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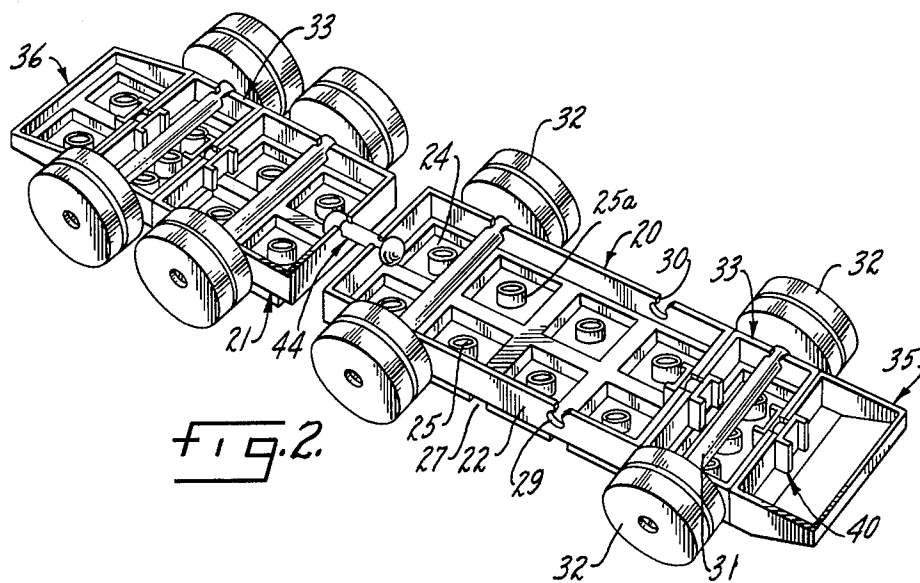
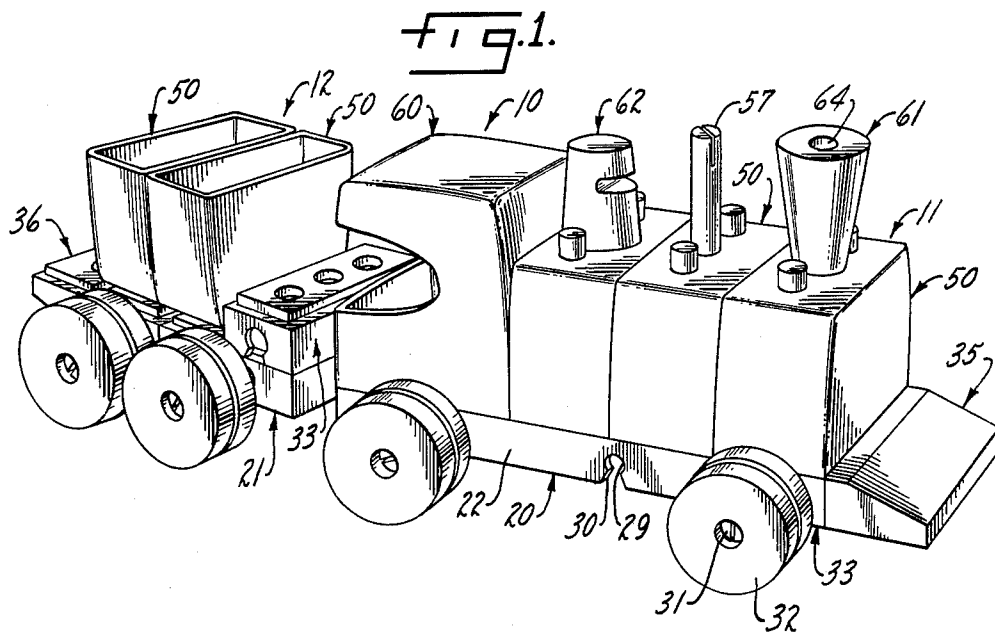
J. H. WRIGHT ETAL

3,224,137

TOY CONSTRUCTION BLOCK SET

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2 Sheets-Sheet 1



INVENTORS.
JOHN H. WRIGHT
CHARLES STOWE MYERS
BY
Wolfe, Hubbard, Yoit & Osann
ATTORNEYS.

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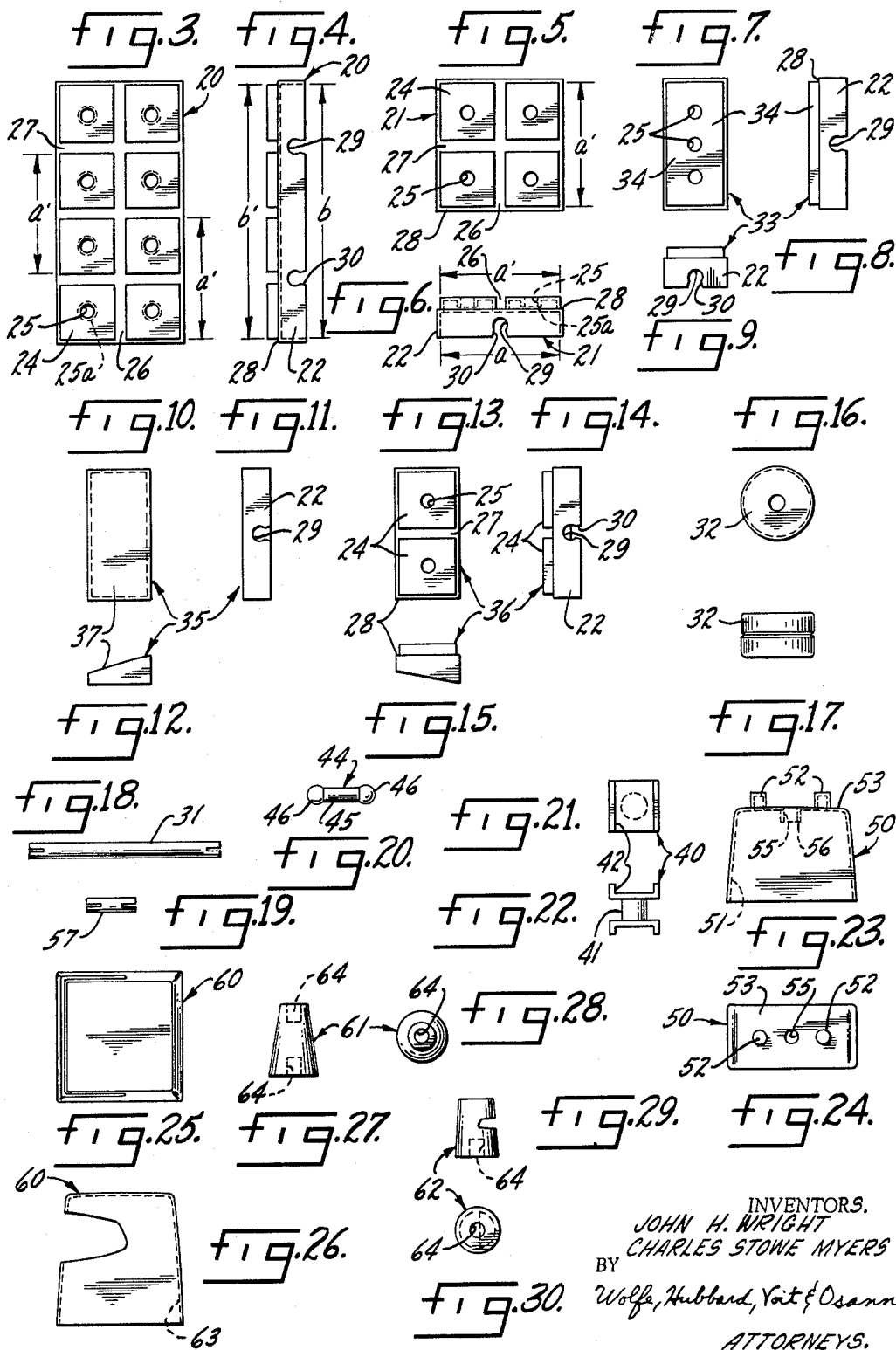
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2 Sheets-Sheet 2



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TOY CONSTRUCTION BLOCK SET

John H. Wright and Charles Stowe Myers, Evanston, Ill.,
assignors to A. G. Spalding & Bros. Inc., Chicopee,
Mass., a corporation of Delaware

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This invention relates to a toy construction set and has particular, but not exclusive, utility as applied to a construction set having elements adapted to be assembled into objects possessing forms suggested by mechanical devices such as vehicles and boats.

The primary aim of the present invention is to provide a construction set having a variety of elements that interfit with one another and which may be easily assembled in the form of a mechanical toy of the desired type and which may be subsequently disassociated and used over and over again.

A related object is to provide such a construction set having great versatility whereby a wide variety of mechanical toys or other objects may be assembled with the elements of the set. It is also an object to provide elements for such a set which are made of durable, long lasting material which is also partially resilient and deformable under pressure and therefore capable of withstanding the abuse that such construction sets can be expected to experience in normal use.

A further object is to provide a construction set of the above type having play value for both children and adults and also having educational value by stimulating the imagination to create and assemble mechanical toys or other objects of many types.

Other objects and advantages of the invention will become apparent upon reading the following detailed description and upon reference to the drawings in which:

FIGURE 1 is a perspective view of a mechanical toy in the form of a locomotive engine and tender constructed with elements of a construction set embodying this invention;

FIG. 2 is a perspective view of the underside of the mechanical toy shown in FIG. 1 and shows in more detail the connectors and hitches for coupling together the various elements of the set;

FIG. 3 is a plan view of a large platform construction block;

FIG. 4 is a side elevation of the block shown in FIG. 3;

FIG. 5 is a plan view of a half-platform construction block, similar to the block shown in FIG. 3;

FIG. 6 is an end elevation of the block shown in FIG. 5, and also illustrates the end elevation of the block shown in FIGS. 3 and 4;

FIG. 7 is a plan view of a small platform construction block;

FIGS. 8 and 9 are, respectively, side and end elevations of the block shown in FIG. 7;

FIG. 10 is a plan view of a tapered block;

FIGS. 11 and 12 are, respectively, side and end elevations of the block shown in FIG. 10;

FIG. 13 is a plan view of a tapered platform;

FIGS. 14 and 15 are, respectively, side and end elevations of the block shown in FIG. 13;

FIG. 16 is a side elevation of a wheel;

FIG. 17 is a plan view of the wheel shown in FIG. 16;

FIG. 18 is a side elevation of an axle;

FIG. 19 is a side elevation of a small connector pin;

FIG. 20 is a side elevation of a hitch;

FIG. 21 is an end elevation of a connector piece, enlarged to twice the size relative the other figures;

FIG. 22 is a plan view of the connector shown in FIG. 21;

FIG. 23 is a side elevation of a body block;

FIG. 24 is a plan view of the body block shown in FIG. 23;

FIG. 25 is a plan view of a cab member;

FIG. 26 is a side elevation of the cab member shown in FIG. 25;

FIG. 27 is a side elevation of a chimney;

FIG. 28 is a plan view of the chimney shown in FIG. 27;

FIG. 29 is a side elevation of a head piece; and

FIG. 30 is a plan view of the head piece shown in FIG. 29.

While the invention will be described in connection with a preferred embodiment, it will be understood that we do not intend to limit the invention to that embodiment. On the contrary, we intend to cover all alternatives, modifications and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

Turning now to the drawings, there is shown in FIGURE 1 a mechanical toy, generally indicated at 10, in the form of a locomotive engine 11 and tender 12 assembled from the elements of a construction set made according to the present invention. It will be understood that this exemplary toy 10 has been contrived merely to illustrate one type of toy which may be made from the present set. A great variety of other mechanical toys and objects, of course, may also be assembled with these elements. Referring to FIG. 2, which shows the underside of the exemplary toy 10, it will be apparent that the lower frame portion of the engine 11 and tender 12 are formed by coupling together individual construction blocks of the type shown in FIGS. 3-15. Also in keeping with the invention it will be seen that provision has been made for securing wheel and axle assemblies to certain of the construction elements so that wheel toys such as the illustrated engine and tender, or other vehicles may be easily assembled.

Referring more particularly to FIGS. 3-30, there is shown a variety of elements which make up the present construction set. It has been found that molded polyethylene provides a suitable material for all of the basic interfitting blocks shown in FIGS. 3-15 and the specialized elements illustrated in FIGS. 23-30, although it appears that other materials would also be suitable. The molded polyethylene material has been found to be deformable, yet resilient or "springy" enough, so that the elements will hold their shape and are capable of withstanding the abuse that such construction sets can be expected to experience through normal use. Moreover, the "springy" nature of the polyethylene enables the construction elements to be quickly and securely interfitted and yet allows the elements to be easily disassociated when the constructed toy is disassembled. This resiliency also contributes to the virtual snap action which is afforded certain of the interfitting parts as will be hereinafter more fully described. For the wheels, axles, and connecting pins, illustrated in FIGS. 16-19 wood has been found to be more satisfactory than the polyethylene material, although it should be understood that a plastic material might also be used for these elements.

The basic building elements for the construction set include a large platform block 20 and a half-platform or universal block 21 illustrated in FIGS. 3-6. It will be understood that the half-platform 21, as the name implies, is simply a block half as long as the large platform 20. The width of both blocks is the same and thus the end elevation of both blocks has been illustrated in FIG. 6. Moreover, the side elevation of the half-platform block 21, which is square, would also appear as in FIG. 6.

As shown in FIGS. 3-6, the large platform block 20 and half-platform block 21 are each formed with a hol-

low rectangular base portion 22 and a top portion which carries a plurality of individually raised lands 24. Centrally located in each of the raised lands 24 is an aperture 25 defined by an intumed lip 25a integrally formed with the surface of the raised land. The raised lands 24 on the large platform 20 are located on the top portion so as to define a centrally disposed, longitudinal groove or slot 26 and a plurality of transverse grooves or slots 27 bisecting the platform, respectively, at the midpoint and the upper and lower halves. The half-platform 21, of course, has only a single transverse groove 27 which is normal to and bisects the longitudinal groove 26. The width of each groove is chosen to accommodate the thickness of two walls of the blocks' base portion 22. In addition, the lands 24 are located slightly inwardly from the rectangular base 22 so as to define a narrow peripheral shoulder 28. The shoulder 28 thus serves as a stop against which the lower edge of the rectangular box portion 22 of a similar large platform 20 or half-platform 21 may rest.

In order that the blocks 21 and 20 may be assembled in securely interfitting stacked relationship, the inside dimensions of the box portion 22 of the blocks are slightly smaller than the corresponding external dimension across the raised lands 24. Accordingly, when one platform is stacked upon another platform a slight stretch or force fit is provided between the inside walls of the rectangular box portion 22 and the external walls of the mating raised lands of the associated platform. Thus, the inside transverse dimension of the blocks 20, 21, indicated at *a* in FIG. 6 is slightly smaller than the external dimension *a'* across two of the lands 24. Similarly, the longitudinal inside dimension of the block 20, indicated at *b* in FIG. 4, is somewhat smaller than the external longitudinal dimension *b'* across four of the raised lands 24.

It will also be seen by reference to FIGS. 3 and 5 that the longitudinal dimension across any two adjacent lands 24 of the blocks 20, 21 is also *a'*. This permits, for example, the universal block 21 to be easily and securely mounted at any of three locations on the large platform block 20. Thus, the block 21 can be mounted on the upper half, the middle portion, or the lower half of the block 20. Similarly, one large platform block 20 can be mounted transversely across another large platform block in any of the foregoing positions. In the latter instance, of course, the upper larger platform 20 may be located so as to extend laterally from either side of the under block 20 or alternatively it can be located at any intermediate position.

The blocks 20, 21 can also be stacked in "staggered" relation with one block over the joint between the two blocks below it. For example, two of the half-platform blocks 21 can be placed end to end and a third half-platform block may be mounted over four of the raised lands 24, two of which are on each of the lower blocks 21. The same holds true for the large platform blocks 20. One large block 20, of course, can cover two half-platform blocks 21 placed end to end, and conversely, two half-platform blocks can be mounted on a single large platform block. Various other arrangements are also possible since the blocks 20, 21 may be assembled with one or more of them extending either axially or laterally from above or below an associated block. Spaces between adjacent blocks may also be provided and covered with a large platform block in order to build bridges, tunnels or the like.

In further accordance with the present invention, the platform blocks 20 and 21 are each provided with a plurality of axle receiving and retaining openings 29 which open outwardly from the base portions 22 of the blocks. In the preferred construction, each of the blocks 20, 21 includes a pair of recesses 29 which are located in the walls of the lower box-like portion 22 directly below the longitudinal slot 26 on the upper surface 23 of the block. Since the half-platform block is adapted for universal

orientation, it will be understood that another pair of the recesses 29 are located in the lower portion 22 directly beneath the transverse groove 27. The large platform block 20, which generally conforms to a pair of small platforms 21 placed end to end, includes two pairs of recesses 29 located on the transverse walls of the lower portion 22, respectively, located below the transverse grooves 27 which bisect the upper and lower halves of the block.

The recesses 29 are preferably generally circular in shape and have a flared entrance 30 which permits easy access thereto. The diameter of each of the recesses is chosen in order to freely journal an axle rod 31 of the type shown in FIG. 18. It will also be understood that the flared entrance 30 is slightly restricted adjacent the recess 29, at which point the width of the entrance is slightly less than the diameter of the axle 31. Therefore, due to the resiliency of the preferred polyethylene blocks 20, 21, the axle 31 may be virtually snapped through the entrance 30 and into the recess 29 where it is freely journaled, yet securely retained due to the restricted opening. The wheels 32, shown in FIGS. 16 and 17 may be attached to the axle rods 31 to complete the wheel and axle assemblies for the toy 10 shown in FIGS. 1 and 2.

Another basic element of the present construction set is a small platform block 33 as shown in FIGS. 7-9. The small platform block 33, of course, has certain basic similarities to the previously described platform blocks 20, 21. It will be seen, for example, that the small block 33 also includes a hollow rectangular base portion 22 in which both transverse and axially aligned recesses 29 are located. The small block, however, has but a single raised land portion 34 which terminates slightly inwardly from the rectangular base 22 to define the narrow peripheral shoulder 28. Moreover, in the small block 33 three aligned apertures 25 are disposed longitudinally of the block with the center apertures 25 replacing the transverse grooves 27 in the blocks 20, 21. Accordingly, it will be appreciated that in the small block 32 one pair of recesses 29 are located in longitudinal alignment with the three apertures 25 (FIG. 9), and the other pair of recesses 29 are in transverse alignment with the center apertures 25 (FIG. 8).

To permit an even greater range of shapes and objects to be constructed from the present set, there are provided tapered blocks 35 and tapered platforms 36 as shown in FIGS. 10-12 and 13-15, respectively. The tapered block 35 also includes a generally hollow rectangular base portion 22 and a substantially flat sloping top 37. The taper platform, however, has only a single recess 29 formed centrally in one wall of the base 22 (FIG. 10). The tapered platform, as the name implies, has basic similarities to both the tapered block 35 and the platform blocks 20, 21. To this end, the tapered platform has a hollow rectangular base 22 which defines in one wall a single recess 29 disposed below the single transverse groove 27 bisecting two raised land portions 24 (FIG. 14). Each raised land portion 24 is set in inwardly from the base 22 so as to define a peripheral shoulder 28 and each land defines a centrally located aperture 25. It will, however, be noted that the tapered platform is a reverse slope from that of the tapered block (see FIGS. 12 and 15). In both the tapered block 35 and the tapered platform 36, the one wall which defines the recess 29 is dimensionally the same as the similar wall in the lower portion 22 of all of the platform blocks 20, 21 and 33 (see FIGS. 6 and 8).

All of the previously mentioned construction blocks and platforms can be joined or assembled in end-to-end relation (and side-to-side in the case of platforms 20, 21 and 33) as well as the stacked type mounting mentioned above. Thus, as shown in FIG. 2, the platforms and blocks 20, 21, 33, 35 and 36 are assembled and securely held in end-to-end relationship by means of connectors 40 which are inserted into the aligned and co-

operating recesses 29 of the adjacent blocks. The connectors 40 are preferably generally H-shaped with a substantially cylindrical body 41 which is dimensioned to snap into the recesses 29 and which interconnects a pair of opposed, substantially channel shaped end pieces 42 (FIGS. 21 and 22). Desirably, the connectors are also formed of the same resilient polyethylene material which is used in the other construction elements. Thus, the outwardly extending flanges of the channelled ends 42 can be pinched together slightly so that the connector can be virtually snapped into a pair of mating recesses 29. When the channel ends 42 are released, the connector 40 springs back to its original H-shaped configuration firmly sandwiching the walls of the adjacent blocks.

Alternatively, the blocks and platforms may be loosely coupled together by means of hitch connectors 44 (see FIGS. 2 and 20). The hitch connectors 44 may also be formed of the preferred polyethylene material and are generally shaped like a dumbbell with a cylindrical body portion 45 and enlarged spherical ends 46. The spherical ends are substantially larger than the diameter of the recesses 29 which thereby prevents axial withdrawal of the hitch from the recess. It will also be understood that the hitch 44 snaps into the recesses 29 in the same manner as the axles described above. The hitch 44 thus provides for limited universal coupling between the various blocks and platforms and may be used to interconnect individual wheeled toys such as the engine 11 and tender 12 shown in FIGS. 1 and 2.

To permit the assembly of closed body structures or open bins and hoppers, the present construction set also includes body elements 50 (see FIGS. 23 and 24). The body blocks 50 are formed with a generally rectangular, hollow box-like configuration with one open end 51. As will be apparent by reference to FIG. 1, the body blocks 50 may be mounted on the platform blocks 20, 21, 33 in either a closed upright position as on the engine 11 or in an inverted open position to form the hopper of the tender 12.

In order that the body blocks 50 may be securely mounted on the platform blocks in the closed upright position, the internal dimensions of the open end 51 of the body blocks are somewhat less than the external dimensions across two adjacent lands 24 of the platform blocks 20, 21. Thus, a force fit is also provided in mounting the open end of the body blocks over the lands 24. This also permits the body blocks to be mounted on the platform blocks in either a transverse or a longitudinal orientation.

For mounting the body blocks 50 in an open inverted manner, each body block includes a pair of lugs or nipples 52 which project from the closed end 53 of the block. The nipples 52, which are each centrally located across the width of the body block 50, have a diameter slightly larger than the diameter of the apertures 25 located in the platform blocks. The center-to-center spacing of the nipples also corresponds with the center-to-center spacing of any two adjacent apertures 25 located in the raised lands 24. It will be apparent, therefore, that the body blocks 50 may be mounted in an open inverted manner on the platform blocks simply by inserting the nipples 52 into the apertures 25 of the platform blocks where they are held in firm engagement by the internal lips 25a of the slightly smaller apertures 25.

To further facilitate the construction possibilities of the present set, the body blocks 50 each define a single centrally disposed aperture 55 defined by intumed lips 56 similar to the intumed lips 25a in the platform blocks. The aperture 55 is dimensioned to snugly receive a short connector pin 57 shown in FIG. 19. The short pin 57 can in turn, be used to attach additional components to the body blocks 50 as hereinafter described. Moreover, the central aperture 55 in the body blocks permits the insertion of longer pins or axle rods 31 in order to build special toys such as derricks, cranes and the like.

To add distinctiveness and additional reality to the toys which may be constructed from the present set, several additional specialized elements are included with each set. These specialized elements include a hollow cab member 60, shown in FIGS. 25 and 26, a reversible chimney 61 shown in FIGS. 27 and 28 and a head member 62 shown in FIGS. 29 and 30. These elements are also each shown assembled with other elements of the set in the illustrative toy 10 shown in FIG. 1. It will also be understood that the cab member has one open end 63 dimensioned so as to snugly fit over a square defined by four of the raised lands 24 on the platform blocks. The chimney 61 has a pair of opposed and axially aligned dowel receiving recesses 64 which enable the chimney to be reversibly mounted either upon the nipples 52 or the connecting pins 57. The head piece 62 is formed with a single dowel receiving recess 64 for the same purpose.

It will be apparent from the above description that the various elements of the present construction set may be assembled to form a wide variety of mechanical toys and other objects which differ significantly in form and appeal from the engine 11 and tender 12 of the illustrative toy 10. Among the other possibilities which may be constructed with the present construction set are: cars and trucks of various sizes and shapes; boats, barges and tugs; and a wide range of additional railroad cars. It will also be appreciated that the present set has great play value for both children and adults, and the construction of various mechanical toys and other objects serves to stimulate the imagination and creative ability of all who have an opportunity to build with it.

Finally, the versatility and durability of the individual elements of the construction set should not be overlooked. All of the major construction elements are preferably formed of a durable and resilient polyethylene plastic material which is "springy" enough to allow the parts to securely interfit with one another and yet to permit quick and easy disassembly of the components so that they may be used over and over again in the construction of other toys. In addition, the elements readily withstand the abuse that such sets can be normally expected to experience.

We claim as our invention:

1. In a toy construction set, the combination including a plurality of construction blocks having the same width but having various lengths and profiles, said blocks having hollow base portions with at least one wall of said base portions defining a generally keyhole-shaped recess having an outwardly flared opening thereinto, a connector means for securing said blocks together in wall-to-wall relationship, said connector means having a generally H-shaped configuration with a cylindrical center portion dimensioned for insertion through said flared opening and into said recess, and said connector means having generally channel shaped end pieces, said connector means being formed of a resilient material whereby said means is deformable under pressure to allow said connector means to be inserted into two of said recesses and when said pressure is released said end pieces tightly grip two of said walls therebetween.

2. The combination defined in claim 1 wherein said one wall of said base portions of each of said construction blocks is formed having identical dimensions including the location of said keyhole-shaped recess for receiving said connector.

3. The combination defined in claim 2 wherein said base portions of said construction blocks are generally rectangular and said one wall of said base portions of each of said construction blocks has the same width with said keyhole being centrally located therein for receiving said connector.

4. The combination defined in claim 3 wherein at least one of said generally keyhole-shaped recesses for receiving one of said connectors is formed in each wall of said

rectangular base portion of one or more of said construction blocks.

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RICHARD C. PINKHAM, *Primary Examiner.*