

Prosecution for Unnecessary Furnace Smoke.—There have been in Sheffield (and probably other towns) many prosecutions for the emission of unnecessary smoke from boilers and furnaces served by the same chimney, with convictions and heavy penalties, but there has been only one case (as far as the writer knows) in which a firm has been prosecuted for *unnecessary furnace smoke only, emitted from a chimney serving furnaces used for the Special Heat Treatment of Steel.*

This case is of importance to every owner of a metallurgical furnace of any sort or size, for conviction was secured, and an appeal dismissed. Thus it is established that unnecessary furnace smoke, much or little, is a statutory nuisance, and that manufacturers must prevent it or be penalised.

CHAPTER XII.

UTILISATION OF WASTE HEAT FROM METALLURGICAL FURNACES.

Waste Heat Boilers.—Many manufacturers, with the double object in view of securing economy, and a reduction of the metallurgical furnace smoke nuisance, have put down Waste Heat Boilers. The gases having done part of their work in the furnaces are diverted, instead of going direct to the chimney and being discharged, and passed through the waste heat boiler, in their passage generating steam, and are then discharged from the chimney. By this process sufficient steam is generated to drive the whole of some manufacturers' machinery. But the whole of the gases are not consumed, for some pass through the boiler unconsumed into the atmosphere, creating a smoke nuisance and a waste of fuel.

Waste Heat Auxiliary Grate Boilers.—In order to burn the whole of the gases after leaving the furnaces, it is necessary on their entering the waste heat boiler to pass them over an incandescent fire, which consumes them, utilising the whole of their heat value and in this way creating no smoke nuisance.

For years, waste heat auxiliary grate boilers have been on the market, but few comparatively have been put down in spite of their great economical and smoke preventing claims.

Cochran Furnace Smoke Prevention System.—Fig. 34 shows the Cochran system for the utilisation of waste gases, and the prevention of smoke.

The actual boiler shown is 6 feet 6 inches in diameter

by 14 feet 6 inches in height, and has a total heating surface of 500 square feet, working at 100 lbs. pressure,

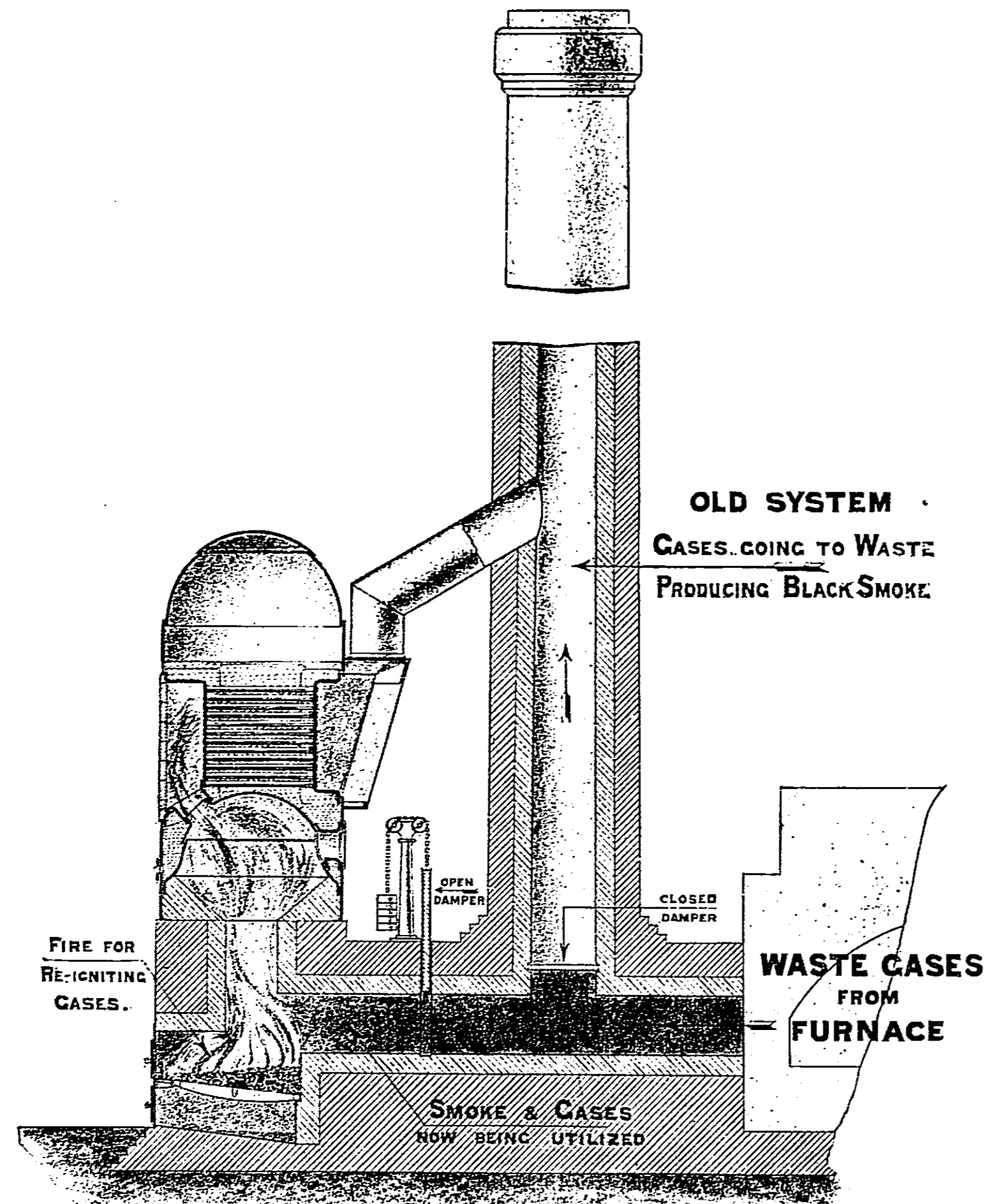


Fig. 34.—Cochran System for the Utilisation of Waste Gases and Prevention of Smoke.

it takes up very little floor space and is of special construction.

For many years at Cochran's works it has been attached to a large plate furnace. The gases and heat from this furnace pass through the boiler, burn the unconsumed gases, generate steam, and prevent the emission of black smoke. Needless to say, there has been a considerable saving to the firm, compared with the old system, which was to allow the gases to go direct from the furnace up the furnace chimney, from which they passed into the atmosphere, in the form of dense volumes of black smoke. The system is very practical, a simple one, and is easily understood by referring to the illustration.

Fig. 35 shows the large plate furnace attached to the Cochran boiler, and Fig. 36 shows another view of the same furnace and boiler. In the latter figure the chimney on the left pouring out black smoke shows the result of allowing the smoke from the furnace to pass direct up the furnace chimney, but when diverted and passed through the Cochran boiler as shown by the chimney on the right practically no smoke is occasioned.

The scheme as shown in the illustration (Fig. 37) possesses advantages over the previous one (which has been working satisfactorily for many years), especially in the fact that it is more simple and the auxiliary grate being in its normal position aids materially in raising steam, and, in fact, amplifies the heated gases if they are insufficient to steam the boiler.

Waste Heat Furnaces.—In cases (and there are many of them) where steam power is not required, waste heat furnaces should be put down for the utilisation of the waste heat.

The smoke and heat leaving the furnaces would be diverted and passed through the waste heat furnace, used in re-heating various kinds of metals, and the products of combustion emitted from the chimney would not constitute a smoke nuisance.

Necessary Smoke but Unnecessary Emissions.—As mentioned previously, in special heat-treatment processes

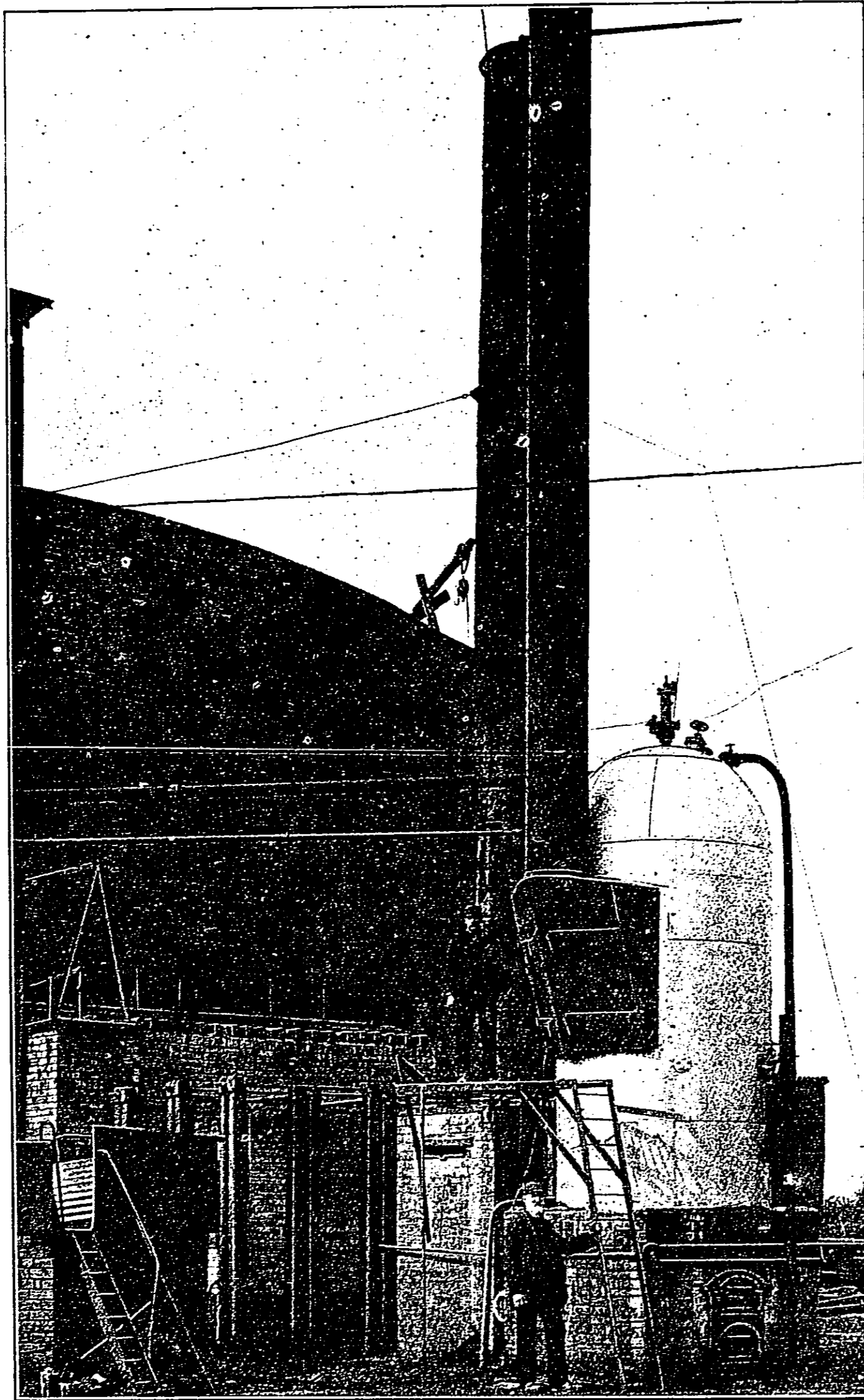


Fig. 35.—Boiler fitted with Cochran System, utilising the Waste Gases from a Reheating Furnace.

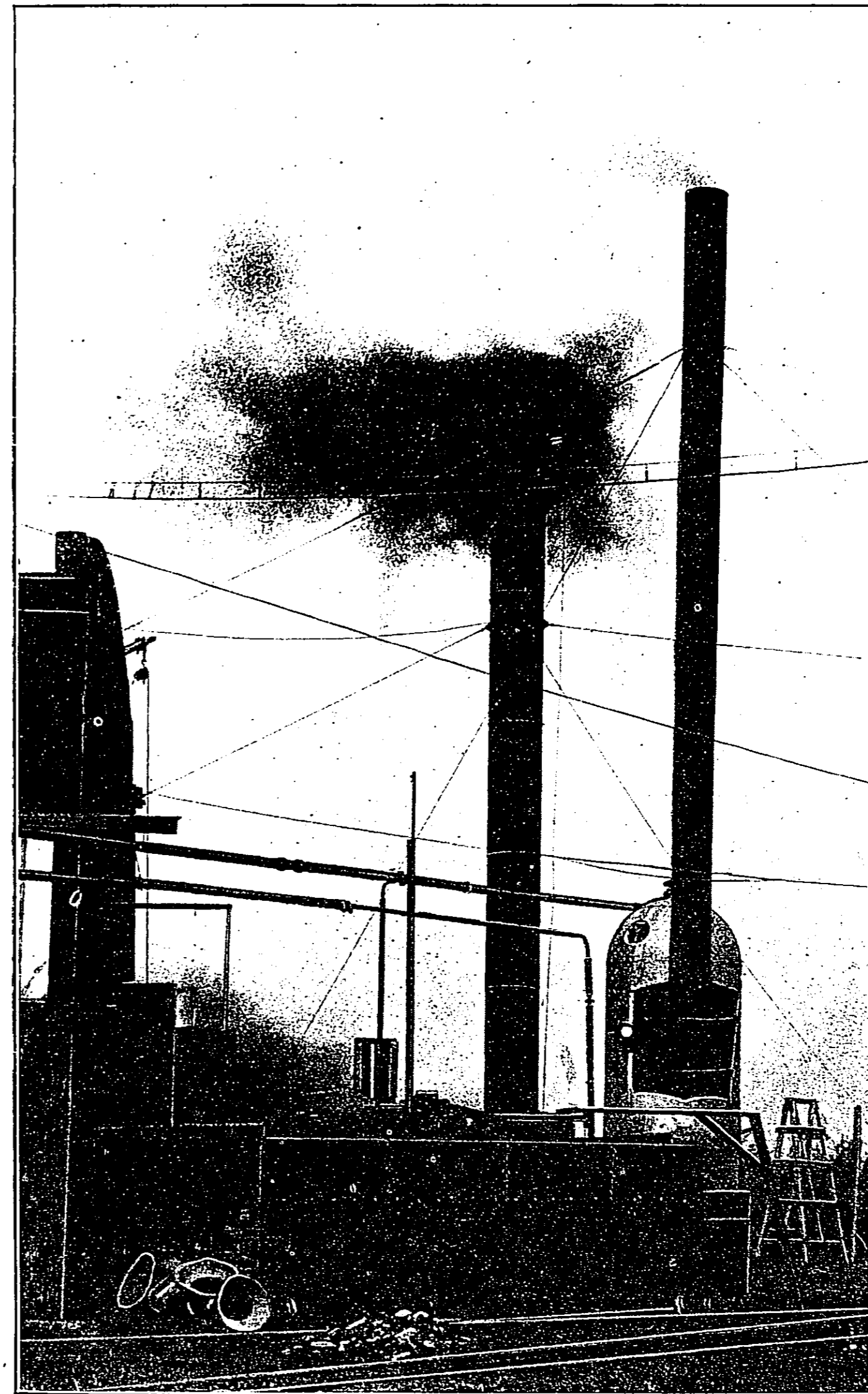


Fig. 36.—Cochran System—Left-hand Chimney when not used, and Right-hand Chimney when System is in operation.

smoke is absolutely necessary in the furnaces to prevent the spoiling or burning of the steel, but there is no necessity when the smoke leaves the furnaces to discharge

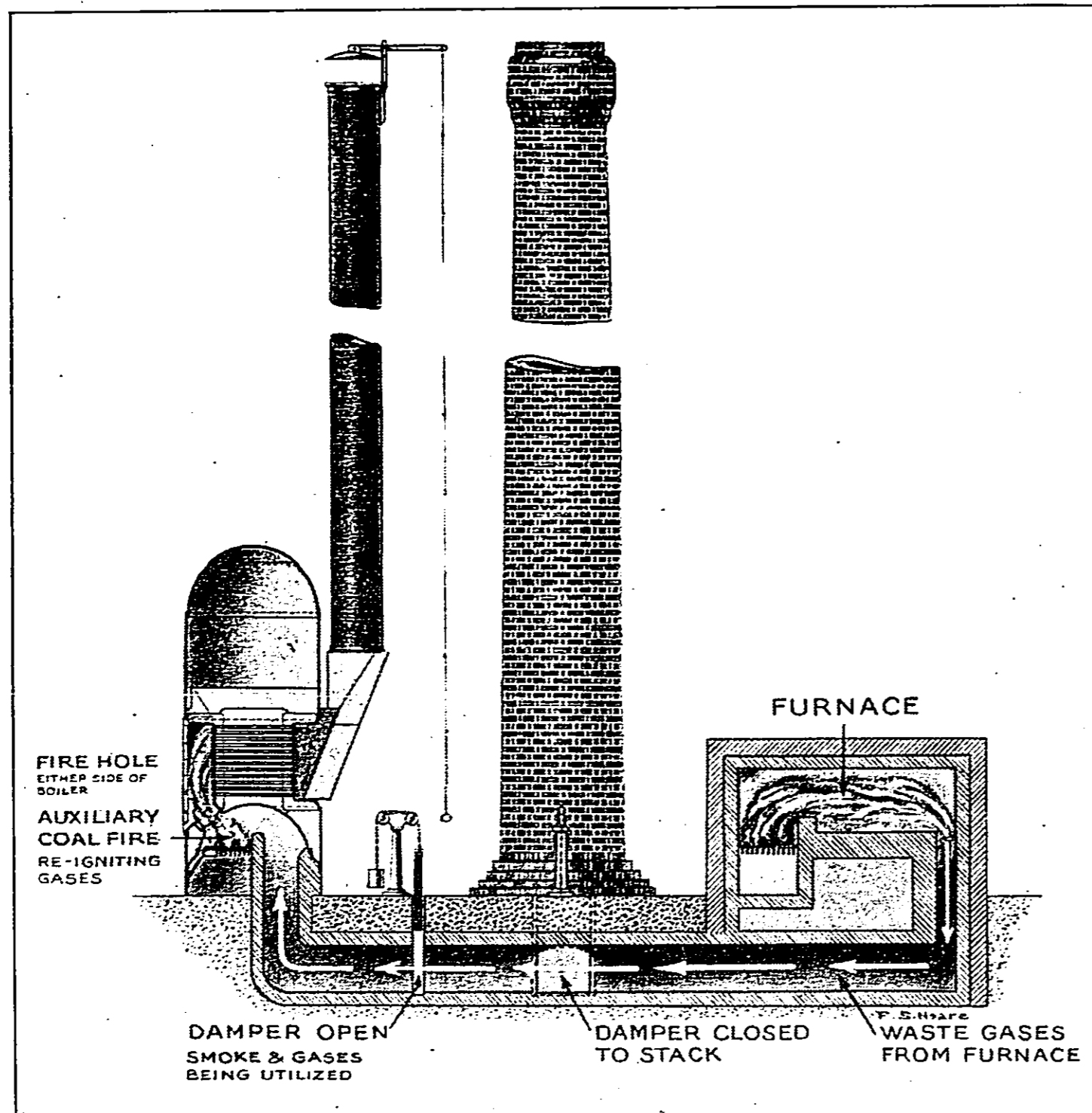


Fig. 37.—Cochran Improved Waste Gas System.

it into the atmosphere, for it can, as shown, be passed through waste heat boilers or furnaces and be utilised.

It is the duty of all who own furnaces to put down waste heat boilers or furnaces to utilise their waste heat, on the ground of economy, but even more so is it a duty in the interests of Public Health.

CHAPTER XIII.

PUBLIC HEALTH (SMOKE ABATEMENT) ACT, 1926.

Summary of the Act and Suggestions.

Section 1.

Sub-Sections (1) (a) and (b) Extension of meaning of smoke.

Under *Section 91* of the Public Health Act, 1875, any chimney (not being the chimney of a private dwelling-house) sending forth black smoke in such quantity as to be a nuisance is to be deemed a nuisance liable to be dealt with summarily under *Section 94* and later sections of that Act.

The limitation imported by the word "black," is removed so that proceedings may be taken even though the smoke is not black, if it is considered to constitute a nuisance.

The expression "smoke" for the purposes of *Sections 91, 92, and 102* of the Act, 1875, is also extended to include soot, ash, grit, and gritty particles.

Smoke of any colour, density, or duration which is not necessary, and can be practically prevented without interfering with the efficient working of the furnace will be a statutory nuisance, also all unnecessary soot, ash, grit and gritty particles.

The chimney of the private dwelling-house should be included in the Act.