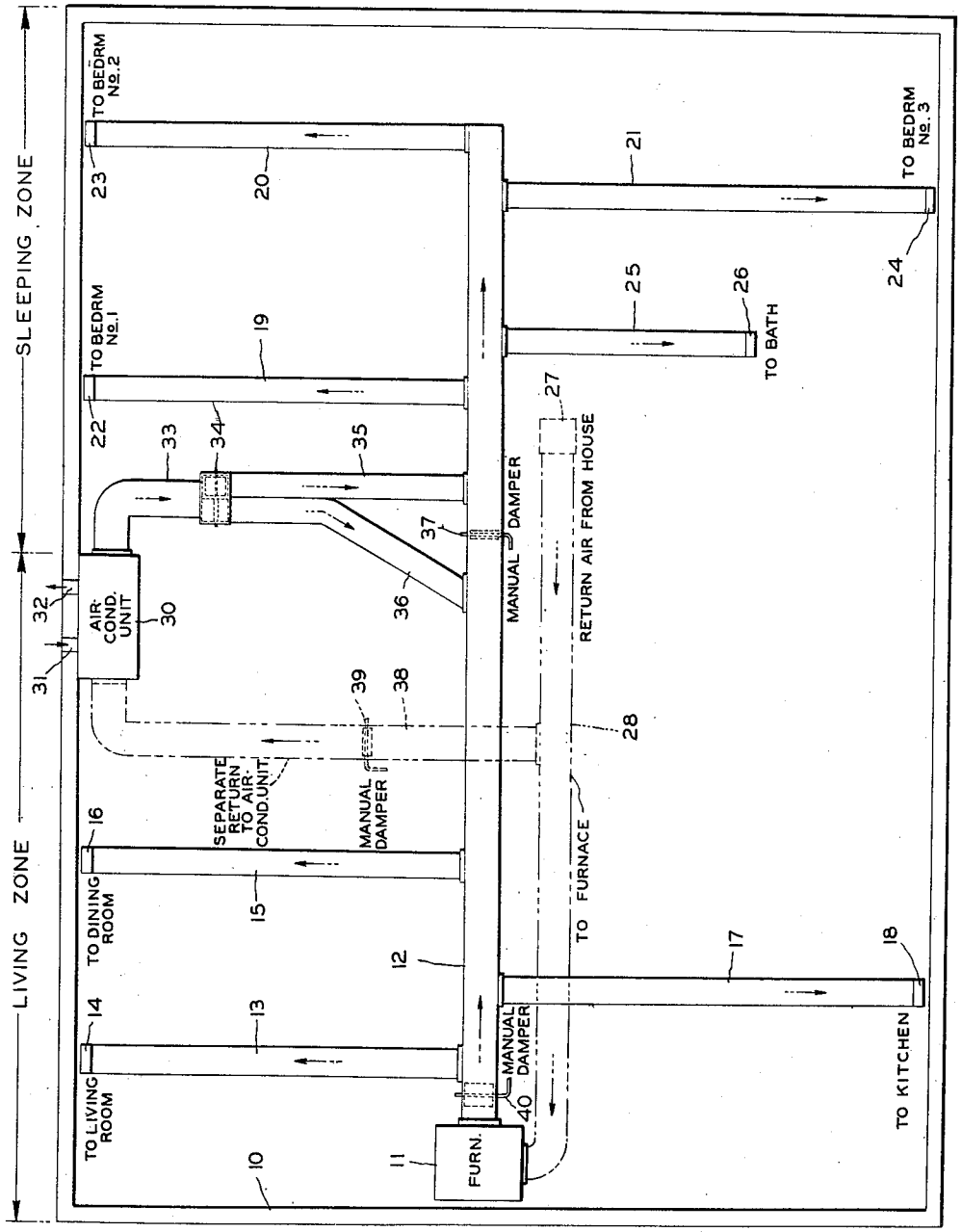
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ECONOMY AIR CONDITIONING SYSTEM

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ECONOMY AIR CONDITIONING SYSTEM

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This invention relates to an economy air conditioning system for buildings and has for an object the provision of an improved air conditioning system for economically cooling the air in a building, or for dehumidifying it, or for both cooling and dehumidifying it according to the weather conditions.

A further object of the invention is to provide such an air conditioning system which may be utilized in conjunction with an existing hot air furnace installation.

In my copending application Serial Number 325,643 filed December 12, 1952, now Patent No. 2,753,157, entitled "Economy Air Conditioning System for Buildings," I have disclosed a complete air conditioning system adapted to be installed as a unit to provide heating as well as cooling and dehumidifying. The present invention provides an improved cooling system for cooling an entire building from a central cooler, which may be employed in conjunction with an existing furnace installation by relatively minor modification of the hot air ducts. This results in a material reduction not only in the initial cost of the installation, but in the operating costs. This is due in part to the fact that the unit employs much less electrical power than would a plurality of individual room cooling units, and further, since the unit itself is air cooled, large water bills such as are occasioned by water cooled units are avoided.

A further object of the invention is the provision of means in association with the system whereby the living quarters of the house, such as the living room, dining room, and kitchen are cooled during the day, while the cooled air is directed to the bedrooms during the night, as an automatic timing or manual device may be provided for shifting from one section to the other at a desired time.

A further object of the invention is the provision of damper means in the furnace ducts whereby the furnace may be cut out of the system during the summer months, and the cooling unit cut out of the system during the winter months with a minimum of effort and difficulty, merely by the adjustment of suitably positioned manually operable dampers in the furnace ducts.

A further object is the provision of an automatically operable damper for selectively directing cooled air to either the sleeping quarters or the living quarters at predetermined times. This damper preferably takes the form of that shown in my copending application Serial Number 357,740 and titled "Adjustable Damper," filed May 27, 1953, issued as Patent No. 2,699,106 on Jan. 11, 1955.

With the foregoing and other objects in view, this invention comprises the combination, construction and arrangement of parts hereinafter set forth, claimed and disclosed in the accompanying drawing, wherein:

The single figure of the drawing is a schematic representation of the heating system of, illustratively, a dwelling having three bedrooms, showing the cooling system of the instant invention in association therewith.

Referring now to the drawing in detail the outline of the dwelling or the like is generally indicated at **10** and contains a conventional hot air furnace **11** customarily located

in the basement. A main heating duct **12** extends from furnace **11** and is provided with a branch duct **13** leading to an outlet **14** in the living room, a duct **15** leading to an outlet **16** in the dining room, and a duct **17** leading to an outlet **18** in the kitchen. These three ducts may be considered as constituting, when the cooling system is in operation, as will be more fully described hereinafter, the cooling means for the living quarters for the house. Duct **12** is also provided with branch ducts **19**, **20** and **21** leading to outlets **22**, **23** and **24** respectively in the three bedrooms of a three bedroom house, and a branch duct **25** leading to an outlet **26** in the bathroom. The ducts **19**, **20**, **21** and **25** may be considered as providing means for cooling the sleeping zone of the house.

Any suitable number of return air ducts may be provided at desired locations, but in the illustrative embodiment shown, there is disclosed only a centrally positioned return duct **27**, from which a conduit **28** leads back to the furnace **11**.

The above described ducts are largely conventional, and apply to any hot air type of furnace. In incorporating the cooling system of the instant invention into the heating system, an air cooling unit **30** of any desired type is suitably located in the dwelling, and is provided with an air inlet **31** and outlet **32** communicating with the outside atmosphere for cooling the unit itself. From the unit **30** a duct **33** leads to a damper **34**, from which extend two diverging ducts **35** and **36**, respectively. The damper **34** may be automatically operated and is preferably of the type described in my Patent 2,699,106 above mentioned, for selectively directing the air of the cooling unit **30** into one of ducts **35** or **36** in accordance with the zone of the house to be cooled. Ducts **35** and **36** communicate with duct **12** on opposite sides of a manually operated damper **37**, the purpose and use of which will be more fully pointed out hereinafter.

A return duct **38** extends from return duct **28** to the air cooling unit **30**, and has positioned therein a manually operable damper **39**. A third manually operable damper **40** is positioned in the main supply duct **12** between the furnace **11** and the first duct **13**.

In the use and operation of the device when it is desired to heat the house during the winter months, the damper **39** is closed, and the damper **34** may be adjusted as described in my above mentioned application Serial Number 357,740 to close both ducts **35** and **36**. Dampers **40** and **37** are opened and when the furnace is started heat passes through all of the branch ducts to heat the entire house, the heated air returning to the furnace for reheating through the duct **28**.

During the warmer months when it is desired to cool the house, dampers **37** and **40** are closed, damper **39** is opened, and the damper **34** positioned in such manner that either duct **35** or duct **36** is opened while the other is closed. With this arrangement air is cooled in the unit **30** and passes during the day through duct **36** into duct **12** and then outwardly through the ducts **13**, **15** and **17** to cool the living room, dining room and kitchen, respectively. The damper **37** and the damper **34** prevent passage of air from the unit to the sleeping zone. The return air after it has become heated passes through the duct **28** and the duct **38** back to the unit **30**, the damper **40** precluding passage of air through the furnace **11**. During the night, however, when it is desired to cool the sleeping zone the position of the damper **34** is shifted, either manually or by any desired conventional clockwork mechanism to close the duct **36** and open the duct **35** whereupon cooled air from unit **30** is passed to the bedrooms and bath through the ducts **19**, **20**, **21** and **25**, respectively, the air returning in the same manner through the ducts **28** and **38**.

While the device has been shown and the structure described in detail, it is obvious that this invention is not to

be considered as being limited to the exact form disclosed, and that changes in detail and construction may be made therein within the scope of what is claimed, without departing from the spirit of this invention.

Having thus set forth and disclosed the nature of this invention, what is claimed is:

1. An economy air cooling system for use in a building having a hot air furnace, a main air duct extending therefrom, branch air ducts extending from the main air duct to the various rooms, and an air return duct to the hot air furnace, the building rooms being divided into a sleeping zone and a living zone; damper means in the main air duct dividing the branch air ducts leading to one zone from the branch air ducts leading to the other zone, a second damper means in the main air duct for closing the main air duct to the hot air furnace, an air cooling unit, an air return duct branching from the hot air furnace air return duct and leading to said air cooling unit, damper means in said branching air return duct, a cooled air duct leading from said air cooling unit, said cooled air duct being bifurcated and providing two separate cooled air ducts leading therefrom and entering said main air duct at points on opposite ends of said main duct dividing damper means, damper means adjacent the point of bifurcation operable for selectively directing cooled air from said air cooling unit into either of but not both of said two separate cooled air ducts and thus through one part of the divided main air duct and its branch air ducts to one but not both zones of the building, whereby when both said main air duct damper means are opened and said branching air return duct damper means is closed, said air cooling unit is operatively cut off from all said ducts and the hot air furnace is operatively connected to all said ducts for normal operation, and when both said main air duct damper means are closed and said branching air return duct damper means is open, the hot air furnace is operatively cut off from all said ducts and said air cooling unit is selectively operatively connected to either but not both building zones.

2. The economy air cooling system of claim 1, and vent means communicating said air cooling unit to the atmosphere outside the building for cooling the mechanism of said air cooling unit.

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