C. H. PAJEAU.

TOY CONSTRUCTION BLOCKS.

APPLICATION FILED JULY 8, 1914.

1,113,371.

Patented Oct. 13, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

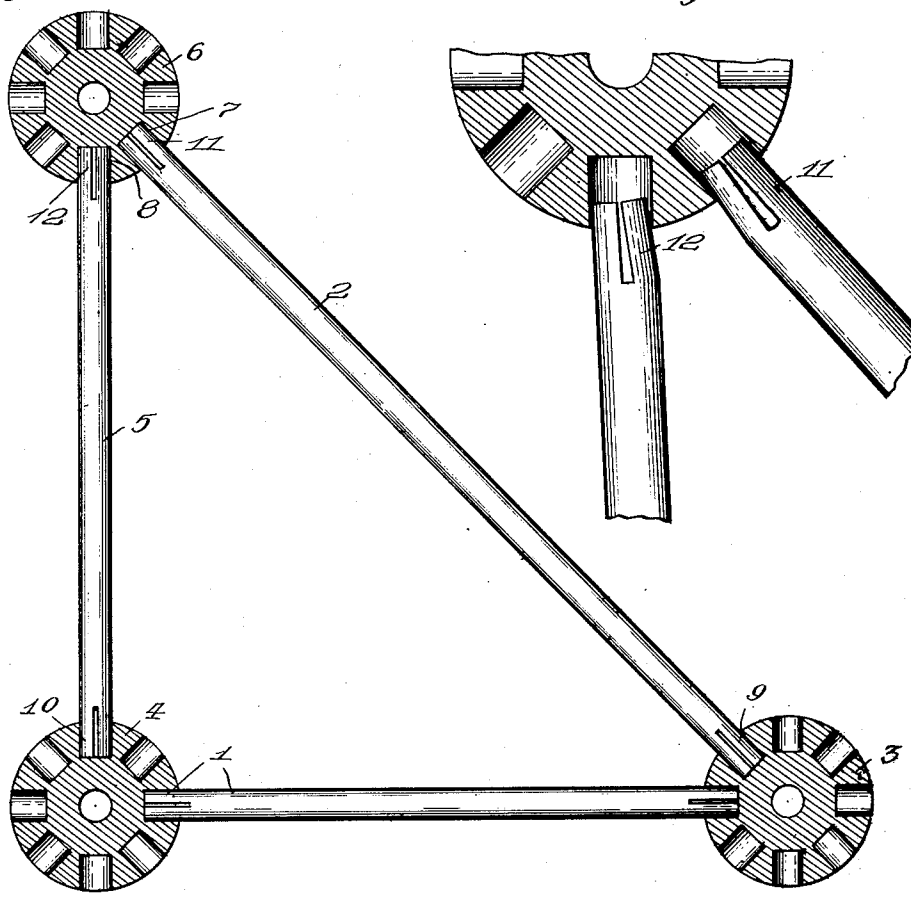


Fig. 2.

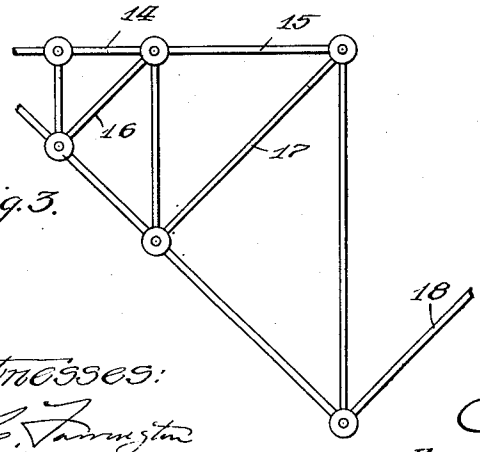
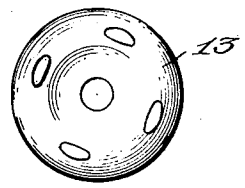


Fig. 3.

Fig. 4.



Witnesses:
T. L. Farrington
G. M. Neville

Inventor
Charles H. Pajeau
By Lotz & Scheith Attys.

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2 SHEETS—SHEET 2.

Fig. 5.

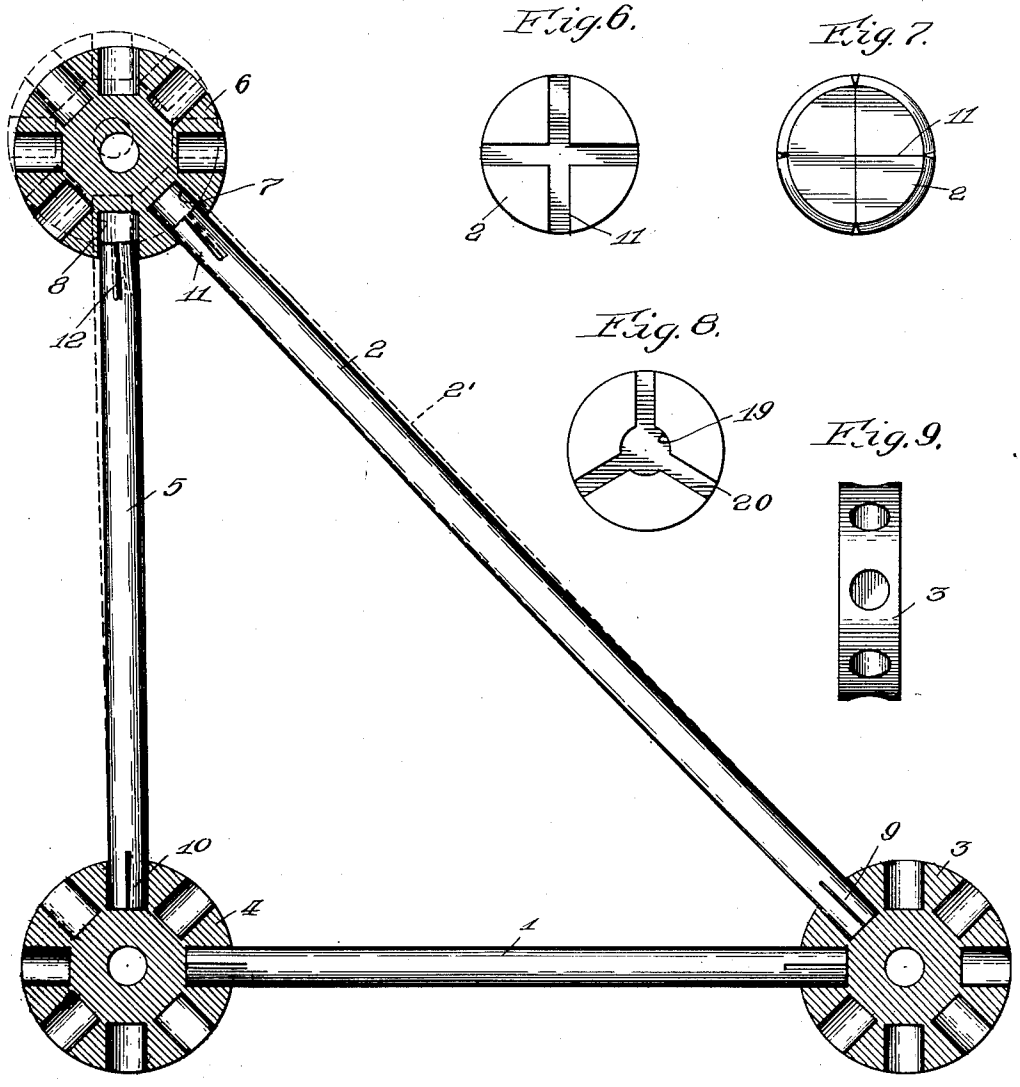

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

Witnesses:
F. L. Farrington
G. M. Neville

Inventor
Charles H. Pajeau
By Lotz & Scheibe Attys.

UNITED STATES PATENT OFFICE.

CHARLES H. PAJEAU, OF CHICAGO, ILLINOIS.

TOY CONSTRUCTION-BLOCKS.

1,113,371. Specification of Letters Patent. Patented Oct. 13, 1914.

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To all whom it may concern:

Be it known that I, CHARLES H. PAJEAU, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Toy Construction-Blocks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to toys and more particularly to toy construction blocks, its general object being to provide a series of simple, cheaply constructed and easily interlocked blocks which may be combined in an endless variety of ways to form miniature structures, furniture, implements or the like.

More specific objects of my invention are to provide rods and connecting members adapted to be adjoined with the rods disposed in various angular formations; to provide means for enabling such connecting members to be simultaneously adjoined to rods not parallel to one another; and to provide connecting members and rods adapted to be used jointly and having definite relations between the lengths of various rods and the socket constructions of the connecting members, thereby permitting the said elements to be joined in definitely predetermined combinations.

Other objects will readily appear from the following specification and from the accompanying drawings, in which:

Figure —1— is an elevation of three rods and a section through three connecting pieces joining adjacent ends of the rods. Fig. —2— is a fragmentary view showing the disposition of the adjacent ends of the rods when being simultaneously inserted in the sockets of one of the connecting members. Fig. —3— is a fragmentary elevation of a portion of a structure made with the blocks of my invention. Fig. —4— is an elevation of a spherical form of connecting member. Fig. —5— is a fragmentary view showing the means of enabling a third connecting member to be adjoined to a pair of rods maintained in substantially predetermined angular relation by their connection to other portions of the structure. Fig. —6— is an enlarged end view of one of the connecting rods. Fig. —7— is a similar end view of the same with the tip portions under maximum contraction. Fig. —8— is a view similar to Fig. —6— but showing an alternative arrangement of the slots in the rods. Fig. —9— is a side elevation of one of the disks of Fig. —1—.

In toy construction blocks, it has heretofore been feasible to use straight rods or sticks in combination with connecting blocks to only a limited extent, as it has been necessary either to limit the structures to right-angled formations, or else to equip the connecting blocks with perforations extending through the same and to slide one or more of the rods in each combination through one of these connecting blocks for substantially its entire length. By the latter means, it has been possible to provide combinations in which adjacent rods were disposed at acute angles, but the necessity of sliding at least one of the said angularly disposed rods entirely through the connecting block has made it impractical to insure a firm connection between the said block and the last-named rod, as the sliding demanded a loose fit while a firm maintenance of the resulting structure demanded a tight fit of the respective parts. In carrying out my invention, I have overcome this difficulty primarily by equipping each of the rods with yielding end formations which may be contracted so as to permit each of said ends to be introduced into a socket or bore in one of the connecting pieces when presented out of alinement with the said bore, and by providing the said end formations with such resiliency as to cause them normally to expand to the diameter of the bore of one of the said sockets so as to firmly engage the latter. I have also further facilitated the combining of elements in angular formations by providing a limited amount of flexibility in the main portions of the rods having the said contractible end formations.

While the connecting pieces forming parts of my toy construction blocks may be of a large variety of designs, I preferably provide the same either in the form of spheres equipped with a plurality of angularly disposed bores of uniform size (as in Fig. —4—), or in the shape of disks having a single axial bore and a plurality of other bores radially disposed about the axis of the disk and preferably having the axes of the consecutive radial bores spaced forty-five degrees apart, as shown in Figs. —1—, —5—

and —9—. The rods or longitudinal members of my construction blocks are preferably equipped at each end with slots extending longitudinally of the rods for some distance from the extreme tip, as shown in Figs. —6— and —8—. The said rods are of such size, at least at their ends, as to snugly fit the said bores in the connecting pieces; that is to say, while the spaces afforded by the slots between the component parts of the end portion of each rod will allow these component parts to be pressed toward each other or contracted to a peripheral size considerably smaller than one of the said bores, the resiliency of the said end portions will normally spring the same apart to a periphery at least equal to the bore of one of the sockets, thereby insuring a firm interfitting of the end of every rod and the socket in which it is inserted.

In assembling the rod and disk members, it will be evident that since the rod ends of the bores are of substantially equal size and since the contractibility of the slotted ends will compensate for any trifling irregularities in such equality of size, the rod ends may readily be slid into the bores of sockets if approached to the latter in axial alinement therewith. Thus, in Fig. 1, the rods 1 and 2 may freely be slid into adjacent sockets in the disk 3, after which the disk 4 may readily be slid upon the free end of the rod 1 and a third rod 5 may readily be slid into another socket in the disk 4. However, if it is then attempted to join the free ends of the rods 2 and 5 by means of a third disk 6, a difficulty is encountered for the reason that the tips of the said rods are spaced more closely together than the outer ends of the respective bores in which these tips are to be inserted. To provide for the simultaneous insertion of such angularly disposed tips into corresponding bores, it is necessary to spread the tips to provide the wider spacing when presented to the mouths of said bores. However, such a spreading apart of the adjacent ends necessarily changes the angles between the axes of the said rod ends, thereby making the said angle different from that between the adjacent bores in which the respective ends are to be inserted. Consequently, it is also necessary to provide means for enabling the said spaced ends to be inserted in their respective bores when somewhat out of axial alinement with the latter. In the construction blocks of my invention, I provide for this primarily by the said contractibility of the ends of the rods (which contractibility is greater at the extreme tips of the rods than at points farther from said tip) and to some extent also by the resiliency of the main portions of the rods. Thus, Fig. 5 shows a triangular formation similar to Fig. 1, but with the tips of the rods 5 and 2 partially slid into respective bores in the disk 6. It will be evident from the dotted lines (showing the corresponding position of the disk 6 while free) that the tips of the rods 2 and 5 have had to be spread apart to enable them to enter the respective sockets 7 and 8. This spreading is readily accomplished manually by exerting a separating pressure upon the said tips, which pressure is transmitted through the said rods respectively to their other ends 9 and 10, in each of which the said pressure effects a contraction of the slots, as shown in Fig. 5. Or, if the main portion of the rod is somewhat flexible, the said flexibility may be sufficient to flex the rod from its original position (as shown at 2′ in Fig. 5), so as to afford the desired movement of the tips without requiring a contraction of the other end 9. At the same time, the adjacent sides of the contractible end portions 11 and 12 will be spread apart somewhat while entering the respective sockets (as shown on a larger scale in Fig. 2), thereby compensating for the lack of alinement between the axes of the rods and the bores of the respective sockets while the latter are being entered by the said end portions. Consequently, it will require but little force to slide the disk 6 simultaneously over the respective end portions 11 and 12 of the rods 2 and 5, in doing which the resiliency of the said ends will gradually cause the latter to expand and to assume their normal dimensions as shown in Fig. 1. Then when the structure is to be disassembled, the corresponding yielding of the contractible end portions (possibly assisted by the flexibility of the rod members) will readily enable the disk 6 to be simultaneously detached from both the rods 2 and 5 with the use of but little force.

While the above described use of rods having contractible end portions will permit of combinations involving a large variety of angles between adjacent ends of rods, it will be evident that these angles will bear fixed relations to the lengths of the rods which may be adjoined in triangular formations by means of any three connecting members. I therefore preferably equip the connecting disks or connecting spheres 13 with radial bores separated by angles of 45° and multiples thereof, and preferably provide the rods in such lengths as to correspond progressively to the sides of adjacent isosceles right-angled triangles. In other words, I preferably provide rods of such lengths that when combined with the disks in triangular formations, the longer side of each triangle may form the shorter side of a similar adjacent triangle, as shown in Fig. 3. It will be evident that with the 45° spacing of adjacent bores in the disks as preferably used by me, this will mean effective rod lengths progressively increasing the ratio of one to

the square root of two, a suitable allowance being made in the actual rod lengths for the fact that the rods do not actually reach to the axes of the respective disks, so that the said proportion is only approximate. By making a suitable allowance for the distance between the axes of each disk and the inner end of the sockets therein (the disks being all of equal diameter) I can readily obtain the desired ratio, thus enabling me to secure the substantial alinement of consecutive rods 14 and 15 when connected as in Fig. 3, and a parallel positioning of rods 16, 17, 18, etc. However, I do not wish to be limited to the 45° spacing between the axes of consecutive bores or sockets in the connecting members, nor to the precise details as otherwise shown herein, as the latter might be varied in many ways without departing from the spirit of my invention. For example, instead of equipping the ends of the rods with slots extending diametrically through the same (as shown in Fig. 6), each rod end might be provided with a central bore 19 connecting a series of radial slots 20, as shown in Fig. 8.

I claim as my invention:—

1. A toy comprising a plurality of rods equipped with slotted ends of uniform diameter, and a plurality of connecting members equipped with relatively angularly disposed bores of equal diameters, the resiliency of the slotted ends of said bars maintaining said ends normally at a peripheral size at least equal to the diameter of the said bores; the slotting of the said ends enabling the tips thereof to be contracted to an effective diameter smaller than the diameter of the said bores, thereby enabling the end of each rod to be inserted in one of said bores when presented out of axial alinement therewith.

2. A toy comprising a plurality of rods equipped with diametrically contractible and resilient tips, and a plurality of connecting members equipped with relatively angularly disposed bores, the resiliency of each tip normally maintaining the same at a size at least equal to the diameter of each bore, the contractibility of each end portion of a rod enabling the tip of said rod to be reduced in size to permit the insertion of the said end portion in one of said bores when presented to the latter out of axial alinement therewith.

3. A toy comprising a plurality of rods equipped with diametrically contractible and resilient tips, and a plurality of connecting members equipped with relatively angularly disposed bores, the resiliency of each tip normally maintaining the same at a size at least equal to the diameter of each bore, the compressibility of each end portion of a rod enabling the tip of said rod to be reduced in size to permit the insertion of the said end portion in one of said bores when presented to the latter out of axial alinement therewith; each of said rods being made of resilient material, the resiliency thereof permitting a flexing of the main portions thereof and coöperating with the said contractibility of the end portions thereof to permit a plurality of rods to be simultaneously inserted in relatively angularly disposed bores in one of the said connecting members.

4. A toy comprising a plurality of rod members equipped with contractible ends normally of substantially equal diameter, and a plurality of connecting members equipped with relatively angularly disposed bores substantially equal in diameter to the said ends of the rod members; the lengths of said rods so proportioned as to permit the said rods and connecting members to be connected in triangular formation by inserting the adjacent ends of each pair of the rods in bores of a single connecting member; the relative lengths of the rods in adjacent triangular formations so proportioned as to enable the longer side of one triangle to form one of the short sides of a second triangle comprising the said rod and the connecting members at the ends thereof, together with a second pair of rods and another connecting member.

5. A toy comprising a plurality of rod members equipped with contractible ends normally of substantially equal diameter, and a plurality of connecting members equipped with bores disposed at angles of forty-five degrees and ninety degrees respectively, with each other; the diameter of each of said bores substantially equal to the said normal diameter of the ends of the rod members, the said rod members including lengths progressively increasing approximately in the ratio of one to the square root of two.

In testimony whereof I have signed my name in presence of two subscribing witnesses.

CHARLES H. PAJEAU.

Witnesses:
ALBERT SCHEIBLE,
G. M. NEVILLE.