

Removing Stumps at Moderate Cost

J. L. Ashlock, of the Washington State College, Gives Much Valuable Information.

WHAT is the poor man's way of removing stumps? In the Pacific Coast states, in the states flanking and including the Rocky mountains, from the Lakés to the Gulf, and from Maine to Florida, there are people who want to know.

And yet, since men commenced the practice of felling whole forests wherever it was convenient to do so and the law did not forbid, numerous ways have been devised for getting rid of stumps. Horses, oxen and mules have been used to drag them out of the ground. Engines have been similarly used, either uprooting the stumps by direct pull, or operating lifting cranes. Blasting powder has been employed to split and loosen them in order that they may be lifted or dragged out.

But none of these methods do for the poor man; and generally it is the poor man who seeks the stump-bound frontier for the purpose of making a home. Because he is poor, to do his work he must at first resort to primitive means. These in the case of logged-off land to be cleared are his bare hands, fire and his ax.

An ax of some sort, though but a club weighted at one end with a wedge-shaped stone, has been obtainable by men in all known ages. Fire is for the free use of every man who can find fuel, which is generally plentiful in forest clearings. Hands are a part of man himself, hence are his nearest and most dependable means of doing things.

So these three resources are within reach of every able-bodied man, rich or poor; and the question is, "Can any man in the single lifetime that is his remove stumps from enough acres of land to make a good-sized farm?"

Results of Investigation.

Investigations that have recently been made in the logged-off districts of Washington and Oregon promise a way of removing stumps which is within reach of every man, rich or poor. Indeed, the method is more than a promise, and has passed the experimental stage; for bulletins are now in possession which in the immediate future will be sent far and wide throughout stumps, explaining how, by a simple process of burning, the roots of a big stump can be turned into charcoal. That finishes the stump so far as its obstruction to farming is concerned.

In the idea of charcoal-burning there is nothing new. For many centuries the production of charcoal has been understood and practiced among both civilized and uncivilized people. In Sweden it is made from rectangular piles of wood, the process being regulated by the careful admission of air through holes in the coverings over the wood. In China charcoal is prepared in pits, preferably in clay soils. In most countries where wood is abundant, charcoal-burning is carried on by firing conical piles of billets of wood from a central hole or chimney.

Charcoal is used as a fuel, and as a reducing agent in metallurgy. It is used in the manufacture of filters, and may be administered as a medicine in some cases of dyspepsia. On account of the resistance of charcoal to the action of water, stakes for wet soils and the inside of casks are charred previous to use. Chickens eat charcoal and most poultrymen know its value for maintaining the health of their birds.

So charcoal is a well known product, having value for many different purposes and the methods of its production are well known, and have been known for many centuries. But in all that time the fact that charcoal-burning could be used to destroy stumps as big as they grow, was overlooked.

Underground Fires.

Manifold are the illustrations which many of us have seen, indicating plainly that fire will burn under the ground if properly controlled. Engineers have often observed that logs which have been laid down in swampy land for the first bed of a railroad will burn under the grade when the protruding ends dry out sufficiently to catch fire in dry seasons. In Alaska, old logs which are imbedded in the frozen gravel are burned by building a little fire against the exposed end of the log and regulating the burning so that as it proceeds the froz-

en gravel will thaw and fall down, thus keeping the fire lightly covered all the while. In burnt-over clearings it is a common sight to see here and there a stump which for some reason had burned down into the ground.

Each of the cases cited is an example of fire working precisely in the way it works when burning underground in the roots of a big stump.

Twenty years ago a settler in the western part of Oregon allowed a considerable amount of litter to collect in a pile near his barn, which, during a dry season, caught fire and burned. The man noticed that where the litter had been piled around an old stump the fire continued to burn for several weeks. His curiosity was aroused, and upon investigating he discovered that the stump had been transformed into a bed of charcoal. The largest roots had been consumed in this way several feet underground.

However, much of the force of this lesson was lost for the time being. Men in that neighborhood who saw what had occurred later attempted to fire stumps by heaping straw, brush and other inflammable material over them, and their endeavors failed quite naturally, since charcoal-burning is not effected by an open flame.

Taught by a Sea Captain.

Fortunately a man heard of the occurrence who knew something of the behavior of fire when burning underground. He was an old sea captain, E. C. Cruse by name, and is now living near Castle Rock, Washington. Cruse, after a great deal of experimenting, succeeded in firing stumps. He taught Harry Yount, of Woodland, Washington, how to do it. Others learned the trick, so that two years ago there were in northwestern Oregon and western Washington perhaps a dozen men who knew fairly well how to kindle a fire which would burn a stump root and base.

A singular fact is that up to the very recent development of the method, not enough interest could be aroused to induce neighbors of the few successful men to learn the process and use it in their own clearings. This lack of interest was certainly not due to any lack of stumps.

In the summer of 1909 H. W. Sparks, who had just been elected supervisor of demonstration farms of the State College of Washington, was on a tour through the timbered counties of western Washington, and while in Woodland saw Harry Yount burning stumps. Sparks like many other men, had always believed that fire is the natural means with which to destroy stumps. But he had never been able to kindle a fire so that it would destroy a stump root and all. Many times he had seen a fire follow a piece of timber far underground, but it had never occurred to him that such timber could as well be, so far as the fire was concerned, the biggest root of a stump. But the idea dawned upon him with force when he saw what Harry Yount was doing.

Legislative Appropriations.

The eleventh session of the Washington legislature met during the winter of 1909, but instead of appropriating funds to the state agricultural experiment station (which is an arm of the State College of Washington), for the purpose of investigating the logged-off land problem, passed Senate Bill 146, which authorized the U. S. Bureau of Plant Industry to spend as much as \$5,000 for this purpose from funds of the State of Washington, imposing the condition that the Bureau should duplicate the amount thus expended by expenditures from its own congressional appropriations. The twelfth session convened during the winter of 1911 and failed to make any appropriation whatever for logged-off lands. The indifference thus exhibited probably proceeds from the same streak of human nature which Yount and Cruse and others had contended with when they sought to induce their neighbors to come and be shown how to rid their land of stumps by a poor man's method.

However, in one way or another, part of the time by working in co-operation with the U. S. Bureau of Plant Industry, and part of the time making spe-

cial provisions, the State College has for the past two years kept Sparks pretty steadily at work among the stumps.

Sparks commenced his investigations on the theory that the process he had seen succeed in the Yount clearings at Woodland, was approximately correct for the particular soil and climatic conditions of that locality. He therefore learned thoroughly the method used by the Woodland people, expecting to introduce it into other regions with such variations as the changed conditions should justify.

Method of Burning.

Here is the way they did it in the Yount clearings:

Chop the bark from the lower part of the stump. Take some dry wood broken in 18-inch lengths or nearly so, and stand the pieces around the stump, placing the finer and more combustible sticks underneath. On the windward side of the stump, leave a place for an opening in the covering over the wood, by placing against the pile two pieces of bark or wood with the upper ends meeting and the lower ends about 12 inches apart on the ground. In the triangle thus formed, pile fine chips and shavings for kindling—a little pitch is good. Arrange it so that the pitchy kindling leads into the interior of the pile. This will secure a quick start when the fire is lighted.

Having arranged the wood as indicated, take some soil (that containing a good percentage of clay is preferable) and cover the pile clear around the stump with the exception of the triangular space where the fire is to be started. Lay each shovelful very carefully against the wood, placing the first bottom tier around the stump quite loosely. Do not permit the earth to sift down into the wood and shavings. Put the upper tiers of shovelfuls on very compactly. The "collar" around the stump should be made especially tight.

Light the fire in the triangular opening already described. If the directions just given have been carefully followed, the fire will burn into the pile, at first consuming the chips and kindling under the larger sticks, then spreading to all the wood around the stump. When the fire is burning clear around, and smoke is issuing from the pile, close the triangular opening with loose earth. As the fire continues to burn slowly, the pile settles evenly all the way around. Where breaks occur in the covering, close them with more earth. When the smoke issuing from the cover is blue, too much air is reaching the fire, and the charcoal is being consumed, which is undesirable, so put on more cover. When the smoke is white and steamy, moving upward in a sluggish way, charcoal is being made of the stump, which is the desired thing.

From this point on, the fire, if properly controlled, will work into the base of the stump. Where a big root is encountered, the fire will first burn straight through it, and, upon striking the soil on the opposite side, follows down the under side of the root, gradually working to the upper part which it finally reaches. In this slow way the base of the stump and the big roots for several feet underground will be turned into charcoal.

When the base of the stump is entirely consumed, the upper part falls over. The break in the covering thus made is lightly covered with earth. Burning will continue in the roots until they are pretty well destroyed. Then if it is desired to consume the charcoal, the cover is opened, and total combustion is speedy and complete. The soil next to the stump and the roots is not injured by the fire, except a small spot just under the crown of the stump where the excessive heat sometimes causes the forming of a "clinker."

(To be continued.)

The New York state forest nurseries have a capacity of 28 million young trees a year.

June Forecast

THE month of June will no doubt be a very eventful one. On the first Huerta will eliminate himself long enough to take another drink. Villa will take time to shoot a few hundred federals, while on the fifth Teddy will relegate all the disbelievers of his river story to the Ananias Club. The moon will be full on the seventh and Huerta will be full on the eighth. The balloon ascension at Portland will take place on the eleventh. Congress will adjourn on the thirtieth and go in search of the Monroe Doctrine and votes for re-election.

June this year, according to all signs, will be warmer than January. There will be considerable rain if it stays cloudy. During this month the colleges will turn out graduates resembling mushrooms, who will go forth and teach the younger generation how to tango and smoke cigarettes properly.

Yea, verily, the month of June will be eventful.

The Sunday schools hold picnics out in the leafy wood, the children stuff their systems with everything that's good, the minister gets mushy with the leaders of the choir, until the yaller jackets puncture his sacred tire. The teacher of the infant class gets daubed with deviled egg, while a horrid, hungry wood-tick burrows in her tender limb. In June the rose is flinging all its fragrance on the air; the turtle doves are cooing and a-wooing everywhere. The maiden haunts the hammock, while her lover lingers nigh, while her mother from the window watches with suspicious eye, the summer girl is wearing her most transparent dress, and as to her anatomy, one doesn't have to guess. The hens take a vacation and desist from laying eggs, and the girls who go a-swimming, all strive to show their skill. The lightning bugs and army worm, the currant slugs and such, have seized the vegetables and hold them in their clutch. The ants are in the cupboard, and they revel in the jam, while the roaches cock their noses up and don't seem to care a cent.

In June life is one glad sweet song for the farmer boy. He arises from his downy couch when the first faint streaks of dawn appears in the east. He goes out and bears the morning stars singing together. He wakes up the rooster perched on the plow handle and makes him salute the flag. Then he whistles the Merry Widow waltz as he hustles to the barn to curry the mules and anoint their sore shoulders with ax'e grease. His soul is full of sunshine when he remembers that John D. Rockefeller, Woodrow Wilson and Ty Cobb were the sons of the knighted farmer and danced the tango behind a wooden harrow and stubbed their toes on last year's corn stalks when they were boys on the farm.

By June 30th we expect Hi Gill's broken bones are to be mended enough to allow him to issue a proclamation on the latest and correct way to tango and also calling on the Loyal Sons of the Great Tye to attend the Potlatch, but poor Oregon is bound to suffer while Gov. West and the state militia go to California to close up Mt. Lassen which is on another rampage.

Yea, verily, the month of June will be eventful.

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