

ings, renewals, improvements, repairs, etc., \$6,000; Kamloops public buildings, \$11,600; Nelson public building, \$15,000; New Westminster public building reconstruction, \$17,000; Rossland public building, \$20,000; Vancouver drill hall, \$19,000; Williams Head, second district, &c., \$10,000.

Nova Scotia.—Digby post office custom house, &c., \$11,000; Halifax public building, \$25,000; Halifax quarantine station on Lawlor's Island, \$4,000; Springhill public buildings, \$10,000.

New Brunswick.—St. John Dominion public buildings, improvements, alterations, renewals, repairs, etc., \$7,000; St. John immigration building, \$11,000.

North-west Territories.—Court house, lock-up and police accommodation, \$7,000; Dominion public buildings, renewals, improvements, repairs, etc., \$4,000; Edmonton (Strathcona) immigrant building, \$1,500.

Manitoba.—Dominion public buildings, improvements, repairs, etc., \$5,000.

(To be continued next week.)

BLASTING.

To lower the cartridge by the fuse or wires is apt to loosen the cap, and thus an air cushion will be formed below it, reducing the power of the explosion. Carelessness in regard to this simple detail is one of the commonest causes of waste in the use of dynamite. The primer must never be compressed or rammed upon the charge. The "tamping" is now put in. Many writers advocate the use of sand or water with dynamite in holes inclining downwards. The most experienced blasters, however, state very positively that better results are always obtained by using the same clay tamping as is required with black powder. Tamping should be absolutely free from gritty particles. The best material is clay, damp enough to merely retain its form when compressed into a ball in the hand. Pellets of this should be dropped into the hole and very lightly compressed with a wooden rammer until about six inches of the hole above the charge has been filled. From this point to the top the tamping may be more firmly compressed, but not rammed.

CHARGING HOLES WITH BLACK POWDER.

After removing the sludge, dry the hole with a wisp of hay, or a rag, or cotton waste, fastened to the end of a rod. Now pour in the powder through a copper or tin funnel with a long stem, so that the powder will reach the bottom of the hole without touching its sides above the limit of the charge. If the hole is horizontal a long scoop may be used, filled with powder, which at the end of the hole is turned round to deposit the charge. For either horizontal holes, or those inclined

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upwards, the powder may be put into small paper bags and closely pressed into the end. For wet holes waterproof cartridges must be made, as explained in Chapter 11. The fuse is now put into place, and in the case of holes filled with powder in bags the last bag should have the fuse tied into it. Dry clay is now pressed over the charge, followed by the ordinary damp clay tamping, pressed firmly for three inches, after which it may be rammed by tapping the end of the tamping stick with a hammer. In holes one inch in diameter the charge will not blow out 7 inches of good tamping. With a diameter of two inches, 18 inches of tamping will not blow out. With a diameter of three inches, 20 inches of tamping will not blow out. These are the lowest limits admissible. An excess should always be given. The amount of the charge has nothing to do with it. The determining factor is the diameter of the hole. "Expansion tamping," so called, is employed with black powder when it is desired to cause its action to be retarded so as to split the rock along lines of weakness without shattering. It is consequently of value in quarrying. This consists in filling several inches of the hole above the charge with hay, straw, or tow, after which several inches of damp clay tamping are lightly compressed upon it, followed by firmly compressed tamping to the top. By "reaming" the holes so that a V notch is cut on each side the entire length of the hole, making the angles of all the V notches lie in a straight line,

as shown in Fig. 3, a perfectly homogeneous rock may be split with extreme accuracy in any direction, using expansion tamping. Very small charges, of one to three ounces, will do astonishingly effective work under such circumstances. This is the Knox system. The use of the "needle" or "pricker" is so undesirable that no description of it will be given. The "barrel," or tube, may be used where the hole is wet. A copper tube is slipped over a wire, and the two are inserted together into the hole; the tamping is compressed around the tube, and the wire is then withdrawn, being replaced by the fuse. The tube is recovered after the blast. For electric firing of black powder low power fulminating caps are employed. It is erroneously stated by many that the power of the black powder is increased by the use of the fulminating cap, i. e., that it is detonated. Under special conditions it is claimed that gunpowder can be detonated, but it is even questionable whether true detonation is accomplished when the gunpowder has absorbed some nitroglycerine, though apparently in the Judson powder this result is reached. Consequently there is no advantage in the use of strong detonators with common black powder.

(Continued next week.)

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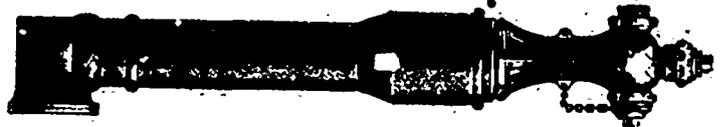
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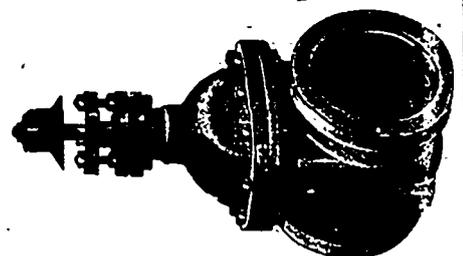
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