TYPICAL HEATING SPECIFICATIONS
"D" Series System for Office Buildings, Hotels, Apartments, Etc.

1. General Conditions. The general conditions governing this work shall be those established as standard by the American Institute of Architects.

2. Construction and Material. The heating apparatus proposed includes the furnishing, delivery, and erection on the premises of all necessary material and labor, which shall be first-class in all particulars, and in accordance with specifications and plans.

3. Boiler. The steam boiler shall be a..... with guaranteed rating for .....sq. ft. of radiation installed upon suitable foundation, and equipped with all necessary connections and trimmings, including a safety valve set to blow at 10 lb. pressure, a Dunham Compound Gauge 15 lb. x 30 in. vacuum and a 7 in. Dunham Damper Regulator. (Omit Regulator on gas fired and automatic oil fired installations.)

4. Smoke Pipe. Connect boiler to chimney with suitable iron smoke pipe same size as boiler smoke outlet. Provide Check Damper and hand stop damper between check damper and boiler.

5. Reducing Pressure Valve. On all systems not equipped with full automatic control, install two Sub-Atmospheric Dunham Reducing Pressure Valves, Type 302 (of proper size), with necessary gate valves and a Dunham 15 lb. x 30 in. compound gauge, all in accordance with manufacturer's details and instructions.

(Engineers and Architects will be furnished on application with suitable specification designed to meet conditions where Centralized Thermostatic Control is to be used or when it is desired to divide up the mains so as to carry more heat on one side of the building than on the other.)

6. Pipe and Fitting. Furnish and erect with tight connections all necessary piping of sizes shown on plans and run as indicated, supported and properly graded to insure free and noiseless circulation, using fittings of cast iron of standard quality. The ends of all pipes shall be reamed or filed. Proper provision must be made for expansion.

7. All steam tappings in boiler shall be connected full size of tapping into a steam header which shall be dripped to the return header through a bleeder. Install horizontal swing check valve with brass disc in bleeder. All spring pieces to steam and return mains shall be taken off the top of mains at 45 deg. On down-feed systems take the spring pieces from the bottom of steam main at 90 deg.

8. The end of each steam main shall be dripped as indicated on the plans through a Dunham Trap into the return main; a full sized scale pocket must be provided and the Trap shall be installed at least 4 ft. from the scale pocket, and located above the return piping, into which they discharge by gravity. All drip points must discharge into return piping without the use of lift connections. A gate valve shall be installed on the inlet side of each Dunham Trap used for dripping purposes. All in accord with details furnished by manufacturer.

9. Grade steam mains ½ in. in 10 ft. Grade return mains 1 in. in 10 ft. All steam supply branches such as spring pieces, offsets in steam risers and runouts to radiators shall in each case be installed one size larger than the vertical pipes to which they connect and shall be given as much grade as possible. ½ in. per foot is preferable.

10. Return mains shall be connected to the Dunham Differential Vacuum Pump as shown in detail furnished by manufacturer.

11. Risers are to be run concealed or in the open as directed by the architect. Each down feed steam riser must be dripped into the return through a Dunham Trap. Install traps as instructed by manufacturer. All concealed piping must be tested at 15 lb. water pressure before being concealed.

12. All union connections, flanges, packing nuts on gate and globe valves and on gauge glass of boiler must be drawn up tight so as to prevent air leaking into system when under a high vacuum. This work should be performed after system is completed and while it is working with a vacuum in both steam and return lines.

13. The System when finished shall be tested for tightness. When system is filled with steam, drop the fire when 20 in. of vacuum is secured and stop pump. After an hour there shall be at least 10 in. of vacuum remaining on the gauge.

14. Floor Plates, Sleeves. Furnish proper floor and ceiling plates, and protecting sleeves on all pipes passing through floors or finished partitions.

15. Differential Vacuum Pump. Furnish and install one (or duplex) Dunham Differential Vacuum Pump of "D" Series, size ....., having a rated capacity of .....sq. ft. of direct radiation. The pump (or pumps) shall be installed and connected in accordance with manufacturer's instructions and details.

16. Check Valves. Check valves shall be of the horizontal swing type with brass disc and of the best grade and make obtainable. They shall be installed as called for by the plans, and in accordance with details supplied with pump.

17. Radiation. Furnish and install radiation as shown on the plans. It shall consist of ..... sq. ft. of direct radiation of approved make. All radiators must be of hot water pattern provided with ¾ in. top inlet tapping and with ½ in. eccentric bushing in the return tapping. All air valve tappings shall be plugged.

18. Radiator Traps and Valves. Each radiator shall be provided with a Dunham Thermostatic Radiator Trap of suitable capacity installed at the return outlet and with a Dunham Packless Radiator Valve with Regulating Plate installed at inlet connection. The plates shall not be inserted in the valves until after the system has been cleaned, but before final test is made.

19. Painting. All exposed piping in finished rooms, and all radiators shall be painted a priming coat of flat paint and thereafter painted or enameled as directed by architect. All uncovered piping in basement, boiler front and other exposed parts shall be painted one coat of black asphaltum. The finishing coat of paint must be applied when the entire system is under vacuum, so that paint will fill up air leaks.

20. Covering. Cover all steam piping in basement (and in roof space on down feed systems) with four-ply, 1 in. thick asbestos sectional covering, fittings with asbestos cement. Cover all steam and return risers and also other piping run concealed in outside walls with two-ply, ½ in. thick asbestos sectional covering. Cover boiler as specified by boiler manufacturer.

21. Finishing Up. Thoroughly blow down and clean out system under a steam pressure of 5 lb., allowing condensate to be wasted to sewer.

Operate system a week, using Dunham Temporary Caps on traps, or Dunham Temporary Elbows on the return of radiators. Surface blow-off the boiler, as follows:

Remove the safety valve and connect a temporary blow-off pipe to the safety valve tapping, extending it outside or to some suitable drain. Shut-off all radiator valves or valves in main. Fill the boiler with water to top of gauge glass. Build a very hot fire and blow steam and water out through the safety valve tapping and pipe connected thereto. Raise and keep pressure up to 10 lb.; fire hard, supply cold water constantly in at bottom of the boiler, maintaining water line at top of gauge glass; keep up continuously for six hours; during the last two hours of the period fill boiler full of water, allowing the hot water to flow from it under the said pressure through and out of the top blow-off. At the end of the period, close the water feed valve, bring the pressure up to 10 lb., open blow-off at bottom of boiler, draw the fire quickly, and entirely drain the boiler. Allow the boiler to cool, replace the safety valve, and fill the boiler slowly.

22. Guarantee. The Heating Contractor shall guarantee the apparatus installed to circulate steam thoroughly through every radiator without noise, under a pressure differential of 1 in. mercury between steam and return mains, with a vacuum of 10 in. in steam main. If the apparatus shall fail to accomplish this guarantee by reason of any defect developing within the period of one full heating season and that defect is due to faulty material or poor workmanship, the Heating Contractor shall remedy such defect at his own cost within reasonable time after notice thereof.

23. Finally. Nothing herein contained can be construed to relieve Heating Contractor from making good and perfect work in all usual details of construction, and he will be held responsible to provide and furnish necessary material and to perform all necessary labor and to bear all expenses incidental to the satisfactory completion of the work.

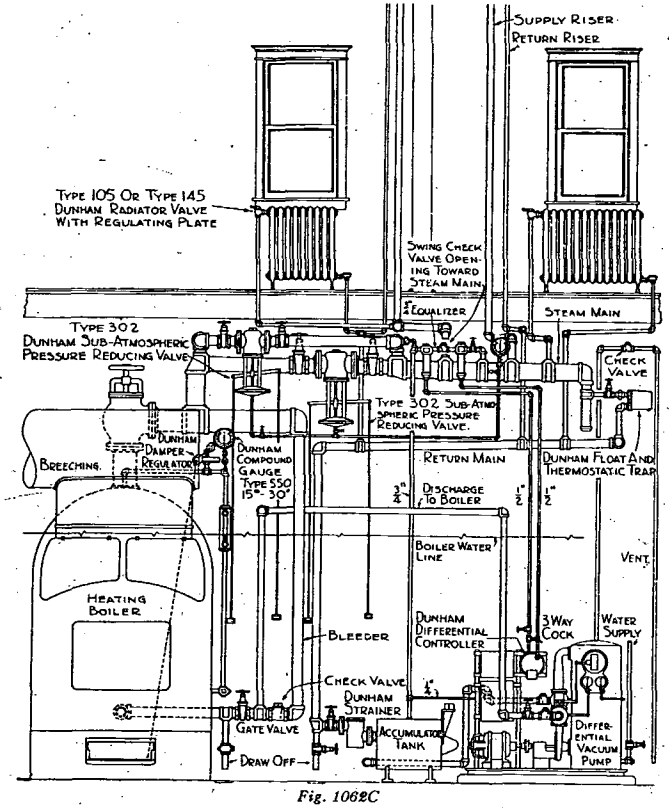

Fig. 1062C

Method of Installing Dunham Differential Vacuum Heating System—"D" Series—as applied to the heating of office buildings, hotels, apartment houses, etc.

C. A. Dunham Co. Specialties, Heating