the approximate position of the hook relatively to its I-beam, when my invention is being raised into position for work or is being lowered after an operation. The dotted lines on the right show the position when the hook is being turned or "rolled," to engage or release. Fig. 4 is a perspective view of some of the principal parts. It is devised to show clearly the construction and the action. It requires special explanation to inform the reader that it is an unusual attempt to show in the full strong lines of complete representation, the parts holding like Fig. 1 and also releasing like Fig. 3. Figs. 5 and 6 show what I term a "shield" detached, the former showing a perspective view and the latter a plan view of the shield. Fig. 7 shows in perspective two shields as they serve under one I-beam, forming part of one series.

Similar letters or figures or both indicate corresponding parts in all the figures where they appear.

I will describe the invention as applied to one of the stories of a large building making a floor of an ordinary long approved character.

M are the I-beams strongly and permanently supported as usual upon the base members F, the concrete being molded in the space O between each and the next.

A are straight angle-irons bolted permanently together.

A^1 are splice pieces of plane steel and A^2 are bolts and nuts inserted through slots "*a*" which may be shifted and readjusted to adapt the invention to a wide range of distances apart of the I-beams. The two angle irons are held a sufficient distance apart and the free space between not occupied by the splice-pieces accommodates two hooks D which may be moved up and down and inclined as required.

E is a hand lever secured by a pivot E^2 at its bent end extending through a hole *d* at the proper level on the shank of the hook.

Each hook D has a number of holes *d* and is loosely covered by a pair of matched shields, CC, one sufficiently wider than the other to partially embrace it, each partly circular in outline and thinner laterally at the top than at the bottom. The hook is peculiarly perforated and performs important functions. These shields are secured to the base members F, see Fig. 4, in any suitable manner, as by means passed through openings in the ends of the shields. One of

these openings is seen at the left of Fig. 7. The arrangement allows the pivot and its lever to be adjusted up and down on the hook.

The lever E has a short spread arm E^1 on its upper side. Its handle and body is thin enough to play easily between the two parallel links B, which links are slotted as shown by *b* and are attached to AA by a pivot.

H is a taper key driven through the proper slots and capable of being adjusted up and down to correspondingly hold the connected hook.

When the parts are properly placed and all is ready the operator lifts the handle at the free end of the hand lever E and guides it between the links B and presses such lever upward until its arm E^1 engages under the angle-bars A and their splice piece A^1 and serves as a fulcrum to draw downward the hook D as the handle of the lever E is forcibly lifted and secured by the key H.

G is an arch having the required curvature applied from above, abutting against the bottom flanges of the I-beams. This arch is of thin but rigid material, it may be wood faced on the upper side with thin steel. It is notched to allow for the shield. Now the whole of the space between the beams which lies above the arch G or any portion of the width of such space may receive its filling of concrete and be gently rammed if desired. The slowly hardening concrete must now of course remain undisturbed until it has "set" sufficiently to maintain its shape.

If hollow tiles are employed in the filling, the invention is applied in the same way, simply sinking the lighter tiles of the proper size and shape into the space provided for the filling and supplying only the remainder of such space with the plastic material.

After a delay of a few days the parts are operated to remove my apparatus. It can best be done while the freshly molded concrete is still green but hard enough to maintain its form. The key "H" is extracted, the lever "E" may drop a little by gravity, the operator forces it down farther, until it lies vertically along-side the shank of the hook "D." This condition is shown in the dotted lines in the lower part of Fig. 1. Force should now be applied as required at each end to liberate the hooks and allow my temporary parts to drop completely away. It will be often the case that the work will stick. Now one pulls the hand lever of the left end to the left as shown by the inclined position in Fig. 4, while another pulls the corresponding hand lever of the right end to the right. Each hook forcibly makes a partial revolution, the left one has its bottom swung to the left and its hooked top to the right, which effects the unhooking.

The arrangement of the levers "E" gives the advantage that the power of the hand may be applied to promote the engagement of the hook and also that the same power may be applied under the very different conditions of the material in extracting the hook from its engagement and liberating the parts, a few days later. The fulcrum on which each lever thus turns in the liberating act, and the same in the less difficult act of attaching, can vary automatically to meet the changes in the strain, but each is always near the edge of the bottom flange of its respective I-beam. The long arm may extend down 30 inches while the short arm has very little appreciable length.

It is frequently desired to not only fill with the concrete the whole or a principal portion of the space between the I-beams, but also to let the concrete lie about an inch under each I-beam, and to also flow it to about the same amount above the top of the I-beams. This protects the iron from becoming so soon heated in case of fire above or below.

I attain the first condition by means of a bottom part of the shield holding the string pieces AA adjusted at a proper distance below the I-beam making the adjustment of the other parts to correspond. The effect is that the concrete will leak through so little as to leave a sufficient cavity underneath the I-beam in which the tails or shanks of the hooks D may rise sufficiently in the act of liberating the parts after the concrete is hardened.

When the operation is complete, and the straight angle irons A and the board F and their several attachments, all except the shield CC, are removed, by being lowered, the shields will remain in place and sometimes require considerable labor to detach them but it is easy to get access to them now. Certainly there will be the following operations to be performed by hand: First the filling with a trowel by hand of the space under the I-beam which was protected so that it could not be properly filled before, and second the filling the spaces where the shield had been.

The top of the I-beam may be covered to any required depth, by supplying an excess of the concrete and leveling it in the ordinary manner.

The circular form of the interior of the shield and the corresponding smaller circular form of the working portion of the hook "D" is important, the shield allows the rolling to be effected even if the plastic concrete has intruded and hardened within. The circular form of the corresponding part of the hook "D" contributes to the same end.

After the hook has been rolled out of its

engagement with the I-beam at each end, the parts forming my invention may be carried to a new place and be used again.

Modifications may be made with various qualities of cement and stone without departing from the principle or sacrificing all the advantages of the invention. Parts may be omitted, such as the adjustment for different distances between the I-beams. I can omit the thin arch G especially when using tiles. The invention will apply with some success to roofs and to horizontal or moderately inclined partitions of any name or for any purpose. I use the word "floor" to indicate any analogous part of a building.

Observe that the shield C performs three functions, first it acts as a gage for the thickness between the I-beam and the parts below, second it preserves a cavity into which the hook may be lifted in the act of turning it to liberate the whole, and third it acts as a shield to protect the hook from adhesion. Despite the oiling concrete is liable to stick to iron. The shield can be liberated at leisure after the other parts have been removed, but the hook cannot be reached since the shield protects it almost entirely. The shield can be made to fit tight enough to the carefully and smoothly notched arch without leaking down to make serious disturbance.

I claim as my invention:

1. In a support for the molding of fireproof floors, hooks engaging girders for supporting cross members, and shields comprising oppositely disposed hollow parts adjustable with relation to each other, each part having its upper portion fitted over one of said hooks to protect the same during the pouring of the mold, the parts being fitted with approximate tightness and adapted to be separated upon giving a rolling motion to the hook to withdraw the point.

2. In a support for the molding of fireproof floors, hooks engaging girders for supporting cross members, and shields comprising oppositely disposed hollow parts adjustable with relation to each other, each part having its upper portion fitted over one of said hooks to protect the same during the pouring of the mold, the parts being fitted with approximate tightness and adapted to be separated upon giving a rolling motion to the hook to withdraw the point, each shield having its lower portion made with corresponding parallel surfaces to serve as a gage to determine the thickness of the bottom layer of the fireproof material.

3. A support for fireproof material to be molded in place to constitute a floor, comprising a hollow shield with rounded portion and an extension to engage beneath a beam, a lever having a short spread arm on its upper side and made in two parts, one of which is hook form at the top, having its upper portion fitted to the rounded part of said shield and arranged to perform the double function of gripping the lower flange of the I-beam and holding for any period and by being turned to liberate itself from the I-beam adapted to be driven into holes in guide links and also adapted to receive a strong rolling motion to withdraw it.

4. In a support for fireproof material in a floor the combination with the hook arranged to engage and release an I-beam and a closely fitting hollow shield having an extended portion to engage beneath a beam and an interior form of circular section adapted to allow the hook to be withdrawn by rolling motion without disturbing much material.

5. In a mold for fireproof floors, a hook carried on one part engaging another part by rolling motion, a lever controlling such hook being fastened thereto by a pivot, links receiving such lever and having perforations and a crosskey to serve therein all arranged to allow the lever to escape by withdrawing the crosskey and to serve in the opposite direction as a longer lever to give it more leverage in disengaging.

Signed at New York city, in the county of New York and State of New York, this 25th day of March, A. D. 1914.

CHARLES B. SMITH.

Witnesses:
S. H. STODDER,
THOMAS DREW STETSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents Washington, D. C."