It is well known that coals of a hydrous character are more susceptible to spontaneous ignition than those of a more anhydrous nature, and on this account the occurrence of fire in mines working brown coal is more frequent and usual than in the case of mines where bituminous or anthracite coals are worked. In consequence of fires a very considerable tonnage of coal has been irrecoverably lost. This is not to be wondered at in the case of many mines in the colony which have been laid out on a system (or, in many instances, a want of system) whereby efforts to localise the extent and effects of a fire can seldom be crowned with success. It must not be inferred that the management is to be entirely blamed for this, although a want of special knowledge and experience in the laying-out of underground workings in such a manner as to minimise the risk of damage by fire is frequently apparent. Owners of mines are frequently to blame for not seeking the advice of mining engineers who have had practical experience in this matter, and also for requiring a fairly large output long before it is possible to open out the mine sufficiently to warrant such an output being legitimately obtained. It is quite a common but altogether erroneous idea with persons whose knowledge of these things is limited, that a good output can be obtained, and profits made, almost as soon as the coal has been struck, and this very notion on the part of mine shareholders, combined with shortage of capital, has been responsible for the loss of very large areas of coal not only in this colony, but all over the world. If a colliery is to be worked successfully there must be some well-defined plan laid out for the general development of the field, and this applies equally to both large and small holdings. Our coalfields are a national asset, and every care ought to be exercised to prevent undue loss or waste. There is no doubt that the granting of leases in excess of reasonable and legitimate requirements to men who have neither the capital nor knowledge to work the areas to the best advantage has been productive of much loss of coal by fires and other causes. Such men seldom have any idea as to the sizes of pillars which should be left in the inward working to allow of safe and economical extraction from the boundary backwards, nor the means nor knowledge to keep such pillars in proper shape, the result being that pillars are often found to be only feet in width where they ought to be yards, or even fathoms. With such haphazard mining a "crush" or "creep" may be brought on, and a fire ensue. Under a want of system such as this—no provision having been made to effectively deal with such a contingency as fire—the closing of the mine and consequent loss of coal is almost inevitable.

The point I now wish to impress is, that where there is a natural tendency towards spontaneous ignition the plan to be adopted for working a mine should receive very careful and serious consideration, and some method ought to be devised by which fires can be localised and kept under control. The accompanying sketch-plan will help to illustrate my meaning; and although I do not claim that the method shown will answer all requirements—different conditions requiring different treatment—yet the general system (which may be modified to meet local conditions) is one which I think is worth adoption, and has been proved of undoubted value in some of the English coalfields which are peculiarly liable to fires, and where thick seams, lying at a high angle of inclination, are worked.

Reference to the plan will show that I have selected for example a seam of coal won by means of an incline from the outcrop of the coal itself. The practical mind will at once grasp the scheme and adapt it to other forms of entry. The relatively small number of collieries in the colony which are worked from vertical winding-shafts is really the reason why I have adopted the dip-incline system as an illustration; and in this connection I may remark that in some of the English colliery districts where fires are frequent and the seams fairly steep it is usual to sink the shafts as near the outcrop as is practicable, and drive inclines to the dip boundary, allowing the mine-water to follow up the incline as section after section of the coal is exhausted, and so fill up the worked-out ground.

The plan shows a main incline (preferably about the centre of the field) driven to the dip boundary. This forms the main haulage-road and intake airway, and would be advantageously worked by an endless rope. On each side of this is an airway for conveying the return air from the workings of the separate sides of the main incline. These are joined near the fan, an air-crossing spanning the main incline for this purpose. Levels are to be driven from the bottom of the incline to the boundary on each side, and no bords or other workings (except the necessary stentons) are to be cut until the levels have been extended to a distance equal to the length of three panels from the boundary. The rise headings (one of which is to form the jig from the intermediate levels) are then commenced, and the main levels continued to the boundary. The rise headings referred to are pushed forward with all speed, intermediate levels driven, and headings again driven a convenient distance to the rise, as shown on the sketch-plan. Thus the coal is cut into "panels," and bords are then driven from the inbye heading of No. 1 panel towards the boundary. When the upper bords have reached the boundary (or boundary barrier, if such be required) the work of taking out the pillars from the inbye end is commenced. This operation is followed on in order from the other bords in rotation, the resultant work being practically as shown in No. 1 panel on plan. The bords in No. 2 panel will be cut about the same time as the pillars from the corresponding parts of No. 1 panel are being extracted, but they are not to be driven through to the headings of No. 1 panel (see plan). A substantial barrier must be left solid for the time being between the inbye ends of the bords from No. 2 panel and the headings of No. 1 panel. This isolation of broken ground between one panel and another forms the crux of the whole system, the size of the barrier being determined by the thickness and dip of the coal and other local conditions. It will be seen from the plan that pillar-extraction has been commenced in No. 2 panel, and the barrier of coal left in.

I will now assume that fire occurs in the goaf of No. 1 panel after the pillars have been for the greater part extracted. This can at once be controlled by breaking down the stopping C and erecting stoppings at A and B. A quicker method would be to have doors fixed at A and B, which