H. J. HABER.

METHOD AND MACHINE FOR PREPARING CHARCOAL.

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1,243,734. Patented Oct. 23, 1917.

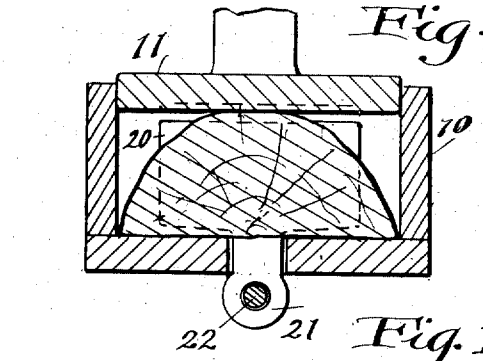


Fig. 3

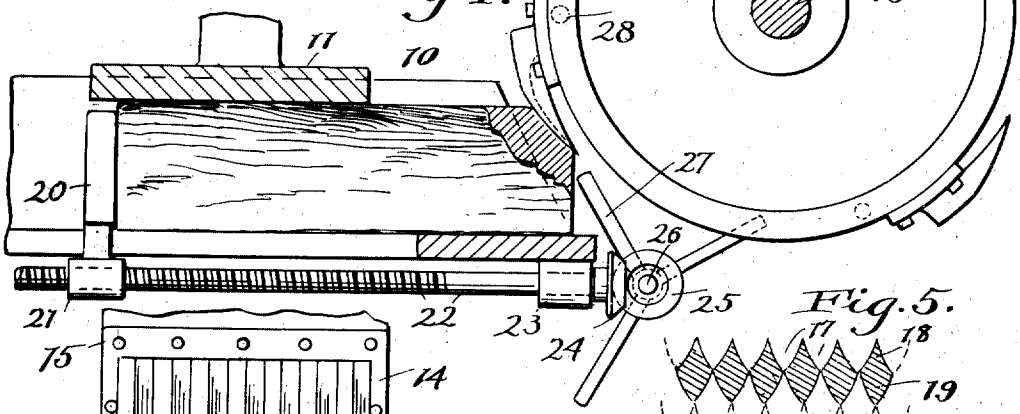


Fig. 1.

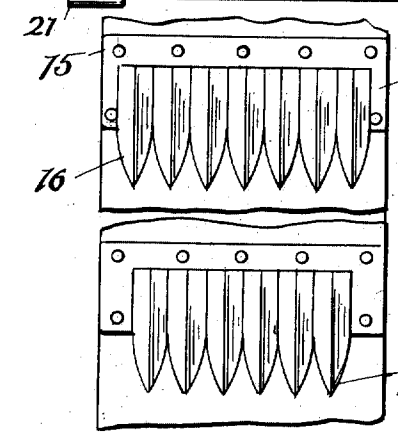


Fig. 2.

Fig. 5.



Fig. 4.



Fig. 7.

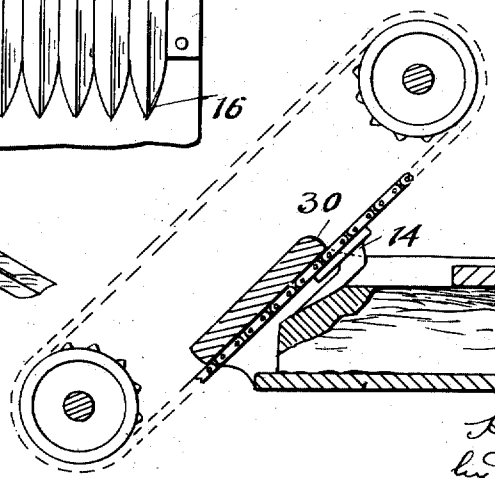


Fig. 6.

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UNITED STATES PATENT OFFICE.

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METHOD AND MACHINE FOR PREPARING CHARCOAL.

1,243,734. Specification of Letters Patent. Patented Oct. 23, 1917.

Application filed February 19, 1917. Serial No. 149,447.

To all whom it may concern:

Be it known that I, HENRY J. HABER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Methods and Machines for Preparing Charcoal, of which the following is a full, clear, and exact description.

This invention relates to a method of preparing wooden pieces or strips which are particularly intended to be charred for the purpose of making charcoal, and also relates to a machine by which the wood pieces may be prepared.

At the present time it is customary in the matter of preparing charcoal, to heat in a closed retort a body of wood such as a log or large piece and after the wood is charred to grind the large lump of charred wood thus produced in suitable machines; this grinding will produce charcoal pieces of various sizes and will also produce a great deal of dust which is practically a waste product.

In the last few years there has grown up a great demand for charcoal pieces of a certain size, these pieces being quite small and used largely in heat treatment of steel, the charcoal being used in connection with other chemical substances to pack the steel article in a retort in which it is to be treated.

The fact that in grinding charred wood there is no certainty of producing any given percentage of charred pieces of the desired size, and the fact that the desired size seems to be rather difficult to produce in large quantities under present methods, has caused charcoal of this particular size, which is a well recognized size in the trade, to become extremely high in price.

It is the main purpose and object of this invention to provide a method by which wood in its green state is formed in pieces or strips which after charring may readily be ground or broken into pieces of the size which is desirable. A further object is to produce a machine which will produce pieces of wood in the green state which when charred will give charcoal pieces of the desired size.

Generally speaking, the invention may be said to comprise the elements and combinations thereof set forth in the accompanying claims.

Reference should be had to the accompanying drawings forming a part of this specification, in which Figure 1 represents in elevation with portions in section the principal elements of a machine for performing the desired function; Fig. 2 is a plan view of gangs of sets of gouges used upon the machine; Fig. 3 is a transverse section of the trough or guideway in which a log or the piece of wood will be guided and fed to the gouges; Fig. 4 is a cross section of a gouge; Fig. 5 is a diagrammatic view which is intended to show the positions in which the sets of gouges will successively act; Fig. 6 is an elevation with portions in section of another form of machine; Fig. 7 shows in perspective approximately the form in which the pieces or strips of wood are cut from the larger mass of wood.

In carrying out my method for the production of charcoal, I prepare green wood into certain strips or small pieces, these strips or pieces I prefer to form by causing a somewhat hollow gouge to traverse a piece of wood in a direction which cuts the grain of the wood at an angle. The angle at which the gouge cuts the grain of the wood may be varied somewhat but I have obtained good results when cutting the wood at an angle of approximately 45° with respect to the grain of the wood. This then produces a strip or piece in which the grain of the strip runs approximately at right angles to the axis of the strip so that if the strip be severed or broken it will break off into a number of smaller pieces, the faces of which pieces are approximately parallel.

These strips or pieces are then charred in the same manner as at present is the practice, and after they are charred they are broken up in any suitable machine. This breaking-up process is very simple because of the grain of the pieces, and furthermore this particular form of strip when charred and broken up will produce substantially no charcoal dust, so that all the pieces obtained by the treatment will be of some size which is commercially usable.

The form of the pieces which may be broken from such a strip as that shown in Fig. 7, will approximate a diamond shape in cross section except that of course two of the adjacent sides will be slightly concave while the other two adjacent sides will be convex. This shape lends itself very nicely in the matter of packing steel articles or

pieces for heat treatment inasmuch as the angular outline of the pieces enables them to fit closely around the shaft or steel article being prepared.

In Fig. 1 there is shown the elements of a machine which may be used in preparing green wood for the charring process. This machine comprises a trough-like member 10 which is adapted to receive a half a log or piece of wood of any shape which is suitable for the purpose. Above the trough and suitably held to bear upon the log within the trough is a presser member 11 which holds the log steady under the action of the gouges which will be later explained. Adjacent the forward end of the trough 10 is a wheel-like member 12. This member is mounted upon a suitable shaft 13 which shaft will be supported in suitable bearings which are not shown. The wheel-like member 12 might perhaps be more aptly described as a drum as it is of sufficient width to accommodate a gang or unit of gouges such as indicated at 14. The gang of gouges comprises a base portion 15 upon which are mounted a series of individual gouges 16. Each of the gouges in cross section approximates the form shown in Fig. 4.

There are a plurality of sets of gouges as will be seen from Fig. 1, although more or less than the number of gouge sets there shown may be used, and the gouges of each set will differ slightly in that the gouges of the set which follows such a set as shown in the upper part of Fig. 2 will be placed as shown in the lower part of Fig. 2, that is to say, so that the second set of gouges will work upon the wood which was left between the cuts taken by the first set of gouges.

By referring to Fig. 5, we may say that the first set of gouges which would operate upon the wood would cut out portions such as indicated at 17 in Fig. 5, and leave upstanding portions such as indicated at 18. The second set of gouges would cut beneath the upstanding portions 18 so that the final piece removed would include not only the portion 18 but also the lower V-shaped portion 19. The form of the strip removed is fairly well indicated in Fig. 7 of the drawing.

The wheel 12 is so arranged with respect to the log or piece of wood which is to be cut, that the gouges when they engage the wood to cut the same, will engage and cut at approximately an angle of 45° with respect to the longitudinal axis of the log, in which same direction the grain of the log runs, so that the strip cut, it will be seen, is grained transversely of the strip, and therefore enables the strip to be easily parted or broken.

The gouges employed are hollow and the strip of wood passes through the hollow gouge and is dropped from the gouge as the wheel rotates. The strips thus gouged may be collected in a suitable receptacle and are then in condition to be charred.

One form of a feeding means, which may be employed to feed to the gouges the log being cut, is indicated in Fig. 1. This comprises a pusher member 20 which engages the back end of the log or piece of wood. This pusher member has associated with it a nut 21 which is threaded upon a screw 22. This screw shaft is mounted in suitable bearings, one of which is indicated at 23 and at this end the shaft has a bevel gear 24 which meshes with a second bevel gear 25, carried upon a shaft 26 which shaft is mounted in suitable bearings, not shown. Upon the shaft 26 there are a plurality of arms 27 which are in the path of and adapted to be engaged in succession by a plurality of striker members 28 which are carried upon the wheel and which are in such a position as to strike one of the arms 27 just after a set of gouges to which it is adjacent has performed its gouging action upon the wood. This striking of the arm causes the shaft 25 to turn and through the gears 25 and 24 causes the screw shaft 22 to turn and therefore the member 20 forces the log forward in the trough a sufficient distance to present a new surface for the succeeding set of gouges.

A modified form of the machine is shown in Fig. 6. In this form of machine the trough 10 and the presser member 11 are the same. The cutting gouges are also the same, that is to say, so far as their arangement in gangs is concerned, but in place of the wheel 12, I have shown an endless chain or belt upon which the gangs of gouges are mounted. These gangs of gouges will be arranged so that they will cut the log or piece of wood to be operated upon in exactly the same manner as I heretofore explained.

In order to impart rigidity to the gouges as they are cutting the wood, I may provide any suitable form of backing member such as indicated at 30 which will support and give rigidity to the endless belt or chain at that portion thereof which is adjacent the log, so that each succeeding gang of gouges will receive support and be rigidly and firmly held while cutting the wood.

A machine such as shown in Fig. 6 will be equipped with some suitable form of mechanism for feeding the log forward, such as indicated in connection with Fig. 1.

Having thus described my invention, what I claim is:

1. The method of preparing wood for charring, which consists in cutting strips of wood so that the grain extends transversely with respect to the length of the strip.

2. The method of preparing wood for making charcoal, which consists in cutting

from a log or larger piece of wood, strips which in cross section resemble a diamond shape, the grain of the wood in the strips extending substantially transversely with respect to the length of the strip.

3. In an apparatus for the purpose described, the combination with means for holding a piece of wood to be operated on, of a gouge and means for moving said gouge to cut the wood at an angle with respect to the grain of the piece of wood being operated on.

4. In an apparatus of the character described, the combination with means for supporting a piece of wood to be operated upon, of a gouge carrier, a gouge upon said carrier, said gouge carrier being positioned to move the gouge to cut the wood being treated at an angle with respect to the grain of the wood being treated.

5. In a device of the character described, the combination with means for supporting a piece of wood to be operated upon, a gouge carrier, a plurality of spaced gouges mounted upon the said carrier, and means for moving the said carrier, thereby to bring each of said gouges successively into operation upon the piece of wood being cut, each of the gouges engaging with the wood to cut the same at an angle of approximately 45 degrees with respect to the grain of the wood to be cut.

6. In a device of the character described, the combination with means for holding a piece of wood to be operated upon, a plurality of sets of gouges adapted to operate in succession, and means for supporting and moving the said sets of gouges, the gouges of one set being arranged in staggered relation to the gouges of the adjacent sets whereby the gouges of one set cut the wood being operated upon between the portions cut by a preceding set.

7. In a device of the character described, the combination with means for supporting a piece of wood to be operated upon, a gouge carrier, a plurality of spaced sets of gouges mounted upon the carrier, the gouges of each set being arranged in staggered relation to the gouges of adjacent sets whereby the gouges of one set cut the wood operated on between the portions cut by a preceding set, each set of gouges being arranged to cut the wood at an angle with respect to the grain of the wood operated upon.

In testimony whereof, I hereunto affix my signature.

HENRY J. HABER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."