April 9, 1935. J. HIRSHFELD 1,997,060

CONVEYER

Filed Jan. 28, 1931 2 Sheets-Sheet 1

FIG. 1

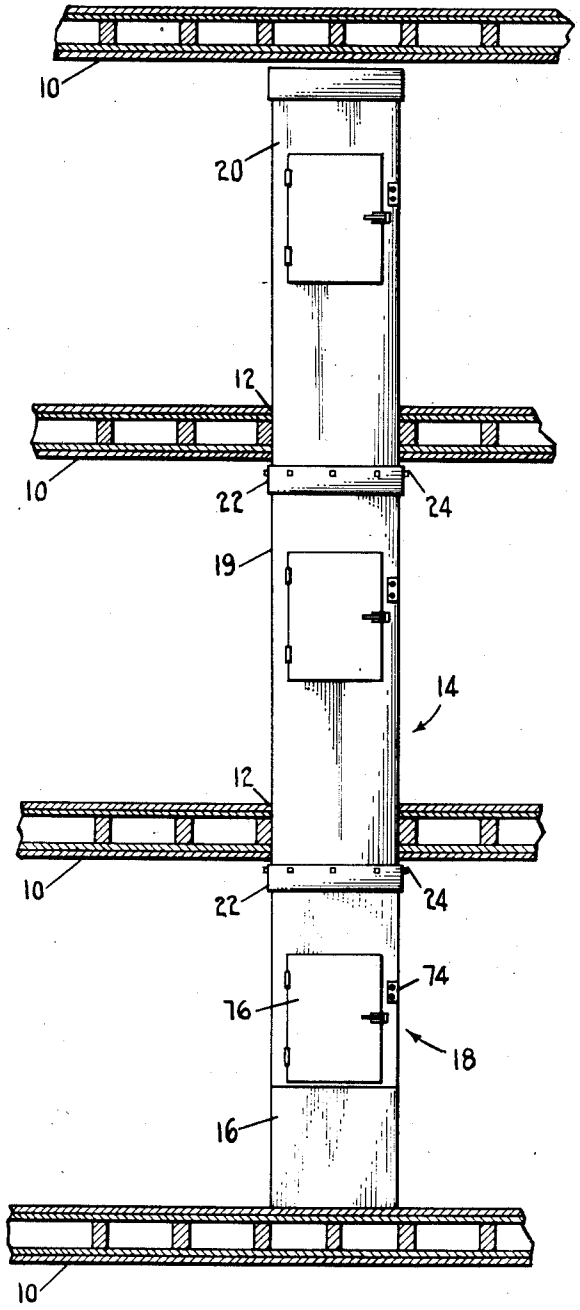


FIG. 4

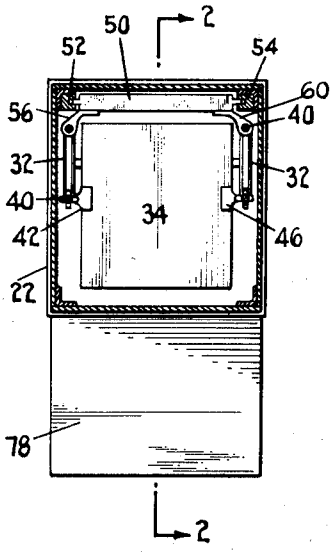
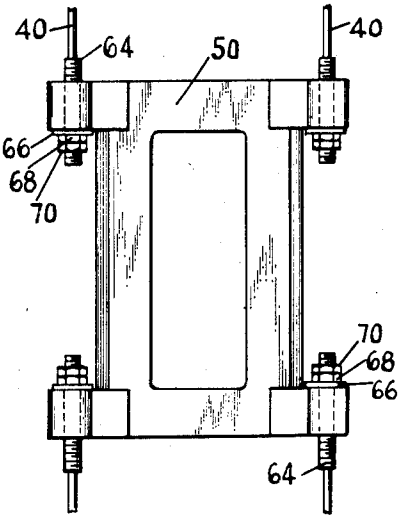


FIG. 5



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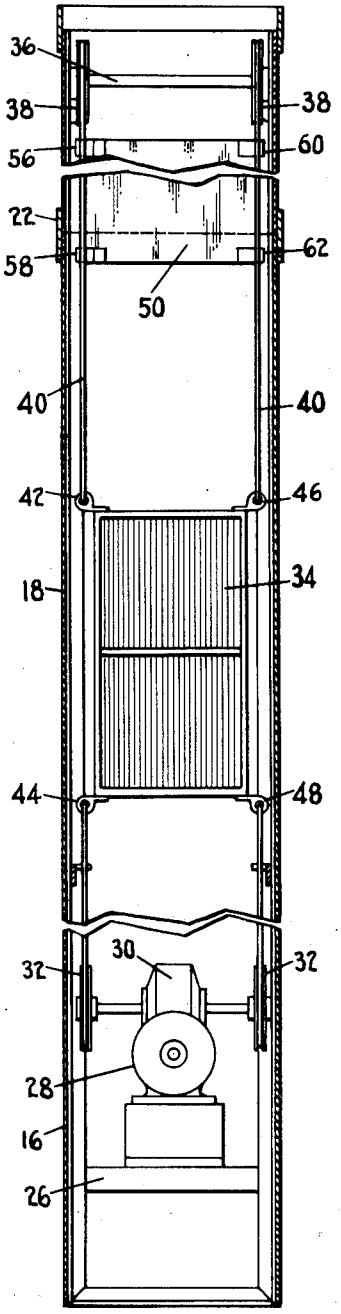


FIG. 3

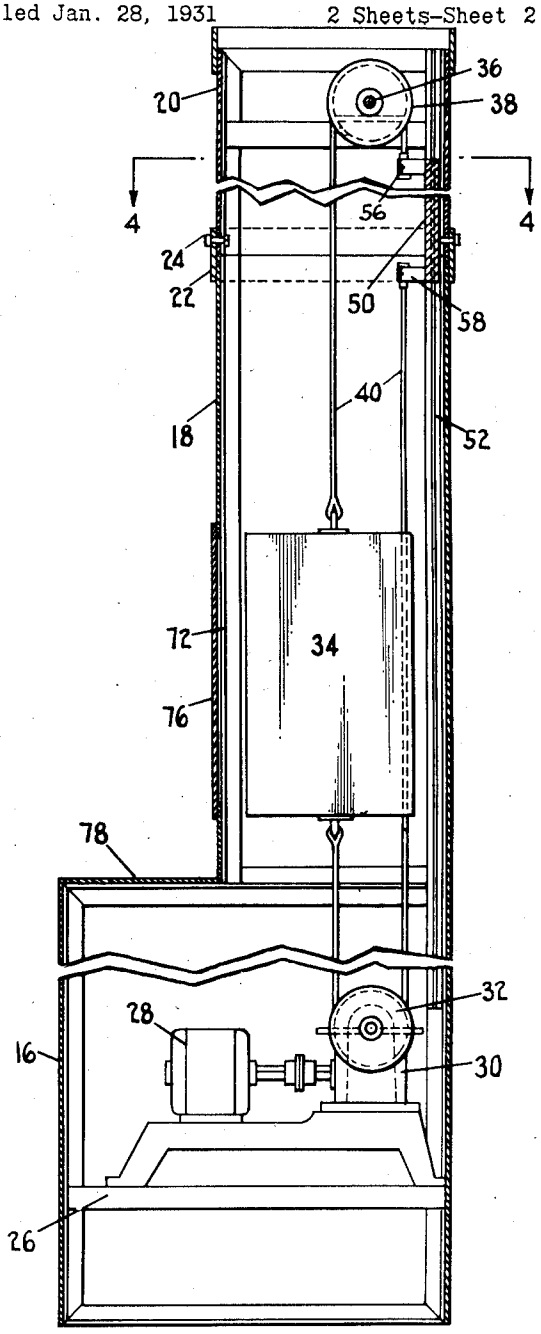


FIG. 2

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UNITED STATES PATENT OFFICE

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CONVEYER

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Application January 28, 1931, Serial No. 511,688

8 Claims. (Cl. 187—3)

This invention relates to dumbwaiter or elevator construction.

The invention has specific reference to the installation of dumbwaiter or elevator construction in buildings which have previously been constructed, or, in special instances, to the incorporation of such elevator construction into a building, then in the course of construction. It has, for its purpose, the provision of a number of sections which lend themselves easily to transportation, and to such other purposes for which units, which are easily handled, are adapted.

A purpose of the invention lies in the provision of a plurality of sections which, when assembled, will define an elevator or carrier shaft such as that used in dumbwaiter operation, which shaft, while entirely distinct from the building construction, will, in fact, form an integral part of such construction. The construction is such that, where the construction of a building has been completed, still, by making a predetermined number of cuts through one or more superposed floors of such building, it is possible to assemble within such building, with despatch, a complete elevator unit, which then becomes an integral part of the building structure. One of the sections is intended to have incorporated thereinto substantially all the operating elements of the dumbwaiter or elevator. Power means for the apparatus is intended to be assembled within one of the members, and in the specific apparatus herein set forth, the power means is located within the section which will define the base of the elevator shaft. This section is of greater lateral extent than the section or sections superimposed thereon so that its top will dispose a desk-like structure for use, as where the elevator or carrier is installed in libraries or the like, for supporting the articles, such as books, which are to be loaded on the elevator and transported between the several floors of the library.

It is an object of the invention to define, by one of the sections, and preferably, by such base section, the distance at which the door openings for the shaft will be positioned above a predetermined base line, such as the floor relatively to which the elevator is assembled.

It is an object of the invention to assemble, within the sections, individual portions of the dumbwaiter mechanism, so that, in transporting these sections from their point of manufacture, or some similar point, to their point of final assembly, these parts may be fixedly retained relatively to their respective sections, so that, when the sections are assembled finally, in the desired relationship, it will be necessary only to remove a few securing means, such as blocks, or the like, to permit the apparatus to operate and function in the manner desired.

Other objects of this invention will be hereinafter set forth, or will be apparent from the description and the drawings, in which is illustrated embodiment of apparatus for carrying out the invention.

The invention, however, is not intended to be restricted to the particular construction and arrangement of parts, nor to the particular applications of such constructions, herein shown and described, nor to the specific method of assembly, nor to the various steps or details thereof, as the same may be modified in various particulars, or be applied in many varied relations, without departing from the spirit and scope of the invention, a practical embodiment of which has been herein illustrated and described, without attempting to show all the various forms and modifications in which the invention might be practised.

For the attainment of these objects and of such other objects as may hereinafter appear or be pointed out, I have illustrated an embodiment of my invention in the drawings wherein:—

Figure 1 is an elevational view showing a building construction broken away and the invention installed therein, and a shaft defining means embodying my invention installed therein;

Figure 2 is a transverse vertical section taken on line 2—2 of Figure 4 showing parts taken in elevation;

Figure 3 is a section similar to that of Figure 2 taken at right angles thereto;

Figure 4 is a horizontal section taken on lines 4—4 of Figure 2; and

Figure 5 is an elevation of a detail.

On the drawings, the invention is seen applied, in use, to a building construction, including a number of superposed floors 10, through openings 12 in a number of which the elevator, or dumbwaiter shaft defining means 14 extends. In the illustration, the shaft defining means consists of a number of sections 16, 18, 19 and 20, section 16 constituting a base for the assembled dumbwaiter apparatus.

The sections may be made of any suitable material which would result in the production of substantially light-weight members, capable of transportation easily from point to point, when the shaft defining means is not in assembled relation. Preferably, the sections are of sheet metal, the corners being braced by angle iron, which may also serve to retain the side walls of the sec-

tions in the desired form. These angles may also provide guides for the elevator carriage and the counter-weight therefor, if so desired. The sections, when assembled, are held in relation to each other by any well known means, preferably, in this instance, by means of straps, or similar connecting bonds 22. In securing superposed sections to each other, the straps are secured between such sections by means of any desired devices, such as bolts 24. The straps and the bolts are made part of the apparatus in such manner that these sections may be associated, and the shaft defining means broken up, at will, in order that it be transported from one set-up position to another, when so desired.

Section 16, preferably, is a box-like structure, within which is provided a base support 26, upon which is assembled a motor 28, reduction gearing or similar power transmitting mechanism 30 and elevator pulleys 32. The motor and the mechanism for transmitting power to the pulleys 32 may be of any well known construction, their purpose being merely to supply the necessary power for moving the dumbwaiter or elevator carriage up and down through the shaft defining means 14.

One of the sections 20, and in this case, the extreme upper section, has assembled therein and extending transversely of the upper end of the section, a shaft 36, upon which are carried a pair of pulleys 38. These pulleys, when the sections are assembled, will be disposed immediately above, and in alignment with, pulleys 32. Cables 40 pass between pulleys 32 and 38. It is to be understood that motor 28 and its associated mechanism may be assembled in section 20, and the pulleys 38 be driven directly from the motor. However, for the purpose of stability in transportation, and also to divide the burden among the several sections, it is preferred that the motor be mounted as herein illustrated.

Cables 40 are engaged with carriage 34 at opposite sides thereof, as indicated at 42, 44, 46 and 48. A counter-weight 50 is assembled to slide within guides 52 and 54, at the rear of the shaft defining means 14, the guides in the separate sections being so formed and related that, when the sections are in assembled relation, they will lead one into the other. Cables 40 also connect with the counter-weight 50 at points 56, 58, 60 and 62, in substantially the same manner as their connections with the carriage 34. Since the weight of the cables tends to act against positive frictional contact of the cable with the surfaces of the elevator pulleys 32, the weight of the cables will tend to separate the cables from the bottom surfaces of the pulleys and operate against efficient traction. In order to counteract such effect, the connections 56, 58, 60 and 62 are made by means of mechanism corresponding to a turnbuckle, that is, the cable is terminated within a sleeve 64, as appears more fully in Figure 5. By means of washer 66, the nut 68, and the lock-nut 70, the cable may be drawn toward, or released for movement away from, the counterweight, and locked in that relation. This adjusting means provided apparatus for easily, quickly and accurately placing the cables under a tension such as may predeterminedly be found necessary to insure tractive effort at pulleys 32.

In the construction shown in the drawings, each of the sections 18, 19 and 20 is shown to have a door opening 72, so that carriage 34 is made accessible at each one of the floors 10; also, switches 74 are provided at each of the floors, by means of which the movement of the elevator from floor to floor may be governed in any desired manner. By means of switches 74 and the doors 76 at the openings 72, the carriage 34 may be made operative to effect the functions to which dumbwaiters or elevators of this character are ordinarily directed.

Section 16, in a preferred construction, may take the form of an article of furniture, such as a desk, or the like, so that the platform 78, thereby provided, may be used, not only for the storage of materials to be carried upon, or delivered from, carriage 34, but also for any such purposes to which an article of furniture of that specific character generally is applied. The section, in addition, functions to define the distance above its respective floor 10 at which the door opening 72 of the section 18 and also, in a preferred construction, the door openings of the other sections with respect to their related floors will be positioned. That is, section 16 may be made of varying heights, in accordance with the particular relation in which the shaft defining means is to be assembled, and, also, the purposes to which the elevator shaft is to be applied, and sections 16 of different heights may be utilized for defining the relative positions of the doors with respect to their floors. For instance, in some cases, it may be desirable to use the elevator to deliver articles approximately at floor level, or at some particular height above floor level. Section 16, in such case, would be proportioned so that the door opening 72 of the section 18 would have the desired relation to its particular floor. It might be necessary, in some cases, to make the section 16 extend substantially an entire floor, to accomplish the desired end. In other cases, the section 16 would extend merely the distance, above the floor, of the height of a desk, or some similar article of furniture, the other sections being then superposed upon it.

It is to be understood that, while it is preferred to have sections similar in function to sections 16 and 20, insofar as the arrangement of the elevator operating mechanism is concerned, it is, however, a matter of construction as to how many sections 19 are necessary to interpose between these two sections in the arrangement of the elevator assembly. As many sections 19 may be used as would be necessary to extend the shaft defining means through the required number of floors and to position at each of such floors as may require it, a door opening 72, for permitting access to the carriage within the shaft.

In the knocked-down condition, it can be understood that the carriage and the counterweight may be blocked in position in one of the sections, or in separate sections, so that they will not move through the sections. Then, when the sections have been assembled in a predetermined relationship, and the cables have been connected to the counterweight and the carriage, and have been passed around the respective pulleys, the blocks may be knocked out and the elevator or carriage will be prepared for immediate operation.

In the assembly of the shaft defining means within the buildings, cuts are made in the superposed floors 10 to provide the openings 12. The section 16 is positioned immediately below the openings and in alignment therewith. Section 19 may then be lowered from the upper floor 10, through the opening 12 therein, until it is positioned upon the section 16 to which it is secured by the devices 22 and 24. Other sections

19 from other floors are assembled thereafter, in like manner, the entire assemblage being finally capped by section 20. Cables 40 are applied, the blocks discarded, and the apparatus is ready for operation.

Many changes could be effected in the particular apparatus designed, and in the methods of operation set forth, and in the specific details thereof, without substantially departing from the invention hereof, which is intended to be defined in the accompanying claims, the specific description hereinabove being set forth merely to illustrate operative embodiments for carrying out the spirit of the invention.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is—

1. In a self-contained and self-sustaining elevator unit adapted for installation in buildings in a state of completion; a base section comprising a lower horizontally enlarged portion for containing the motive power and an upper portion of restricted dimensions forming a shaft-way, and provided with an opening by which access may be had to the shaft, the vertical dimensions of said base section making it adaptable for positioning between two adjacent, superposed floors of a building; a shaft-way composed of at least one section, the maximum dimensions of each shaft-way section being determined by the space between adjacent superposed floors so that it may be lowered into position on the section next below it, by being lowered into place, and without disturbing the building construction in any other way than by provision of an opening in the floors thereof sufficient for the accommodation of the shaft-way; and said maximum dimensions of said sections, including the base section, being further limited by the requirement of capability of transportation in assembled form from the factory to the place of installation; said shaft-way sections being adapted, when assembled, to form a shaft-way of substantially uniform cross-section forming a continuation of the restricted portion of the base section; openings provided in certain of said sections for providing access to the interior of said shaft-way; a top section adapted to seat on said shaft-way and comprising guiding means for the moving parts; and moving parts, such as a carriage, a counter-poise and cables adapted for installation within said shaft-way.

2. In a self-contained and self-sustaining elevator unit adapted for installation in buildings in a state of completion, a base section comprising a portion for containing the motive power and an upper portion forming a shaft-way, and provided with an opening by which access may be had to the shaft, the vertical dimensions of said base section making it adaptable for positioning between two adjacent, superposed floors of a building; a shaft-way composed of at least one section, the maximum vertical dimension of each section being determined by the space between adjacent superposed floors so that it may be lowered into position on the section next below it, by being lowered into place, and without disturbing the building construction in any other way than by provision of an opening in the floors thereof sufficient for the accommodation of the shaft-way, and the maximum dimensions of said sections, including the base section, being further limited by the requirements of capability of transportation in assembled form from the factory to the place of installation; said shaft-way sections being adapted, when assembled, to form a shaft-way of uniform characteristics forming a continuation of the restricted portion of the base section; openings provided in certain of said sections for providing access to the interior of said shaft-way; a top section adapted to seat on said shaft-way and comprising guiding means for the moving parts; and moving parts, adapted for installation within said shaft-way.

3. In a self-contained and self-sustaining elevator unit adapted for installation in buildings in a state of completion, a base section having the motive power installed in a portion thereof, and an upper portion forming a shaft-way, the vertical dimensions of said base section making it adaptable for positioning between two adjacent, superposed floors of a building; a shaft-way composed of at least one section, the maximum vertical dimension of each section being determined by the space between adjacent superposed floors so that it may be lowered into position on the section next below it, by being lowered into place, and without disturbing the building construction in any other way than by provision of an opening in the floors thereof sufficient for the accommodation of the shaft-way, and the maximum vertical dimensions of said sections, including the base section, being further limited by the requirements of capability of transportation in assembled form from the factory to the place of installation; said shaft-way sections being adapted, when assembled, to form a shaft-way of uniform cross-section; a top section adapted to seat on said shaft-way and comprising guiding means for the moving parts; and moving parts, adapted for installation within said shaft-way.

4. The method of installing in a building a self-sustaining dumbwaiter structure, or the like, which comprises the step or steps of providing said dumbwaiter structure in sections of a size convenient for shipment, each section being complete and ready to function as part of the structure when assembled in relation to the other sections and to the structure, and the lowest and uppermost sections containing in assembled relation the moving parts, except the carriage; providing vertically aligned openings in the floors of the building suitable for the passage therethrough of sections of the dumbwaiter shaft, installing the base section in place in vertical alignment with said openings, lowering the next shaft section through the opening in the floor immediately above the base section and superposing and fastening it in place on the base section, inserting the carriage and proceeding similarly with the other shaft sections until the shaft is completed, and then operatively interconnecting the moving parts.

5. The method of providing a building with a self-sustaining dumbwaiter structure, or the like, which comprises the step or steps of manufacturing said dumbwaiter shaftway structure, at a factory remote from the building, in sections of a size convenient for shipment, each section being complete and ready to function as part of the structure when assembled in relation to the other sections and to the structure, and certain of the sections containing in assembled relation the moving parts, providing vertically aligned openings in the floors of the building suitable for the passage therethrough of sections of the dumbwaiter shaft, installing the base section in place in vertical alignment with said

openings, lowering each shaft section into superposition on its subjacent section through the openings in the floors, and fastening it in place on said subjacent section.

6. The method of installing in a building a self-sustaining dumbwaiter structure, or the like, which comprises the step or steps of providing said dumbwaiter structure in sections of a size convenient for shipment, each section being complete and ready to function as part of the structure when assembled in relation to the other sections of the structure and to the building, transporting said sections to the place of installation, providing vertically aligned openings in the floors of the building suitable for the passage therethrough of sections of the dumbwaiter structure, installing the base section in its place in vertical alignment with said openings, lowering the next shaft section through the opening in the floor immediately above the base section and superposing and fastening it in place on the base section, and proceeding similarly, with the other shaft sections until the structure is completed, and then operatively interconnecting the moving parts.

7. The method of installing in a building a self-sustaining dumbwaiter structure or the like, which comprises the step or steps of manufacturing said dumbwaiter structure in sections of a size convenient for shipment and bearing a predetermined relation to the spaces between the floors of the building, each section being complete and ready to function as part of the structure when assembled in relation to the other sections and to the structure, and the lowest and uppermost sections containing in assembled relation the moving parts, except the carriage, providing vertically aligned openings in the floors of the building suitable for the passage therethrough of sections of the dumbwaiter shaft, installing the base section in place in vertical alignment with said openings, lowering the next shaft section through the opening in the floor immediately above the base section and superposing and fastening it in place on the base section, inserting the carriage and proceeding similarly, with the other shaft sections until the shaft is completed, and then operatively interconnecting the moving parts, including the carriage.

8. The method of installing in a building a self-sustaining dumbwaiter structure, or the like, which comprises the step or steps of providing said dumbwaiter structure in sections of a size convenient for shipment and bearing a predetermined relation to the spaces between the floors of the building whereby they are adapted for installation therein, each section being complete and ready to function as part of the structure when assembled in relation to the other sections and to the structure, and certain of the sections containing in assembled relation the moving parts, providing vertically aligned openings in the floors of the building suitable for the passage therethrough of sections of the dumbwaiter shaft, installing the base section in its place in vertical alignment with said openings, lowering the next shaft section through the opening in the floor immediately above the base section and superposing and fastening it in place on the base section, and proceeding similarly, with the other shaft sections until the shaft is completed, and then operatively interconnecting the moving parts.

JEROME HIRSHFELD.