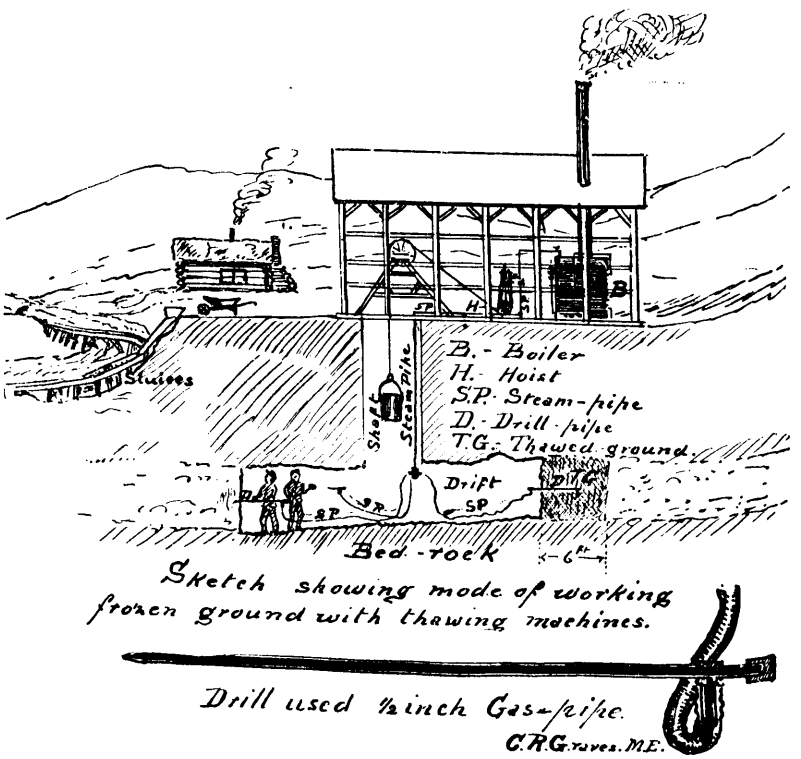
GOLD MINING IN THE KLONDIKE.

Great strides have been made in the past year in the methods of mining in the Klondike. When this country was first opened up, a completely new class of mining was gone into, namely, that of mining frozen ground. At first some of the enormously rich ground was found to be workable by the tedious but most na tural method of thawing out with fires. It soon became apparent that only a comparatively small number of the locations would pay to work by this means, and men commenced devising means to work more economically, and steam (as in most cases where economy of power and fuel is the object) came into vogue and has been given a thorough test this year and splendid results have been obtained. It was necessary, on occount of the cost and difficulty of transportation, that the apparatus used should be a take-down concern and as light as possible. It was also necessary, on account of the scarcity of wood and cost of turning the same into cordwood, that the greatest possible care should be taken to obtain the largest possible heating surface compatible with substantiality. The result of this has been a pipe-boiler, constructed with a dome above of heavy boiler plate, connected by a series of pipes with chambers below, these latter to enable the sediments to deposit and be cleaned out. Many classes of pipe-boilers have been taken in. Amongst these were the porcupine boiler, spiral pipe, and one made with two sets of horizontal and two sets of vertical pipes connected with two sets of heavy waterpipe chambers above and below. These have generally proved more or less failures, as the pipes clog up and when once choked become distorted and cause continual trouble. The best classes of boilers known up to date are such as we show in the accompanying illustration, and should be at least from 10 to 12 h. p., and have in connection a 4 to 5 h. p. hoisting engine. From these boilers a hose is led off to the workings, attached to which is a 6-ft. length of ordinary gas-pipe, half-inch has been found to be most suitable, which is beaten down to a round point at one end. The steel points have proved a complete failure. The other end is plugged with a solid steel cap for striking on; a couple of inches below this plug is inserted a T pipe to which the hose from the boiler is attached. The drill is used in the same way as an ordinary mining drill, namely, driven into the frozen ground with a hammer, and the steam passing through the small hole in the point is used to thaw out the ground. It is usual to drive about three feet. The steam will thaw out about three feet beyond this point in about five hours, making in all about four cubic yards of thawed dirt to every hole. This is then picked loose and shovelled into buckets and hoisted to the surface to be, in summer, passed to the boxes for cleaning, and in winter saved on the dump where it remains frozen up till the following summer. Where before this year only gravels from 25c. per pan, or $14.00 per cubic yard, yielded pay results, it is now found that, with these newer and more improved methods, gravel which yields 10c. per pan in deep ground, will pay well.

Of course these latter are not poor men's ground, as it requires considerable capital to install plant, and where formerly only two men could work seven work now. Nearly all the companies operating in the Klondike are now working the machines.

This years work has also had as a result the finding of pay streaks of many of the creeks, where no pay was found formerly, and many of the claims which could have been bought a year ago for a mere song are held now for from $5,000 to $50,000. In many cases what was supposed to be bedrock and the end of pay has been found to be only a false bedrock, superimposed on another bed of rich pay gravels, and in some cases there are more than one of these layers, so the life of the camp will be far greater than at first supposed by many years. It has been further demonstrated, beyond a doubt, that hydraulic working can be successfully carried on up there. This would to most seem an utter absurdity in ground frozen solid right down to bedrock, but is simple enough when fully explained. The ground has been frozen in layers; the bottom layer of a few feet having been frozen first, many ages ago; slide and other detritus were brought down from the hill sides on top of this and again frozen. In some cases many of these layers have been superimposed each one or most covered over with a growth of moss, which was a sufficient non-conductor of heat to prevent much thawing of the surface gravel till the next mass came down. Apparently the present surface has remained unaltered for many years. In the successive formation of these layers the creek bottoms have been shifted hither and thither and, in their cutting through, have concentrated the gold of the wash through which they passed into streaks, marking the creek beds in the bottoms, and here have been found the fabulously rich diggings of some of the best creeks. The general mass is also mostly rich, but does not yield as a rule, with ordinary methods, good pay; though there are exceptions where the benches are proving richer than the creeks.

The surface, where covered with moss, only thaws out for about 18 inches during the summer months, but when this is removed nearly 4 feet of ground becomes thoroughly thawed out very quickly, but until this is removed the action does not proceed further, or only to very slow degrees. Generally, facilities for dump from the benches above the actual creek claims are good, and there is in most places plenty of water for working hydraulic plants. It is not necessary to have the same force or volume as in the working of ordinary gravel deposits, as the mode of operation is only the removal and sluicing of the thawed surface, the action of the water helping the natural agencies in thawing to a very considerable extent. At first the water is turned on to the moss covered surface, and a large space cleared of vegetation, the first part being sufficiently thawed by the time this is accomplished to enable a large amount of gravel to be washed down to the sluices and from this on the ground is successively worked over from the top, leaving a continuously increasing surface exposed to the atmospheric action.



Sketch showing mode of working frozen ground with thawing machines.

Drill used ½ inch Gas-pipe.

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Mr. Alex. MacDonald formed a company in London to operate hydraulic plants, and last year installed a small one at the mouth of Skookum Creek, and has worked it this season with the result that the plant has paid its first cost and that of installing it, and all previous prospecting work, and left a small margin over. A very extensive plant was also taken in, and is now being installed, to be ready to operate next season. Very much of the ground which it is proposed to work by this means, will average from 15 cents to 25 cents per pan. Timber is plentiful and in most places water fairly abundant, and head easily procurable, where it is necessary to construct flumes. There is plenty of timber on the higher hills above the benches, and there is everywhere nearly all required grade for dumping the waste gravels. Taking