

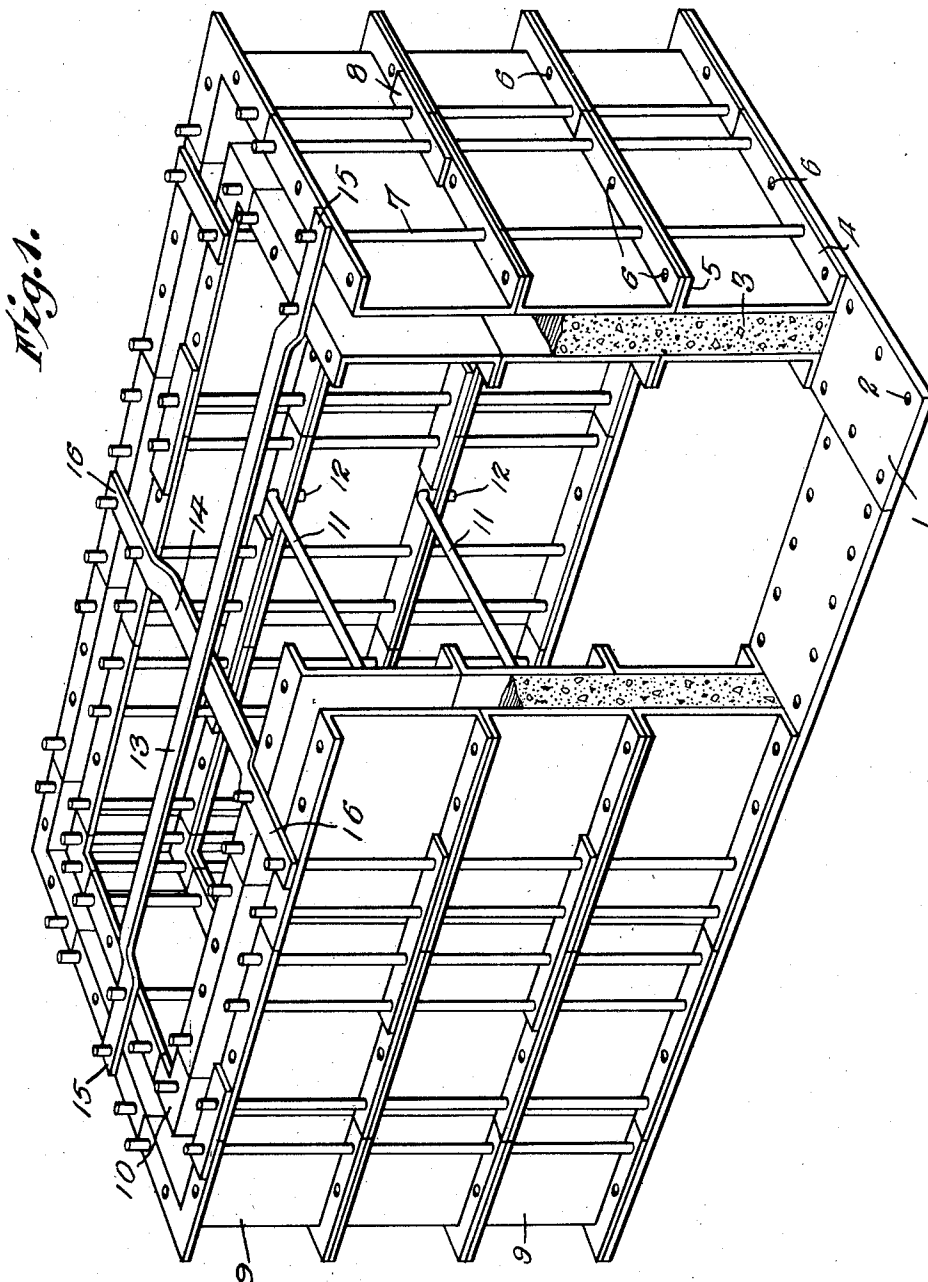
April 6, 1926.

A. K. KNICKERBOCKER

1,579,822

TOY

Original Filed March 23, 1923 3 Sheets-Sheet 1



Witnesses.

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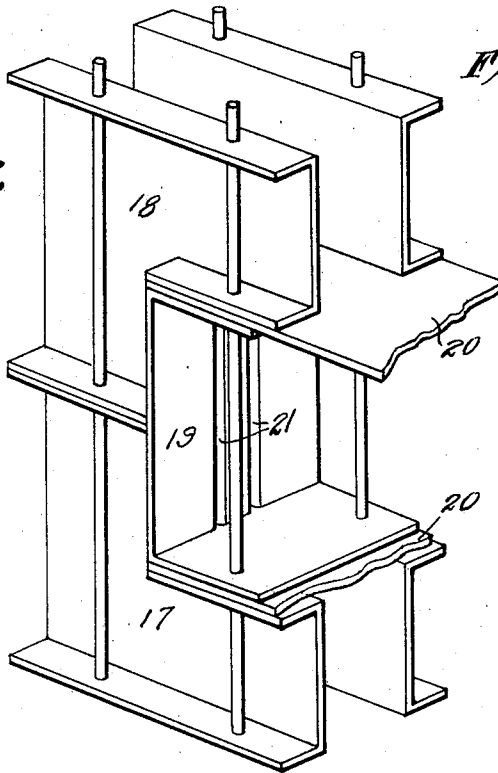
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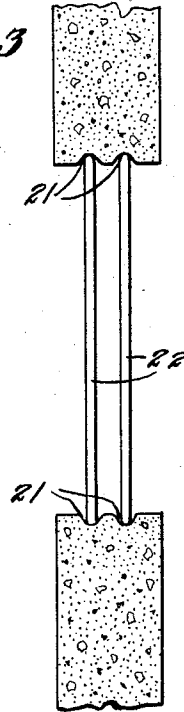
Original Filed March 23, 1923

3 Sheets-Sheet 2

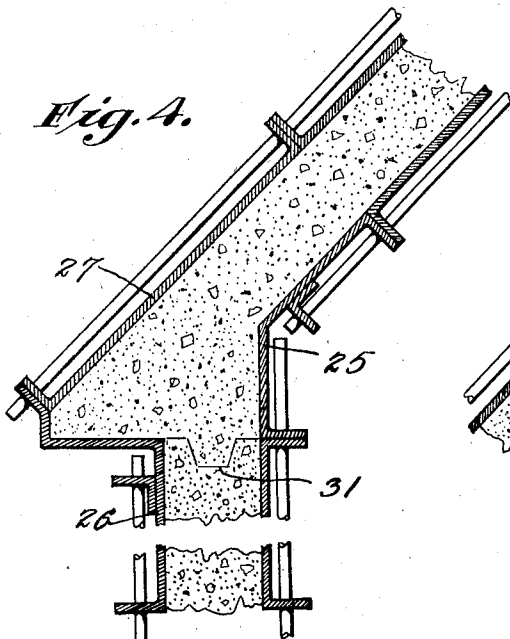
*Fig. 2.*



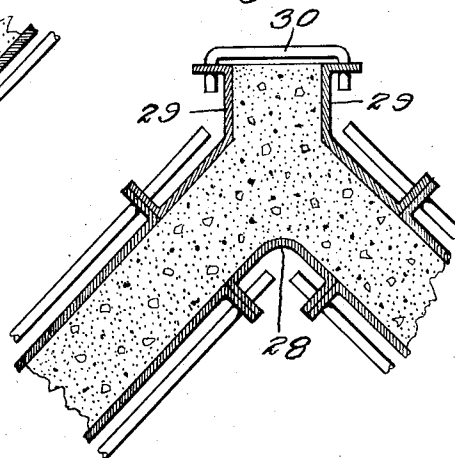
*Fig. 3*



*Fig. 4.*



*Fig. 5.*



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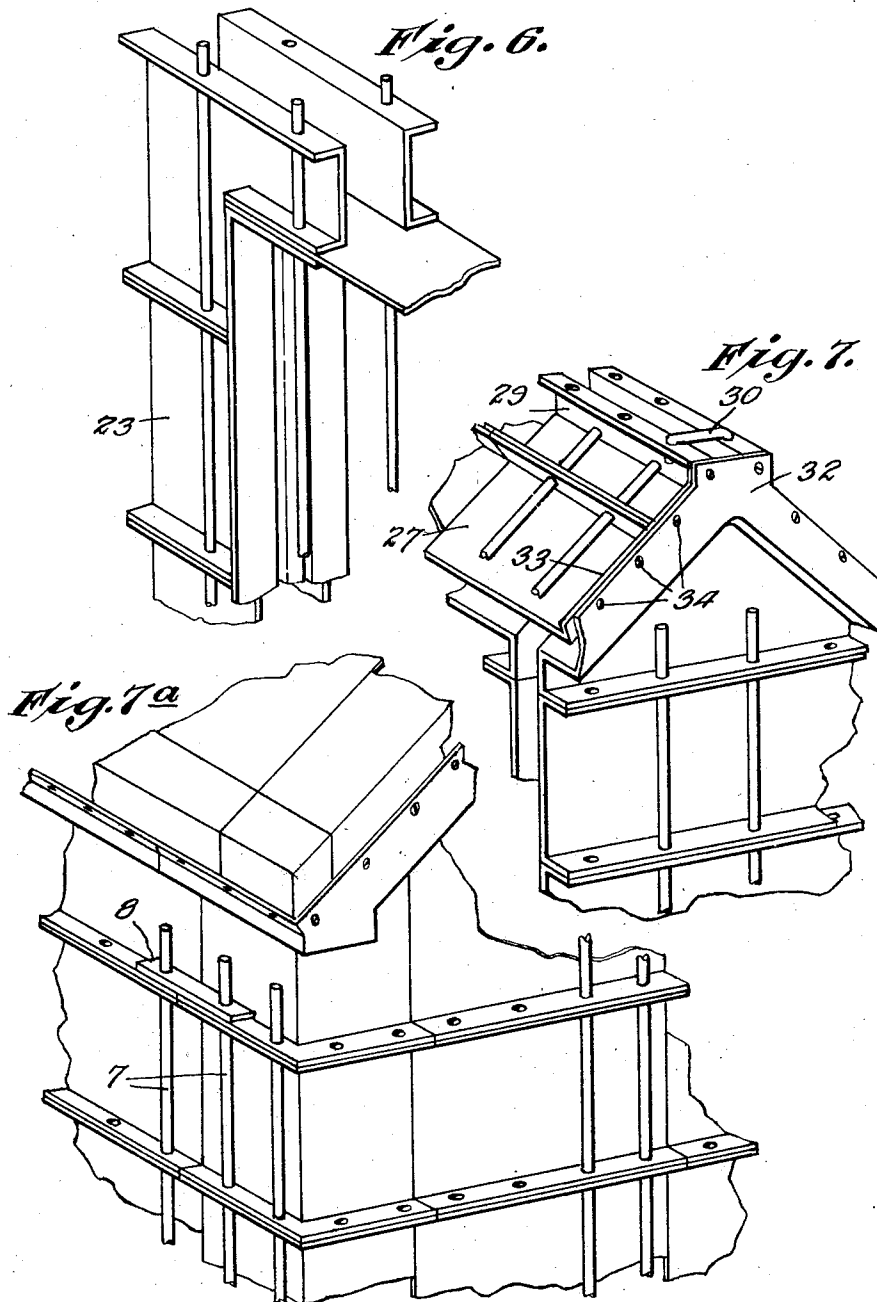
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Original Filed March 23, 1923 3 Sheets-Sheet 3



Witnesses.

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## UNITED STATES PATENT OFFICE.

ARTHUR K. KNICKERBOCKER, OF CROSBY, MINNESOTA.

## TOY.

Application filed March 23, 1923, Serial No. 627,148. Renewed January 9, 1926.

*To all whom it may concern:*

Be it known that I, ARTHUR K. KNICKERBOCKER, a citizen of the United States, residing at Crosby, in the county of Crow Wing and State of Minnesota, have invented certain new and useful Improvements in Toys, of which the following is a specification.

This invention relates to certain new and useful improvements in toys, and more particularly refers to that class of toy which is designed to stimulate the imagination of a child along the lines of building and constructive work.

Heretofore, the only building blocks used for toys were the ordinary building blocks, and while these give the child a certain amount of pleasure and amusement, it teaches him nothing in the way of the mixing and making of concrete structures.

One of the objects of my invention, therefore, is to provide for the instruction of children, more especially those between the years of eight and seventeen, in the art or practice of the manipulation of concrete material for building purposes and to advance the inventive instinct of the child so that it may vary the structures it builds in length, breadth and shape.

Another object of my invention is to provide simple and suitable forms for the construction of miniature concrete structural work so designed that while securing a great variety of structures, such as houses, barns, walls, bridges, etc., will require the child, after having used the plates, etc. to form the frame, to mix the concrete and to pour it into the forms as it is done in real life in the building of concrete structures.

One of the features of the invention is the make-up of the wall plates, which consists of a flat bar or plate of metal, the upper and lower side edges of which are bent at right angles to its body and each provided with a series of equi-distantly located apertures for the reception of the bracing bars. This make-up or design of the wall plate is seen throughout practically the entire series of plates or bars constituting the toy, although

as in the roof members, some forms of the plates are varied to a considerable extent, the same design or pattern exists also in them.

A further object of my invention is to provide forms adapted to be removably attached, during the course of construction, to a base, but which after the pouring and setting of the concrete, can be readily detached and used again for the formation of another structure.

A still further object of my invention is to so construct my toy that it will have the advantages of great durability and yet marked simplicity as a whole and in respect of each of its component parts, so that its manufacture is economically facilitated both as regards production of the parts and their assembly.

With these and other objects in view which may be incident to my improvements, the invention consists in the parts and combinations to be hereinafter set forth and claimed, with the understanding that the several necessary elements comprising my invention may be varied in construction, proportions and arrangement, without departing from the spirit and scope of the appended claims.

In order to make my invention more clearly understood, I have shown in the accompanying drawings means for carrying the same into practical effect without limiting the improvements in their useful applications to the particular constructions, which for the purpose of explanation have been made the subject of illustration.

In the drawings:—

Figure 1 is a perspective view showing the assembled forms for the walls of a miniature structure, such as a barn, or house, with the roof off, and with one corner broken away so that the interior construction may be clearly seen;

Figure 2 is a perspective view of unit forms for a small opening or window;

Figure 3 is a horizontal cross section thereof through the finished window, showing the

side grooves for the window lights and the latter in place;

Figure 4 shows a cross section through the eaves of a roof;

5 Figure 5 is a cross section through the peak of a roof;

Figure 6 is a perspective view showing forms for the construction of a large opening, such as a window or door; and

10 Figures 7 and 7<sup>a</sup> are perspective views showing the forms used in the construction of a pitch roof.

A reference letter applied to designate a given part is used to designate such part wherever the same appears throughout the several views of the drawings.

Referring to Figure 1, the frame of the structure or building is designed to be of the shape of a hollow square or rectangle comprising foundation plates 1 provided with apertures 2, upon which plates the walls of the building are to be reared. The walls are designed to be hollow, comprising an outer frame and an inner frame each consisting of a series of metallic wall plates or side forms of a standard size, the body 3 thereof having its lower edge 4 and its upper edge 5 each bent at a right angle to the body, said edges being provided with a series of apertures 6. The foundation plates are of the same length and of the same width, including their edges, as the wall plates, and the apertures in the foundation plates and in the edges of the wall plates correspond one with the other. The height of the wall is determined by the number of the wall plates, the several plates being held together by round metallic bracing rods 7 which extend through the apertures in the edges of the respective plates. The inner wall construction is simply a duplication of the outer wall, except for the corner forms to be hereinafter described.

The adjacent ends of the wall plates are held together by small auxiliary plates 8 which are apertured and through which the bracing rods 7 extend, thus uniting the adjacent wall plates firmly together.

In addition to the above, I provide corner forms 9 and 10, the former being for the outside of the building, and the latter of the same configuration but somewhat smaller for the inside corner structure. These are held to the side frames by the bracing rods 7 in the same manner as the side frames are held together.

In order to give the walls more stability during the process of constructing the building, tie rods 11 having bent ends 12 are used between the inner walls, the ends of such rods passing downwardly through the apertures in the side forms so as to link the opposite inner walls together. Across the top of the walls are placed reinforcing cross bars 13 and 14, which hold steady both

the inner and outer walls. Said bars are flat in cross section. The reinforcing bar 13 has its central or body portion raised above the end portions 15, which are somewhat depressed and provided with apertures through which the bracing bars pass. The reinforcing bar 14 has its body or central portion depressed and its ends 16 somewhat raised and provided with apertures through which the bracing bars pass. The object in having the body portion of the bar 13 raised and the body portion of the bar 14 depressed is to enable the two bars to be readily placed at right angles one across the other without interference.

Referring to Figure 2, showing the structure designed for a small window, the same consists of frame-like forms 17 and 18 which have the same standard height and length as the side forms save for the cut-away portion, the two forms together making one opening of the size shown for the reception of the window form 19. Flat finishing plates 20 are positioned at the top and bottom of the window to close the completed form, which extends over into similar adjacent forms. As seen in Figure 3, the form 19 has pressed therein on each side, two grooves 21 for the purpose of receiving lights 22 for the windows; these lights may be made of either oiled paper or mica and are set within the grooves therein. When it is desired to make a larger window than that shown in Figure 2, or to make a door opening, one or more intermediate units, such as the units 23 shown in Figure 6, are used instead, and should it be desired to increase the width of the opening, the same may be done by inserting at the top and bottom between the forms numbered 17 and 18 in Figure 2, a form equal to the standard wall plates shown in Figure 1.

Figures 4 and 5 show sections through a roof at the eaves, and at the ridge respectively. The roof requires special units, such as inner eave unit 25 and outer eave units 26 and 27 shown in Figure 4, and inner ridge units 28 and outer ridge units 29 shown in Figure 5; the two upper ridge units of the roof are properly spaced and secured together at the ridge by a staple or bent bar 30.

These roof units are of a somewhat irregular configuration as compared with those heretofore shown and described, but they are provided each with upper and lower apertured edges through which the usual bracing rods are inserted to hold the forms in proper position.

In constructing forms for a gable, another special unit is provided such as 32 in Figure 7, the lower eave corner being shown broken away so as to show the interior. The roof forms are of unit construction and similar in general to the forms shown in

Figure 1, and are attached and held together in like manner, that is to say by the bracing rods. To give additional stability to the gable form, it is provided with a wing set 33, which is secured to the gable by bolts 34 passing through apertures in the respective adjacent roof members.

It is the intention of the inventor that the manufacturer shall furnish with each set of building forms, unit sacks of cement and sand and instructions for mixing these in proper proportions. After the forms for a wall, building or other structure are assembled by the child, he will mix up the concrete batch and pour it in the openings left between the inside and outside forms. When the concrete has set the forms may be easily removed by pulling out the bracing rods by which they are held together. In making a barn, house, or other structure where a roof is required, the wall plates are left in place until the whole structure is completed. The walls of the structure are poured first, and as seen in Figure 4, a groove 31 may be made lengthwise of the finished wall by means of a simple rod or tool to be furnished as a part of the toy outfit. When the concrete in the side walls becomes hardened, the reinforcing cross bars are removed. The roof forms may be then placed in position and the roof formed by pouring the concrete batch through the ridge opening, the groove 31 making an effective bond between walls and roof. If desired, the roofs may be reinforced with fine mesh wire laid in place after the inside roof forms are assembled and before the outside forms are positioned. The use of such reinforcing means would give the child additional instruction and experience in reinforced concrete practice.

When the concrete in the finished structure has set, the forms are removed; in case of the roof structure, the inside forms are removed by simply turning the building upside down, when all the bracing rods and forms may easily be detached.

While in the accompanying drawings but one type of toy structure has been shown, namely, a house or barn having a gable roof, the same principles and types of forms may be applied to the construction of any other common structures, such as office buildings, farm buildings, churches, silos, bridges, forts, etc., etc., it being intended to apply the use of forms of the type described, and the principles outlined, to the construction of all manner of structures.

In putting the toys upon the market, they will be manufactured and furnished in graduated sets, that is to say, in sets designed for the construction of the simplest structures for the small child, up to sets designed for more complicated designs as the child becomes a youth.

Each set will be shipped in a box or container together with a book of instructions and a few simple tools to aid the child in his work.

I claim:

1. In a toy of the character described, a wall plate for building purposes consisting of a metallic plate, the upper and lower horizontal edges of which are bent at right angles to the body thereof and provided with spaced apertures, forms for openings, adapted to be used with the wall plates, whose upper and lower edges are provided with apertures, and bracing rods which extend through the wall plate and the form for openings and hold the two securely together.

2. In a toy of the character described, a wall plate for building purposes consisting of a metallic plate, the upper and lower horizontal edges of which are bent at right angles to the body thereof, and provided with spaced apertures, and forms for openings to be used with the wall plates, whose upper and lower edges are provided with apertures, and finishing plates having apertures to be used above and below said form for openings, and bracing rods which extend through the wall plate, and the form for openings and the auxiliary plates and hold them securely together.

3. In a toy of the character described, a wall plate for building purposes consisting of a metallic plate, the upper and lower horizontal edges of which are bent at right angles to the body thereof and provided with spaced apertures, forms for openings to be used with the wall plates, whose upper and lower edges are provided with apertures, and finishing plates having apertures to be used with such forms for openings, flat foundation plates provided with apertures, upon which the wall plates rest, and bracing rods which extend through the wall plates, the forms for openings, finishing plates, and into the apertures in the foundation plates whereby the entire structure is securely held together.

4. In a toy of the character described, flat rectangular plates provided with a series of apertures along each long side, a series of wall plates for building purposes, consisting each of a metallic plate, the upper and lower horizontal edges of which are bent at right angles to the body thereof and provided with a series of apertures which correspond with the apertures in the foundation plates, and bracing rods which pass through the apertured edges of the wall plates and fit into the apertures in the foundation plates to hold the foundation plates and the wall plates securely together.

5. In a toy of the character described, flat rectangular foundation plates provided with a series of apertures on each long side, a se-

ries of wall plates for building purposes, consisting each of metallic plates, the upper and lower horizontal edges of which are bent at right angles to the body thereof and provided with a series of apertures which correspond to the apertures in the foundation plates, reinforcing cross bars with apertured ends which extend across the upper walls of the building, and bracing rods which pass through the apertured ends of said cross bars, the apertured edges of the wall plates and the apertures in the foundation plates and hold the several parts firmly together.

6. In a toy of the character described, flat rectangular foundation plates provided with a series of spaced apertures along each long side, a series of wall plates for building purposes consisting each of a metallic plate, the upper and lower horizontal edges of which are bent at right angles to the body thereof and provided with a series of spaced apertures which correspond with the apertures in the foundation plates, bracing rods which pass through the apertured edges of the wall plates and into the apertures in the foundation plates, and reinforcing cross bars which extend across the upper walls of the building having apertured ends lying in a different plane from the body of the cross bar, said cross bars being held in position by the same bracing rods which hold together the foundation plates and the wall plates.

7. In a toy of the character described, flat rectangular foundation plates provided with a series of apertures along each long side, a series of wall plates for building purposes adapted to be superimposed one upon the other, each consisting of a metal plate, the upper and lower horizontal edges of which are bent at right angles to the body thereof and provided with a series of apertures which correspond with the apertures in the foundation plates, bracing rods passed through the apertures in the edges of the wall plates, and into the apertures in the foundation plates, and reinforcing cross bars which extend across the upper walls of the building, having apertured ends, which cross bars are held in place by the same bracing rods which hold together the foundation plates and the wall plates.

8. In a toy of the character described, the combination with an interior wall and an exterior wall in spaced relation one to the other, said walls composed of a series of vertically disposed rectangular wall plates, the upper and lower horizontal edges of which are apertured, and reinforcing cross bars having apertured ends extending from side to side across the two spaced walls to assist in firmly holding the structure together, of auxiliary apertured plates extending from one wall plate to the adjacent wall plate in the same plane, of vertically extend-

ing detachable bracing bars passing through said apertured edges of the respective plates and the ends of the reinforcing cross bars, to unite said plates and bars into a firmly built wall structure.

9. In a toy of the character described, a mold for concrete buildings including an inner and outer supporting wall each spaced one from the other and formed of longitudinal and vertical wall plates comprising a metallic body with upper and lower apertured edges bent at right angles thereto, auxiliary apertured plates which extend beyond the longitudinal edges of the wall plates to the adjacent wall plates, and bracing rods which pass through the apertured edges of the wall plates and the auxiliary plates and detachably secure them one to the other to form a wall.

10. In a toy of the character described, in a mold for concrete buildings, mold sections each comprising a series of longitudinal and vertical wall plates having a metallic body with upper and lower apertured edges bent at right angles thereto, auxiliary plates extending beyond the longitudinal edges of the wall plates to unite such adjacent plates together, and bracing rods which pass through the upper and lower edges and the auxiliary plates and adjustably secure the building bars together.

11. In a toy of the character described constructed of an inner and outer section between which concrete may be poured, the combination with a wall plate for building purposes consisting of a metallic plate, the upper and lower horizontal edges of which are bent at right angles to the body thereof and provided with equidistantly spaced apertures, forms for openings, adapted to be used with the wall plates, whose upper and lower edges are provided with corresponding apertures, and bracing rods which extend through the wall plates and the forms for openings to hold the two securely together to form vertical inner and outer walls, of roofing plates of a construction like to the wall plates to form inner and outer roofing walls, other detachable bracing rods to hold the same in proper position, and intermediate eave plates connecting the inner and outer walls of the roofing plates with the vertical building plates.

12. In a toy of the character described constructed of an inner and outer section between which concrete may be poured, the combination with a wall plate for building purposes consisting of a metallic plate, the upper and lower horizontal edges of which are bent at right angles to the body thereof and provided with equidistantly spaced apertures, forms for openings, adapted to be used with the wall plates, whose upper and lower edges are provided with corresponding apertures, bracing rods

which extend through the wall plates and the forms for openings to hold the two securely together to form a vertical inner and outer wall, of roofing plates of a construction like to the wall plates to form inner and outer roofing walls, other detachable bracing rods to hold the same in proper position, intermediate eave plates connecting the inner and outer walls of the roofing plates with the vertical building plates, and detachable gable plates and ridge plates for the ends and top of the roof respectively. 10

In testimony whereof I affix my signature.

ARTHUR K. KNICKERBOCKER.