

the warm air vault under the respective Chambers, where it is carried nearly all round them of a similar size.

In the centre of the boiler-house a 6-inch branch runs southward from the main steam pipe, to a point 10 feet beyond the inner face of the wall, where it is divided into two 4-inch pipes, leading right and left into the vaults under the central portion of the Building. From the same point a 2-inch pipe is carried into the vault under the main vestibule, where it branches off into two 1½-inch pipes. Each of these are again branched off into two 1-inch pipes, which are extended to the coils in the front of the Building, immediately under the ornamental arched openings in the main walls, on each side of the central entrance.

The leading pipes are, in all cases, placed immediately over the perforations in the covering of the cold air ducts, so that the entering current is at once subjected to the action of heat. The temperature of the air is further increased by the large heating surface of numerous coils, placed in the upper portion of the vaults. These are generally composed of four rows, and eight in width, of 1-inch pipe (or between 700 and 800 lineal feet each), laid to a gradual inclination. The highest part of each coil is connected with a vertical feed from the leading steam pipes, and at the lowest point it has a branch to the return pipes, the latter being, in every case, of equal capacity to the main steam pipes, and laid on the opposite side of the vaults. The coils are placed about 2 feet apart, and occupy nearly the whole length of all the warm air vaults.

It will be evident, that the steam, after having circulated through such a length of pipe, has lost a considerable portion of its heat by radiation, so that at the point of junction with the main return pipes, there is a quantity of water. This descends into that portion of the pipe which runs along in front of the boilers, below the level of the floor, and is connected with them by branches and valves, for the purpose of admitting the water, which (by the operation of gravity, combined with the pressure of unexhausted steam in the pipe) enters when the pressures in the main return pipes and boilers are nearly alike.

In the arches over the vaults around the Chambers, there are numerous openings for the exit of warm air. From these flues are carried up in the side walls, and the air is admitted to the Chamber by the line of perforated brass gratings, 6½ feet over the floor of the House. This can be so adjusted as to regulate the supply. Air also passes through the ornamental grating under the gallery fronts.

The other portions of the Building, which are heated on the Vault System, have flues conveying the warm air directly to registers in the various rooms.

The system of heating by box coils is applied principally to the wings. The main steam and return pipes are extended from the warm air vaults, and raised nearly to the basement ceiling, and from these branch pipes run up in the flues from the cold air ducts to the coils in the various rooms, passages, &c., on the upper floors.

The cold air flues have, in all cases, an opening behind the coils, which are of different sizes—placed in recesses cut in the walls—and have in front cast-iron screens for the admission of warm air. There are also branch pipes from the ends of the vaults along the front portion of the wings and part of the rear, and one descending branch from the ceiling, which heats several of the basement rooms, in rear of the wing. These connect in a return pipe in the vault, which is carried separately to a tank in the boiler-house. Similar arrangements are adopted for heating the dining-rooms, closets, &c., in that portion of the basement alongside both Houses. Steam pipes are also carried up to, and along the attics to the angle towers, where coils are placed in the tank rooms, for the purpose of preventing the water freezing during winter. Coils of steam pipes are also placed in the ventilating towers, at the north end of the Chambers, to increase the upward draught.

*Ventilation.*—Two modes have been adopted for the ventilation of the Chambers, one termed the "Upward System," and the other the "Downward System."

The latter provides for drawing off the vitiated air near the floor, through perforated gratings, in the risers of the platforms, on which the Members' seats are placed. These gratings open into spaces between the arches under the floors of the Houses, which are connected at several places with foul air ducts running around the Chambers in the basement passages. These ducts are all joined at the north-east and north-west angles of the respective Houses, and from thence extended, so as to enter the main extracting shaft, at a level of 7 feet over the boiler-house floor.