

**METHOD AND COST OF CLEARING CUT-OVER LAND WITH POWDER**

(Continued from page 38)

by using the pole. Hanging fragments were removed occasionally with a second blast, but generally by means of the team and single block and cable. Occasionally two double blocks and a 7/8-in. wire cable were also brought into action, the single block being attached to the running end of the large cable from the double blocks. This arrangement proved to be very efficient, multiplying the power of the team approximately six times.

At first a few piles were made around large shattered stumps in the hope of removing them by means of fire, but this was found to be expensive and unsatisfactory, as the piles were consumed long before the stumps were burned out, and much labor and trouble were necessary in keeping the fires going till the stumps were consumed. In burning, it was found best to fire first a pile of stumps and logs here and there. This gave abundant live coals for readily kindling the remaining piles and proved a great saving of time. One man with a long-handled shovel could quickly have all the rest burning. As the piles burned out it was necessary to throw the material from the outer edges into the centre, until all was consumed and the ground thus left ready for leveling.

The cost of piling the stumps was as follows:

	Plot No. 1		Plot No. 2		Total
	Hours.	Rate.	Hours.	Rate.	
Swampers ..	168	\$0.25	220	\$0.25	\$55.00
Teamsters ...	42	.25	52	.25	13.00
Teams .....	42	1.00*	52	1.00*	5.80
Feed .....	..	1.00*	..	1.00*	5.80
<b>Total .....</b>		<b>\$61.80.</b>			<b>\$79.60</b>
<b>Per acre .....</b>		<b>12.35</b>			<b>15.92</b>

\*Per day.

**Leveling.**

The larger holes were all filled by turning one or two deep furrows into them; then the balance of the field was plowed, and a large V-shaped road drag made of 3 by 12-in. planks was used for further leveling. This drag was equipped with a heavy ring on each leg at the rear and when alongside a large hole an extra team was hitched to this ring with a cable and the drag pulled sidewise, thus depositing the load of earth in the hole. This operation may be repeated from two or more sides if necessary. A metal plate fastened to the bottom of the drag and extending outward from 2 to 3 ins. will increase its efficiency. This method was found to be cheap and very efficient.

The estimated cost of leveling the ground per plot was as follows:

	Hours	Rate	Total
Teamsters .....	20	\$0.25	\$ 5.00
Helpers .....	20	.25	5.00
Teams .....	20	1.00*	2.00
Feed .....	..	1.00*	2.00
<b>Total .....</b>			<b>\$14.00</b>
<b>Per acre .....</b>			<b>2.80</b>

\*Per day.

The estimated cost of burning per plot was: One man 80 hours at 25 cts. or \$20, making the cost per acre \$4. The average amount of powder used for each size of stump is shown in Table I.

General figures on the clearing of the two plots follow:

	Plot No. 1	Plot No. 2
Area, acres .....	5	5
Number of stumps .....	479	365
Total feet diameter .....	703.3	674.7
Average diameter, ins. ....	14.4	21.2
Powder used, lbs. ....	1,678	2,000
Cost powder, cts. per lb. ....	16	17
Cost powder per ft. diam., cts. ..	39.3	50
Blasting holes, ft. ....	1,220	1,228
Cost blasting per ft. hole, cts. ...	.032	.034
Blasting caps, No. 5, No. ....	297	6
Electric fuses, No. 6, No. ....	340	595
Triple tape fuse, ft. ....	422	9

The final cost figures were as follows:

	Total cost		Per acre		Perft. diam.	
	Plot No. 1	Plot No. 2	Plot No. 1	Plot No. 2	Plot No. 1	Plot No. 2
Prelim. work	\$72.65	\$73.70	\$14.53	\$14.74	10.3	10.4
Making holes	38.90	42.00	7.78	8.40	5.5	6.2
Blasting ...	34.70	31.35	6.94	6.27	4.8	4.6
Powder ....	276.50	340.00	55.30	68.00	39.2	50.4
Caps .....	24.77	38.73	4.95	7.74	3.5	5.7
Fuse .....	4.22	0.09	0.84	0.02	0.6	0.0
Piling stumps	61.80	73.80	12.36	14.76	8.8	10.8
Burning ...	20.00	20.00	4.00	4.00	2.8	3.0
Leveling ...	14.00	14.00	2.80	2.80	2.0	2.1
<b>Total ....</b>	<b>\$547.54</b>	<b>\$633.67</b>	<b>\$109.50</b>	<b>\$126.73</b>	<b>77.5</b>	<b>93.7</b>

**OXY-ACETYLENE AND ELECTRIC WELDING AND CUTTING PROCESSES IN LOCOMOTIVE SHOPS**

(Continued from page 28)

punched by a countersunk die which gives the proper bevel for welding.

A great deal of trouble was experienced in welding in the superheater flues and tubes when it was first started, but after a little experience much better success was arrived at. Some operators prefer the tubes belled, and others prefer them beaded; some prefer the water in the boiler and others do not. The operators I am connected with like the belled methods best and with the water in the boiler. This keeps the tube sheet from heating, especially round the smaller tubes. Tubes are set in with copper ferrules set back 1/32 in. and the flues are belled out 3/16 in. to 7/32 in. and the small tubes 3/16 in. The sheet is roughened all round the tubes and flues, and the oil is then burnt off with the oxy-acetylene flame and tubes, and flues welded in with electrode, using 1/8 in. mild steel or Swedish iron; the latter is preferred if caulking is needed.

For cutting steel and wrought iron, the oxy-acetylene process has practically no competitor, it being impossible with the carbon point to cut as fast, or as fine and neatly, as the gas torch, although for scrapping fireboxes and frames, the carbon point is cheaper, if time is no object and labor cheap.

A new wood, called balsa, growing principally in South and Central America, is remarkable on account of its lightness, microscopical structure, absence of woody fibre, elasticity and heat insulating qualities. So far as investigation has disclosed, it is the lightest commercially useful wood known. It has also considerable structural strength, which makes it suitable for many uses.