

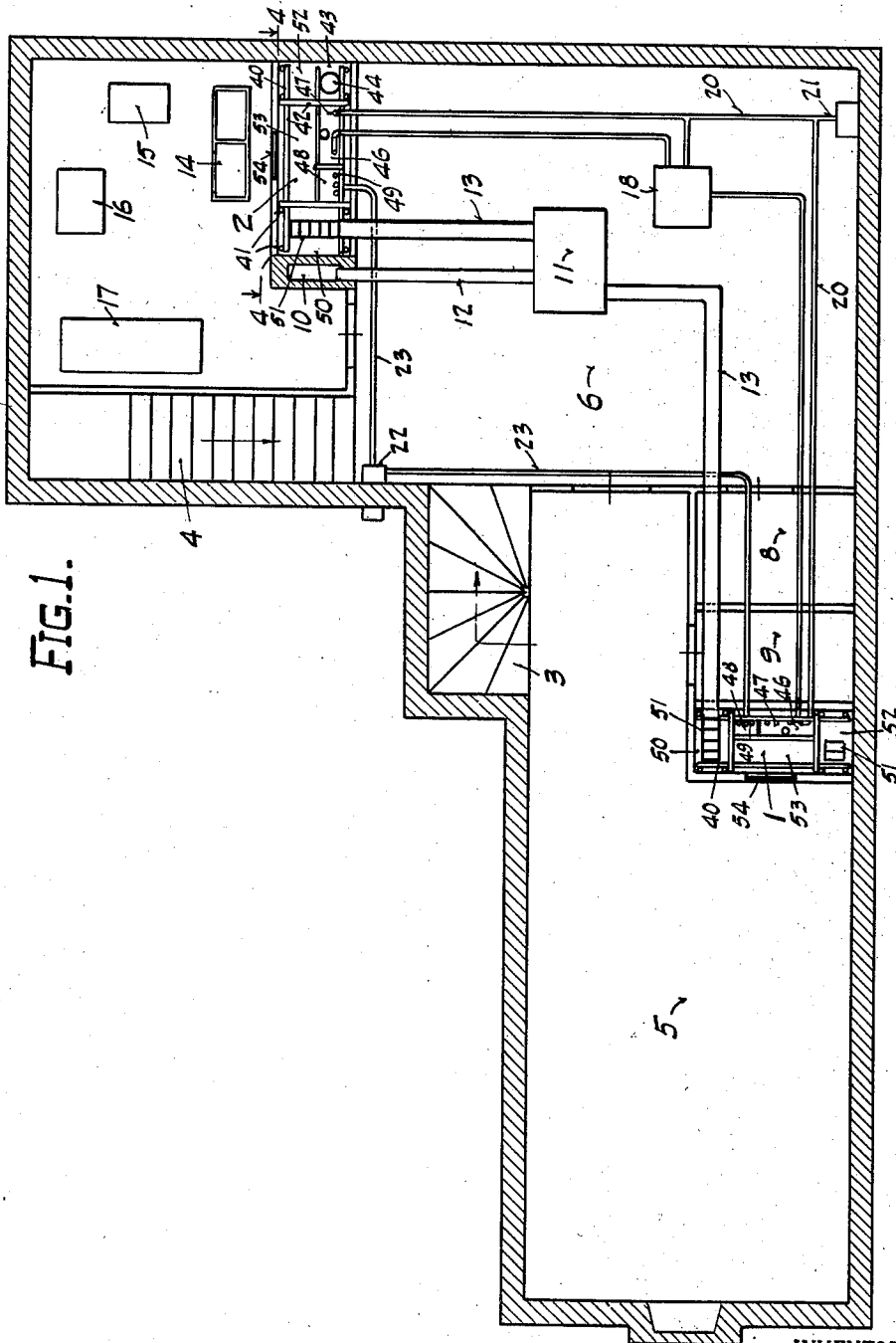
May 29, 1951

G. L. SCHEFFER  
HOUSE CONSTRUCTION

2,555,157

Filed Dec. 7, 1944

4 Sheets-Sheet 1



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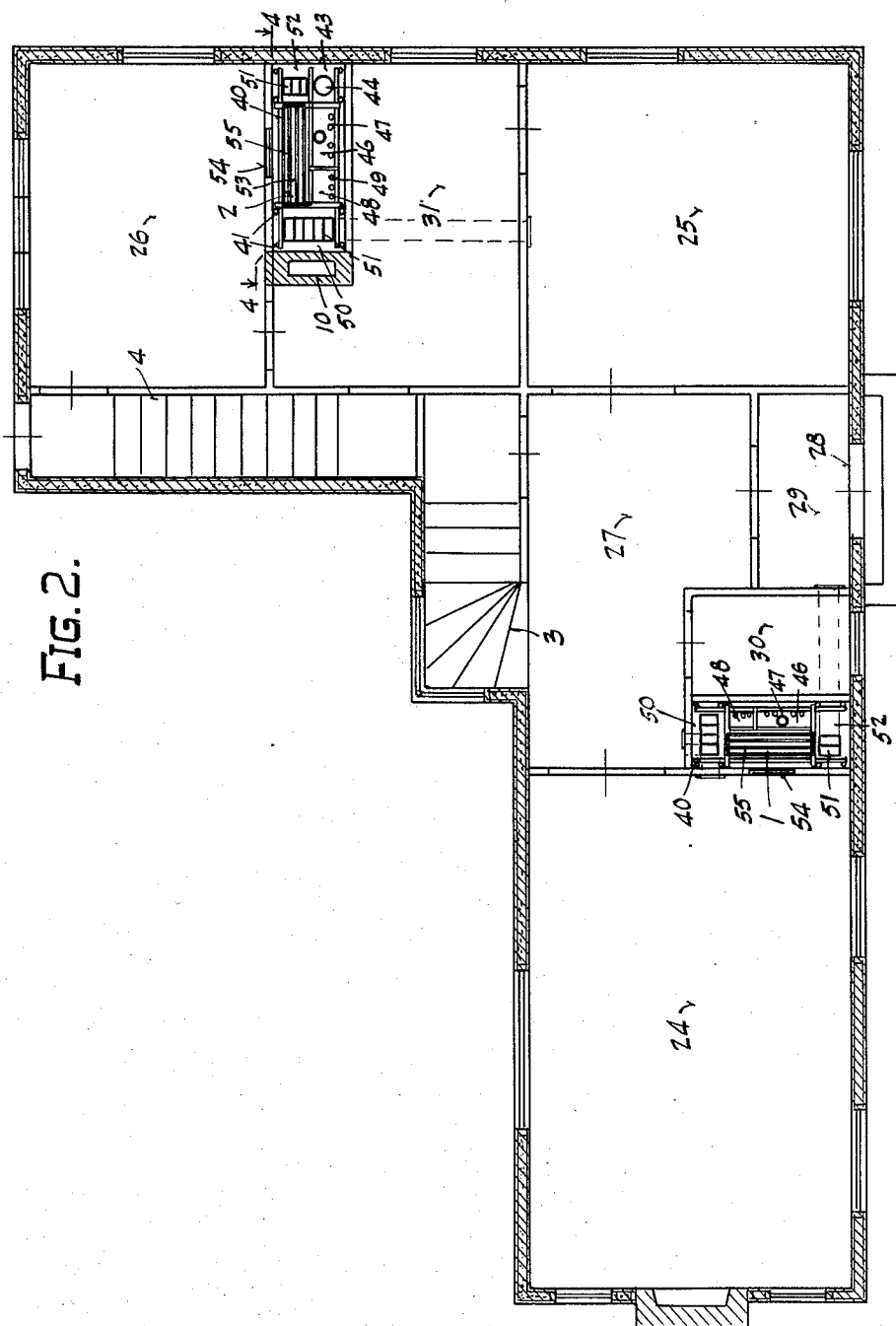
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FIG. 2.



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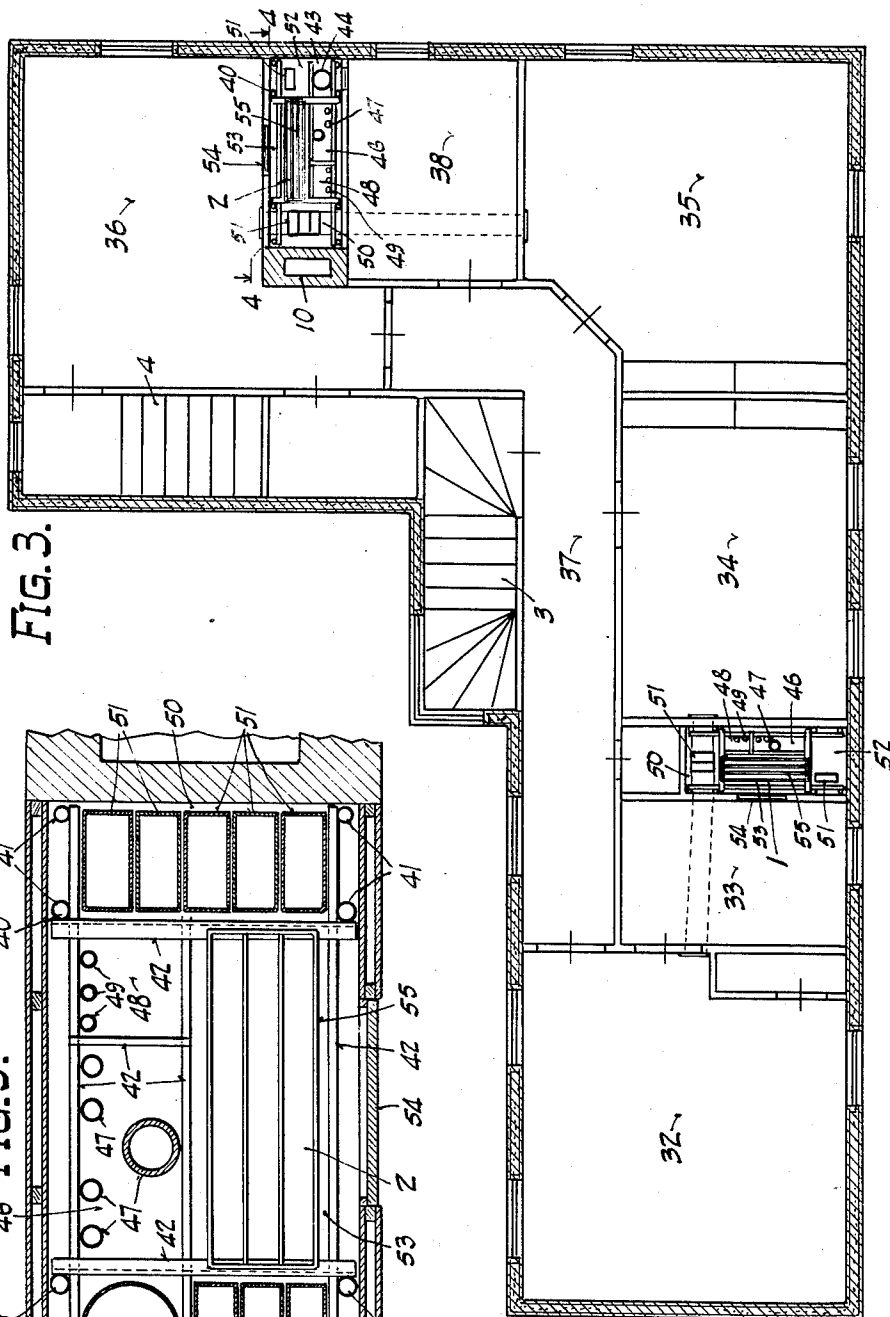
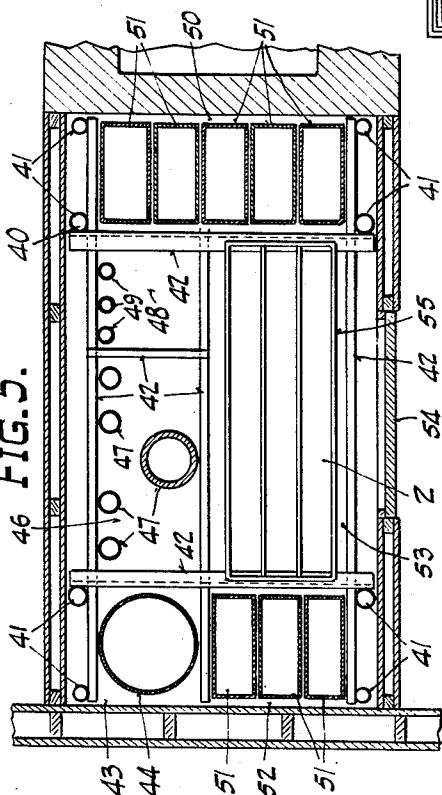


FIG. 5.



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FIG. 4.

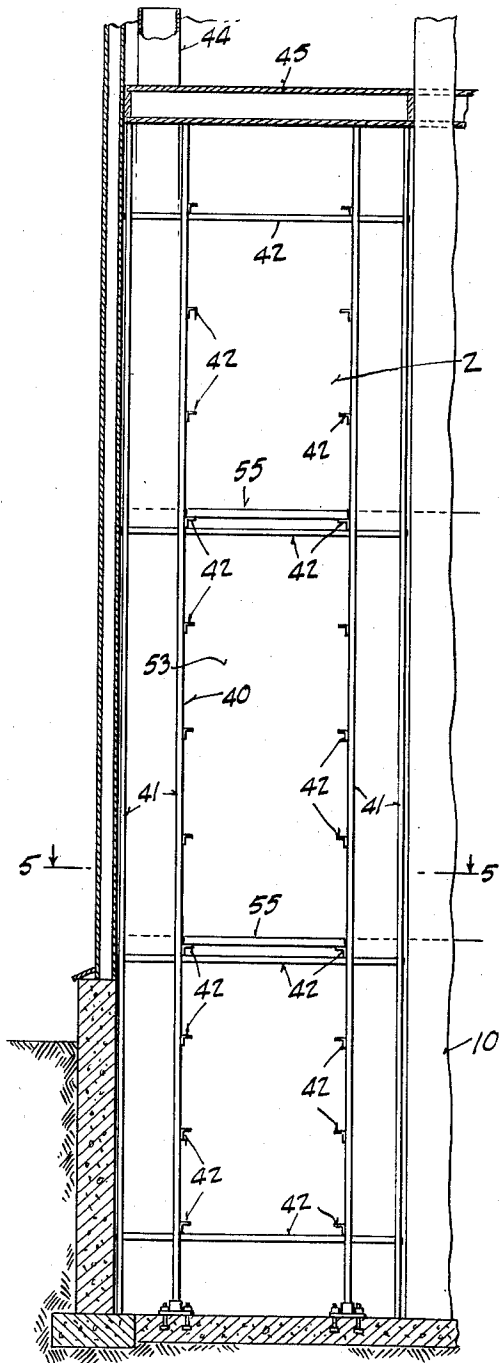


FIG. 6.

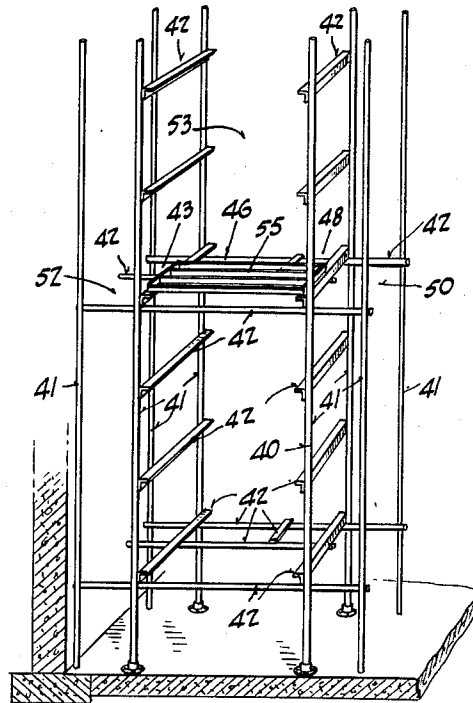
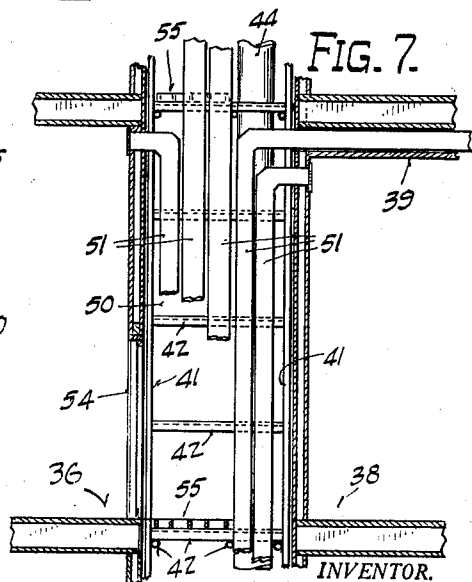


FIG. 7.



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## UNITED STATES PATENT OFFICE

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## HOUSE CONSTRUCTION

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16 Claims. (Cl. 20—1.11)

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This invention relates to house constructions and more particularly to the construction of the larger and finer homes having more than one floor and which have been relatively expensive in the past.

The invention arises from the realization that pre-fabrication of homes as proposed heretofore has been only applicable to small inexpensive one-floor dwellings, whereas much can be done to simplify and systematize the construction of larger more expensive homes without destroying the variability of the architectural design and appearance of such homes.

The larger homes must retain flexibility and individuality as to room sizes and arrangement, and often require several bathrooms on the second floor with a lavatory and kitchen on the first floor. Pre-fabrication of any of these service rooms does not provide the desired individuality, and the construction of such homes has continued much as it was years ago except for the use of improved materials and the like. The standardization and large scale manufacture of a few homes of this character, much as the more expensive automobiles are made, may present ways of providing such homes of better quality at less cost in the future.

The present invention relates more specifically to a system of design and construction of such homes whereby the sanitary and utility service equipment is more readily installed and repaired and a considerable saving in cost of construction is obtained.

The principal object of the invention is to simplify, systematize and improve the construction of houses.

Another object of the invention is to improve the design and facilitate the fabrication of houses by segregating the installation of the sanitary and utility service equipment thereof.

Another object is to avoid delays heretofore encountered in the construction of houses and particularly in the installation and assembly of service equipment.

A more specific object of the invention is to provide one or more pre-located service shafts or columns which serve as the backbone for the construction of the home and which constitute the distribution center for service equipment such as plumbing, wiring, heating and ventilating ducts, and the like to adjacent rooms.

Another object is to fix the location of the service connections in a centralized column or shaft and avoid damage to the structure of the home from the heretofore generally unplanned

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location for such connections by different contractors installing the same at different times in the various partitions.

5 Another object is to centralize the service connections in columns or wells, thereby eliminating vertical connections in the walls so far as possible so that the room design may be varied and movable partitions and panels may be employed without distributing the service connections.

10 Another object is to provide a means of segregating the service equipment of a home to thereby make the choice of design more flexible and substantially reduce the labor cost in its construction.

15 Another object is to support the sanitary and utility service equipment independently of the walls of the house, thereby avoiding cracking of the walls by settling and shrinkage.

20 Another object is to provide ready access to the sanitary and utility service equipment and connections and thereby facilitate the inspection and maintenance thereof and provide for ready extensions of the same.

25 Another object is to reduce fire hazards and facilitate detection of fires.

These and other objects of the invention may be carried out by providing a scaffolding or frame-like unit constituting a shaft or well extending preferably from the basement to the attic and about which the house is built, the service connections being installed therein with distribution lines directly to adjacent rooms and through differential ceiling passageways to other rooms.

35 An embodiment of the invention is illustrated in the accompanying drawings in which:

Figure 1 is a basement plan of a typical home showing the shafts and service units connected thereto;

40 Fig. 2 is a first floor plan for the home of Fig. 1 showing the service units therefor and the distribution lines in general;

Fig. 3 is a similar plan of the second floor;

45 Fig. 4 is a side elevation of the rear service shaft taken by sectioning on the line 4—4 of Figs. 1, 2 and 3;

Fig. 5 is an enlarged horizontal section of the shaft taken on line 5—5 of Fig. 4;

50 Fig. 6 is a perspective view of the foundation showing the early installation of the shafts during erection of the house; and

Fig. 7 is a detail section through a bathroom and adjoining ceilings showing a drop ceiling.

55 The house illustrated in the drawing is of generally L shape having a service shaft or well 1

in the front of the house and a similar shaft or well 2 in the rear of the house. The front stairways 3 are located at the inner side at the juncture of the two branches of the L. If desired, a rear stairway 4 may be provided along the inner side of the rear branch of the L, the stairways going successively from the basement to the first and second floor and the attic.

The basement of the house has recreation room 5 in the front branch of the L entered by the front stairway 3 and partitioned from the furnace room 6 which is provided in the corner of the L. A laundry room 7 is at the rear end of the basement adjacent the stairway 4.

The shaft 1 provides an end wall for the recreation room 5 and partitions set off a vegetable or storage cellar 8 adjacent the furnace room 6 entered by a door from the latter and also a lavatory 9 adjacent the shaft 1 and entered by a door from the hallway leading to the recreation room.

The rear shaft 2 separates the furnace room 6 from the laundry 7, and a combination chimney and incinerator 10 is provided at the inner end wall of shaft 2.

The furnace and air conditioning unit 11 is located centrally of the furnace room 6 and has a chimney pipe 12 connecting the same to the chimney 10. Heating and ventilating ducts 13 extend from the furnace 11 to each of the shafts 1 and 2.

The laundry 7 may contain the usual laundry tubs 14, washing machine 15, clothes drier 16, ironer 17, water-heater 18, and the like.

A hot water pipe 19 extends from water heater 18 to each of the shafts 1 and 2, and likewise a cold water pipe 20 extends to each from the water main 21 entering the building through the basement floor.

Electric wiring enters through the basement wall to a fuse box 22 at the foot of stairs 4 and from it branch lines 23 extend to the shafts 1 and 2. Gas conduits, not shown, may also be provided where gas is needed on the upper floors of the house.

The first floor of the house has a living room 24 above the recreation room 5, a dining room 25 in the corner above the furnace room 6, and a kitchen 26 above the laundry 7. A front hallway 27 extends between the inner end of the living room 24 and the dining room 25, and is entered at one side through the front door 28 and vestibule 29. The stairways 3 lead from the other side of the hallway 27.

The shaft 1 separates the living room 24 from a lavatory 30, the latter being adjacent the vestibule 29, and receiving its plumbing connections from the shaft. The shaft 1 provides heating and ventilating duct connections directly to the living room 24 and to the lavatory 30. The hallway 27 and vestibule 29 receive their heating and ventilating connections from shaft 1 through a drop ceiling of differential height in the lavatory 30.

The rear shaft 2 is adjacent the kitchen 26 and supplies plumbing, heating and ventilating connections and wiring directly thereto. A pantry 31 may be located between the shaft 2 and dining room 25 and has a drop ceiling to provide space for heating and ventilating ducts to the dining room from the shaft.

The second floor plan of the house comprises four bedrooms and two bathrooms. A bedroom 32 is located over the living room 24 with a bathroom 33 between the bedroom and shaft 1. A second bedroom 34 is located adjacent shaft 1

and above lavatory 30 and vestibule 29. A third bedroom 35 is located in the corner above the dining room 25. The fourth bedroom 36 is located above the kitchen 26 and is entered directly by stairway 4. Stairway 3 opens on to a hall 37 which leads to all of the bedrooms. A rear bathroom 38 is located between shaft 2 and bedroom 35, above pantry 31.

The two bathrooms 33 and 38, being located adjacent the respective shafts 1 and 2 receive their plumbing, heating and ventilating connections therefrom. The bathrooms 33 and 38 have lowered differential ceilings 39 (Fig. 7) to provide space for heating and ventilating ducts leading from the respective shafts to the corresponding bedrooms 32 and 35. Bedrooms 34 and 36 receive their heating and ventilating connections directly from the respective shafts 1 and 2.

The detail design and architectural symmetry of the house may vary depending upon the individual taste of the designer and builder, but in each instance the design will embody a segregation of the vertical service ducts into well defined areas such as wells or shafts which will be conveniently located adjacent to the service or utility rooms for the house. Some houses may require only one shaft while others may require several shafts, depending upon the size and general plan of the house.

In constructing the house, a considerable saving in labor and in the carrying out of instructions is obtained by providing a scaffolding 40, built either of wood or metal framework for defining each shaft. As illustrated in Figs. 4, 5 and 6 such a framework may comprise vertical posts 41 joined by horizontal struts 42 in a manner to define certain columnar areas for segregating the different service members. The scaffolding 40 is light and should be independent of the walls of the house.

For instance column 43 in one corner of the shaft constitutes a space for the installation of a clothes chute 44 that extends from an opening in bathroom 38 to the laundry room 7 in the basement. The chute 44 may extend upwardly to the attic 45 and constitute a means of ventilation, if desired.

The column 46 along the side adjacent column 43 constitutes a space for plumbing pipes 47 including hot and cold water pipes and drain and sewer pipes. The column 48 next adjacent column 46 on the same side constitutes a space for the electrical conduits 49.

End column 50 constitutes a space for heating ducts 51, as does the opposite column 52 adjacent column 43 at the other end. The intermediate large column 53 along the side opposite columns 46 and 48 provides a space for the return of cold air from the rooms to the furnace and air conditioner 11 or for ventilation of the house. The inner end walls of column 53 may have sufficient struts 42 to provide a ladder for a workman to climb up and down therein to install, repair or replace service equipment in the shaft, suitable entrance being provided thereto in the basement, and if desirable, at each floor level through a suitable removable wall panel 54.

The column 53 may have removable floor gratings 55 at each floor level for supporting a workman in the shaft.

The several pipes and conduits have branch connections at the different floor levels for distributing the sanitary and utility services to adjacent rooms. For this purpose the term "floor level" is intended to include branch connections

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at any height adapted to service a given floor or set of rooms on a single floor.

In constructing the house, the scaffolding for the shafts should be erected early, before the frame of the house is erected or completed, as shown in Fig. 6. The service piping, wiring and ducts may be installed in the shafts at any time thereafter without interfering with or damaging the frame of the house and any of the partitions.

The shafts are eventually surrounded by the adjacent partitions and walls of the house to close the same in. Where the scaffolding is made sufficiently strong it is possible to provide for the hanging of fixtures such as the bathtub and the like upon the scaffolding, thereby removing their weight from the walls of the house and avoiding a tendency of the walls to settle and crack.

The invention provides a system of architectural design and construction of homes, generally of the single family type, which may be employed in either the so-called pre-fabricated home or individually designed home. It provides a flexibility of design by segregating the utility pipes, ducts and wiring from the partitions, thereby facilitating the use of movable panels and the like for partitions.

Various embodiments of the invention may be employed within the scope of the accompanying claims.

#### I claim:

1. In a house of the class described having at least two floors with living quarters on the first floor and sleeping quarters on the second floor, a vertical well disposed between separate walls constituting a double wall structure separating adjacent rooms one of which on each floor is a service room, said well extending continuously and vertically through both floors and containing the service connections including the plumbing pipes and the heating and ventilating ducts for nearby rooms, and a frame structure supported from the ground and extending upwardly within said well substantially independent of the adjacent walls and floors of the house to carry and support the several components of said pipes and ducts.

2. In a house of the class described having at least two floors with living quarters on the first floor and sleeping quarters on the second floor, a vertical well disposed between separate walls constituting a double wall structure separating adjacent rooms one of which on each floor is a service room, said well extending continuously and vertically through both floors and containing the service connections including the plumbing pipes and the heating and ventilating ducts for nearby rooms, and a frame structure supported from the ground and extending upwardly within said well substantially independent of the adjacent walls and floors of the house to carry and support the several components of said pipes and ducts, and said service room having a drop ceiling therein for accommodating a branch heating and ventilating duct extending horizontally across the same to the next room which is remote from the well.

3. In a house having a basement and at least two floors with an air conditioning plant in the basement, a vertical shaft extending upwardly from the basement between separate walls constituting a double wall structure separating adjacent rooms and located adjacent service rooms on the floors of the house, plumbing pipes extending upwardly in said shaft from the basement

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to said service rooms, air conditioning ducts extending from said plant upwardly through said shaft to the several floor levels, branch ducts leading to nearby rooms from the ducts in said shaft, and a frame structure supported from the basement floor and extending upwardly within said shaft substantially independent of the adjacent walls and floors of the house to carry and support said pipes and ducts located in said shaft.

4. In a house having a basement and at least two floors with an air conditioning plant in the basement, a vertical shaft extending upwardly from the basement between separate walls constituting a double wall structure separating adjacent rooms and located adjacent service rooms on the floors of the house, plumbing pipes extending upwardly in said shaft from the basement to said service rooms, air conditioning ducts extending from said plant upwardly through said shaft to the several floor levels, branch ducts leading to nearby rooms from the ducts in said shaft, at least a part of the ceiling in said service rooms being lowered to provide an enclosure for said branch ducts passing from said shaft to a room on the opposite side of the respective service room, and a frame structure supported from the basement floor and extending upwardly within said shaft substantially independent of the adjacent walls and floors of the house to carry and support said pipes and ducts located in said shaft.

5. In a house having a basement and at least two floors with a laundry room and a furnace in the basement, a vertical shaft extending upwardly from adjacent the laundry in said basement between separate walls constituting a double wall structure separating adjacent rooms and located adjacent service rooms on the floors of the house, plumbing pipes extending upwardly in said shaft from the basement to said service rooms and including hot and cold water supply pipes and drains, heating ducts extending upwardly in said shaft from said furnace and having branch ducts to the nearby rooms, electric conduits extending upwardly in said shaft from an electric junction box in the basement to branch lines at the several floor levels, a clothes chute in said shaft extending downwardly from at least one of said service rooms to the basement, and a frame structure supported from the basement floor and extending upwardly within said shaft substantially independent of the adjacent walls and floors of the house to carry and support said pipes, ducts, conduits and chute contained in said shaft.

6. In a house of the class described, a vertical shaft defined by separate walls of the house surrounding the same, said shaft containing hot and cold water piping, drain pipes, heating and ventilating conduits, and electrical conduits, and branches for said pipes and conduits at the floor levels of the house for distributing the same to adjacent rooms, and a frame structure supported from the ground and extending upwardly within said shaft substantially independent of the adjacent walls of the house to carry and support said piping, pipes and conduits located in said shaft.

7. In a house of the class described having several floor levels above the ground, a vertical well defined by the separate walls constituting a double wall structure separating adjacent rooms, and a lightweight frame structure supported from the ground and extending upwardly within said well substantially independent of the adjacent walls and floors of the house to carry

and support the service conduits for plumbing, heating and lighting with connections at the floor levels to the respective rooms of the house.

8. In a house of the class described having a plurality of floors above the ground, a vertical well defined by the separate walls constituting a double wall structure separating adjacent rooms, and a lightweight frame structure supported from the ground and extending upwardly within said well substantially independent of the adjacent walls and floors of the house to carry and support the service conduits for plumbing, heating and lighting with connections at the floor levels to the respective rooms of the house, said structure serving to partition said well into vertical columns for separately containing and segregating said service conduits.

9. In a house of the class described having a plurality of floors above the ground, a vertical well defined by separate walls constituting a double wall structure separating adjacent rooms, and a scaffolding therein supported from the ground and extending upwardly substantially independent of the adjacent walls and floors of the house for supporting service conduits.

10. In a house of the class described having a plurality of floors above the ground, a vertical well defined by separate walls constituting a double wall structure separating adjacent rooms, and a scaffolding therein with means separating the well into vertical columns for the segregation of sanitary and utility service connections, said scaffolding being supported from the ground and extending upwardly within said well substantially independent of the adjacent walls and floors of the house.

11. In a house of the class described having a plurality of floors above the ground, a vertical well defined by separate walls constituting a double wall structure separating adjacent rooms, and a scaffolding therein having segregated vertical columns for service conduits, with at least one of said columns having ladder supports therein for the use of a workman in installing, repairing and replacing service connections, said scaffolding being supported from the ground and extending upwardly within said well substantially independent of the adjacent walls and floors of the house.

12. In the construction of houses of the class described having a plurality of floors above the ground level, constructing the foundation and erecting a tower structure constituting a service shaft for plumbing, ventilating ducts and wiring, and then building the house around said tower with service rooms adjacent to the tower on the several floors and with the walls and floors of the house adjacent to said shaft substantially independent of said tower.

13. In the construction of houses of the class described having a plurality of floors above the ground level, constructing the foundation and erecting a scaffolding tower constituting a service shaft, installing plumbing, ventilating ducts and wiring in said shaft, then building the house around said tower with service rooms adjacent to the tower on the several floors and with the walls and floors of the house adjacent to said shaft substantially independent of said tower, and connecting the service equipment to the plumbing and ducts in said shaft.

14. In the construction of houses of the class

described having a plurality of floors above the ground, constructing a tower supported from the ground and extending upwardly through the floors and between adjacent rooms substantially independent of the adjacent walls and floors of the house, and installing plumbing, ventilating ducts and wiring in segregated columns in said tower and without regard to the construction of the remainder of the house.

15. In a house of the class described having at least two floors of living and sleeping rooms and a basement heating equipment and service connections with utility conduits leading therefrom to rooms on said floors, a tower extending upwardly through the floors from said basement and containing the several utility conduits in a segregated arrangement therein, the walls of the rooms adjacent to said tower enclosing the same and constituting a service shaft separate from the adjacent rooms and disposed therebetween, said tower being supported from the basement floor and extending upwardly in said shaft substantially independent of the adjacent walls and floors of the house.

16. In a house of the class described having at least two floors of living and sleeping rooms and a basement heating equipment and service connections with utility conduits leading therefrom to rooms on said floors, a tower extending upwardly through the floors from said basement and containing the several utility conduits in a segregated arrangement therein, the walls of the rooms adjacent to said tower enclosing the same and being structurally substantially independent therefrom to constitute a service shaft separate from the adjacent rooms and disposed therebetween, said shaft having a vertical columnar space adapted for entrance of a workman, and said tower having ladder rungs on one side of said space for the workman.

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