

(1) Star (Rathbun).		6 Sand (Jubilee brand).	
		4 months, 340 lbs.	
Neat.	1 wk. 2 wks.	1 wk.	2 wks.
(1 to 6) to 1..	213 230 pressed.	..	1350 pressed.
(1 to 6) to 1..	242 292 rammed.	..	2112 rammed.
(1 to 6) to 2..	184 215 "	1225	.. "
	0.3% residue on No. 100 sieve.		
	1.3% " " "	120	" "

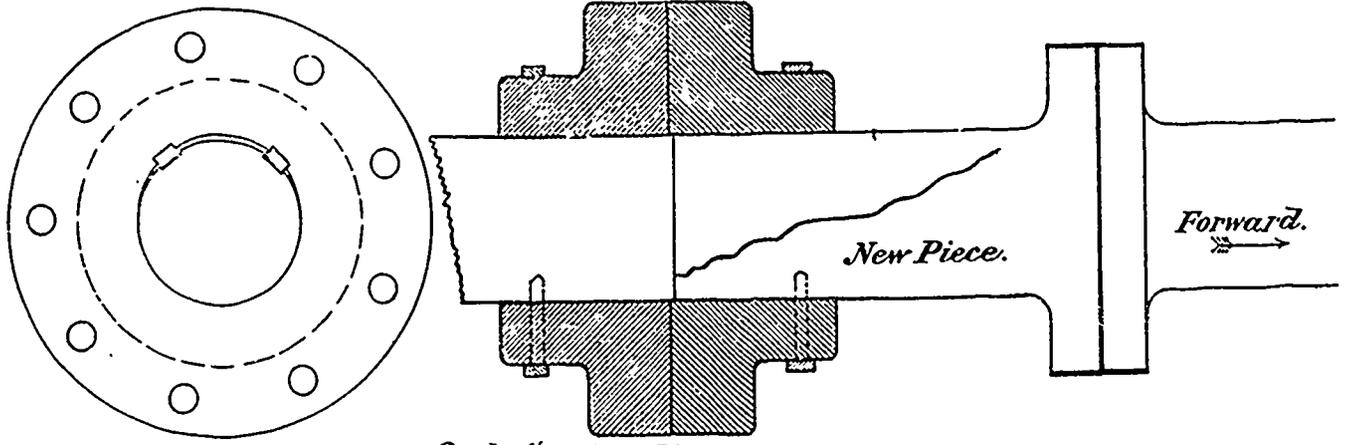
(1) Star (Rathbun).		1 Sand (Citadel brand).	
Tension.		Compression.	
Neat.	1 wk. 4 wks.	1 wk.	4 wks.
(1 to 1).....	332 475	1800 (1)	3837 "
(1 to 1) to 3..	135 141 rammed	470	687 rammed.
	0.2% residue on 100 sieve.		
	0.5% " " "	120	" "

REPAIRS TO S. S. MONARCH.

The accompanying sketch illustrates the method devised by Wm. Golding, consulting engineer to Lloyds Surveyors, at the port of New Orleans, L. A., for repairing the fractured shaft of the steamship Monarch, which vessel cleared from that port on the 25th of November last, for Liverpool, carrying one of the largest cargoes ever taken from an American port, consisting of 22,535 bales of cotton 60,000 bushels of grain, 11,200 sacks of meal; 29,068 staves and 242 head of cattle. Soon after sailing, a fracture developed in one of the 8 sections of the tunnel shaft, necessitating the return of the vessel to New

in possession of a rough knife for scratching minerals, a pocket compass and a small magnifying glass:—

Sampling—1. "Mixing cloth," or smooth waterproof sheet, 4 feet square. 2. Brush, broad (varnishing brush). Panning—3. Gold-pan, Russia iron (not to be used with quicksilver) 4. Iron mortar, 5 in. by 6 in., and pestle. 5. Sieve, brass wire, 40 mesh, in tin dish with cover. Pan-Amalgamation.—6. Two gold pans, one ordinary iron, the other graniteware. 7. Nitric acid, strong, in 2 oz. glass-stoppered bottle. 8. Mercury, 1 lb. in bottle. 9. Sodium, 1/2 oz. in bottle, with naphtha. 10. Hand-scale, "Traveler's letter and parcel balance," weighing 1/4 oz. to 12 ozs., for weighing mercury and pulp. 11. Balance, hand scale with sliding weight on beam, very sensitive, from 0.1 to 5 grains, for weighing beads of bullion and weighing out charges for quantitative blow-pipe assay. 12. Mercury retort, small, Russia sheet-iron 1 1/2 x 1 1/4 inches, or small cast iron retort, with cover and pipe to collect mercury. Also sheet of Russia iron 8 inches square (with hole for supporting the Russia iron retort in the centre) for quartering when sampling. 13. Porcelain dish, and porcelain thimble, small, for parting in. 14. Graniteware cup and saucer, small size. 15. Brass wire sieve, 60 mesh. 16. Wooden pestle. 17. Sheet lead, pure, 2 ozs. 18. Sheet silver, pure, 1/2 oz. 19. Borax glass, ground, 1 oz., in deep round tin box. 20. Soda, 1 oz., in deep round tin box. 21. Litharge, 4 ozs., in deep round tin box. 22. Bone-ash, 2 ozs., in deep round tin box. 23. Paraffine lamp, tin, with 1/2 lb. paraffine. 24. Blow-pipe. 25. Two clay pipes, one mounted for cupelling, the other for heating mercury. 26. Charcoal, 3 pieces, sawn square. 27. Pincers for small buttons. 28. Steel anvil, 1/4 x 1 1/2 x 2



Scale 1/16 Full Size.

Orleans, where she arrived without assistance on the 30th of November, 1897. To renew and remove the shaft would require several weeks' time, necessitating the removal of a large portion of the large cargo. It was therefore decided in the interest of all concerned, to repair the shaft in place, and make the renewal at port of destination.

As shown in the sketch, the shaft was cut off in place, while the vessel lay at anchor in the river, the new piece was forged, turned and fitted; the large coupling cast, bored and turned, and the entire work completed in less than 12 days after the vessel's return; the success of the undertaking is attested by the arrival of the vessel in due time, at port of destination. The value of vessel and cargo was estimated to be \$1,250,000.00

PROSPECTOR'S OUTFIT.

Editor CANADIAN ENGINEER:

A friend of mine who intends to go prospecting before long through the Omenica district, asks if it would be advisable to take an inexpensive outfit for testing ores, with a suitable textbook on same. He knows nothing whatever of analysis or assaying. Will you kindly give me your opinion on the matter, and if you think it would be judicious for him to take an outfit such as mentioned above, what would it need to consist of and what work on the matter would you recommend as the most suitable, that is to say, the simplest and most practical? By giving information asked for you will greatly oblige

Yours truly,
SUBSCRIBER.

British Columbia Southern Railway,
Wardnor, B.C., 5th April, 1898.

[ED.—We would advise your friend to secure a copy of either "Gold and Silver Ores," by W. Hamilton Merritt, or "Pocket Mining Manual," by J. H. Chewett, both of which will be found in the book list on page III. of this paper. The following is a list of articles required for field work, it being taken for granted that the prospector is already

inches. 29. Small piece thin asbestos card. 30. Hammer, small. 31. Magnet. 32. Smooth-headed bolt, for making cupels in clay pipe. This outfit will determine the value of free milling ores as low as of any economic value. It will enable the proportionate yield in concentrates to be qualitatively tested as to their precious metal contents. Quantitative determination of concentrates outfit. 33. Plattner's ivory button scale. 34. Clay crucibles, 1 doz. 35. Clay capsules, 2 doz. 36. Fletcher's blow-pipe furnace with side hole. 37. Camel-hair brush. 38. Flour, 1/4 oz (?) in tin box. 39. Methylated spirits, 1/4 pint. 40. Common salt, fine, 1/2 oz., in tin box. 41. Nitre, 1/2 oz., in tin box. 42. Spirit lamp, tin. With the above mentioned outfit free-milling ores can be tested, and value determined as low as \$1.50 per ton for gold ores, and much lower for silver ores, if desired. Also the value of the concentrates, or of melting silver ores, can be approximately estimated. The weight of the outfit is about 20 lbs.]

CO-OPERATIVE SETTLEMENT.

Editor CANADIAN ENGINEER:

SIR,—The prospect of early work on the Georgian Bay and Ottawa Ship Canal, together with the agitation for a railway to James' Bay, give point to a suggestion I made regarding a co-operative settlement by men of intelligence and some financial means. I know a point where these enterprises must intersect, if the shortest route, with the best land adjacent, are considered important. The shore of the Georgian Bay is rockbound round the north, and admission must be sought where a bay or navigable river penetrates the coast range of granite or Huronian mountains. Spanish River, Parry Sound, Cutler and Thessalon, are examples of such entrances; while French River, White Fish, Blind and Mississagrea Rivers are barred by falls at their mouths. Now a navigable bay, penetrating to the arable land, and accessible in all weathers, is a very desirable point from which to start a colonization road. If, in addition, unlimited water power, cheaply controlled, be added, with a choice of routes through good country for