

Substitute for Drawing Lost.

R. MONTGOMERY & L. W. HARRIS.

Breaking and Grinding Bark.

No. 1,714.

Patented Aug. 12, 1840.

Fig. 1.

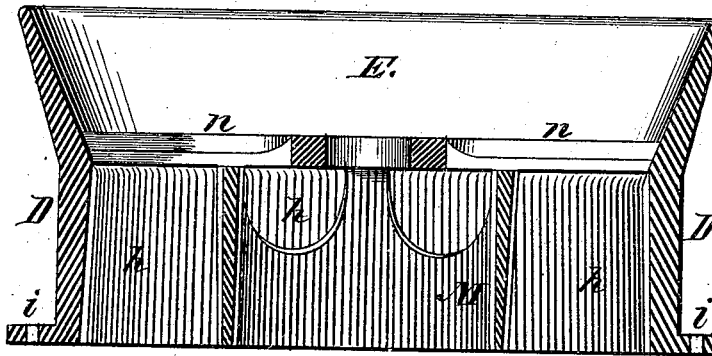


Fig. 2.

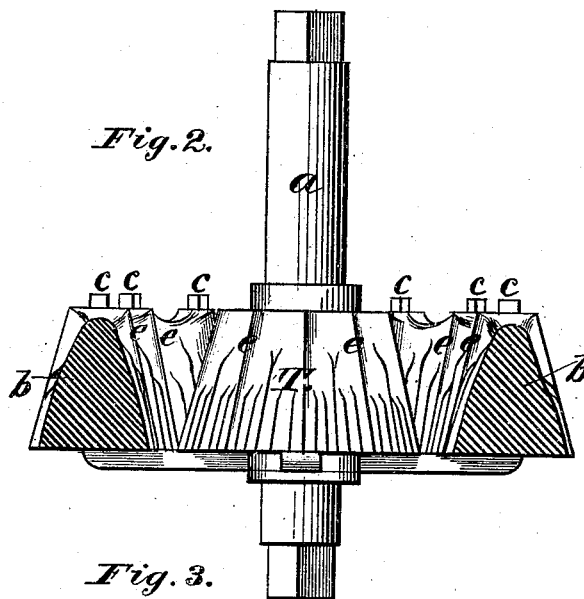


Fig. 3.



Witnesses.

Inventor.

UNITED STATES PATENT OFFICE.

RICHARD MONTGOMERY AND LEWIS W. HARRIS, OF SANGERFIELD, NEW YORK.

MILL FOR BREAKING AND GRINDING BARK.

Specification of Letters Patent No. 1,714, dated August 12, 1840.

To all whom it may concern:

Be it known that we, RICHARD MONTGOMERY and LEWIS W. HARRIS, of Sangerfield, in the county of Oneida and State of New York, have invented a new Mode of Breaking and Grinding Bark and other Substances of a Similar Character; and we do hereby declare that the following is a full and exact description thereof.

The nature of our invention consists in providing a mode of breaking and grinding bark and other substances of a like character by means of hollow stationary cylinders and one or more revolving conical nuts placed concentrically in connection with teeth and pickers the whole constructed arranged and combined as hereinafter particularly described, the machine operating with the like facility and with the same effect whether its revolutions are performed forward or in a counter direction.

To enable others skilled in the art to which our invention appertains or with which it is most nearly connected to make and use such invention we will proceed to describe its construction and operation.

The material parts of our machine are as follows viz:

First. A cylinder D, (Fig. 1,) which is hollow, the sides within and without are perpendicular to the base the interior surface being provided with teeth. This cylinder is stationary.

Second. Another cylinder M, (Fig. 1,) which is also hollow. Its sides like those in the cylinder D, (Fig. 1,) are also perpendicular to the base within and without, and are provided with teeth. This cylinder is also stationary.

Third. A conical nut, b, (Fig. 2,) which is hollow. The sides within and without incline upwards each toward the other at a corresponding angle. The sides within and without are provided with teeth.

Fourth. Another conical nut T, (Fig. 2,) which is solid and through the center and axis of which a shaft passes. The exterior surface of this nut inclines equally on all sides upward toward the shaft (a) (Fig. 2) and is provided with teeth. The nuts, b, and T revolve with the shaft (a) to which they are attached.

Fifth. Fluted teeth, h, h, h, (Figs. 1 and 2,) upon the internal surface of the stationary cylinder D, (Fig. 1,) and upon the internal and external surfaces of the sta-

tionary cylinder M, (Fig. 1,) and upon the external and internal surface of the revolving nut, b, (Fig. 2,) and upon the external surface of the revolving nut T (Fig. 2.)

Sixth. Larger teeth c, c, c, c, (Fig. 2,) upon the external and internal surface of the revolving nut, b, (Fig. 2,) and upon the external surface of the revolving nut T, (Fig. 2.)

Seventh. Square teeth c, c, c, c, (Fig. 2,) with a flat top called pickers standing upon the upper end of the large teeth on the revolving nut (b), (Fig. 2.)

Eighth. Stationary transverse arms n, n, n, (Fig. 1,) to which the cylinders D and M, (Fig. 1,) are attached and which hold these cylinders in their proper position.

Ninth. Transverse arms to which the revolving nuts b and T, (Fig. 2,) are attached and which secure to these nuts a corresponding motion.

Tenth. The shaft, a, (Fig. 2,) which passes through the center and axis of the revolving nut T (Fig. 2,) and to which it is secured.

Eleventh. A hopper, e, (Fig. 1,) for holding the substance to be ground and which is attached to the outside cylinder D, (Fig. 1.)

Twelfth. A cross bar, f, (Fig. 3,) with a socket (u) in its center in which the end of the shaft a, (Fig. 2) turns.

Thirteenth. Ears i, i, i, i, (Fig. 1) upon the cylinder D, (Fig. 1,) through which bolts or screws are passed to secure the machine in a fixed and permanent position.

The drawings which accompanying this specification represent different parts of our machine, and the proper position in the machine of the several parts represented will appear from the description and references.

The stationary cylinders D and M, (Fig. 1,) are provided with low fluted teeth of equal length depth and size, extending longitudinally along and entirely across, the inner surface of the cylinder D, and the outer and inner surfaces of the cylinder M, and disposed at equal distances entirely around them. They are arranged in perpendicular lines parallel to each other and to the upright shaft, a, (Fig. 2,) and are formed and separated by a narrow concave groove extending the entire length of each tooth and on both sides of it.

The revolving nut T, (Fig. 2) which is attached to the shaft, a, (Fig. 2,) is in the

form of a truncated cone its sides retreating upward toward the shaft (*a*). The form of the revolving nut, *b*, (Fig. 2) is that of a hollow truncated cone retreating without
 5 on all sides alike upward toward the shaft, *a*. The interior surface of this nut and the teeth thereon converge on all sides from the top downward toward the lower end of the shaft (*a*), at an angle corresponding with that
 10 of the shaft of the slope externally. The revolving nuts *T* and *b*, (Fig. 2,) are provided with low fluted teeth of an equal depth and size and differing from each other only in length. They are like the small teeth in the
 15 cylinders *D*, and *M*, (Fig. 1), and are situated upon the external side of the revolving nut *T* (Fig. 2,) and upon the external and internal sides of the revolving nut, *b*, (Fig. 2). They begin at the lower termination of the sides and extend longitudinally along
 20 but not entirely across them, and are formed and separated from each other by a concave groove in like manner with those in the cylinders *D*, and *M*, (Fig. 1,) above described and are disposed at equal distances from
 25 each other entirely around these sides. They are grooved out of the lower circular portion of the nuts longitudinally and as far as they extend slope with them. Those upon the
 30 external side of the revolving nut *T* (Fig. 2,) incline toward the upper portion of the shaft *a*, (Fig. 2,) and those upon the internal side of the nut *b*, (Fig. 2,) incline toward the lower end of this shaft. The revolving nuts
 35 *T*, and *b*, (Fig. 2,) are also each of them provided in addition to the small teeth above described with a row of larger teeth, arranged upon the external sides of the revolving nut, *T*, (Fig. 2,) and upon the ex-
 40 ternal and internal sides of the revolving nut *b*, (Fig. 2,). Each tooth extends from the lower termination of these sides upward longitudinally entirely across to the upper termination thereof, and is a mere continua-
 45 tion of some of the small teeth above described extended and gradually increased in depth and size from the point of extension toward the top of the nuts respectively. The large teeth upon the nut, *T*, (Fig. 2,) and
 50 upon the external side of the nut, *b*, (Fig. 2,) incline with the surfaces upon which they are situated toward the shaft, *a*, (Fig. 2,) like the small teeth thereon and at a corresponding angle, while the large teeth upon
 55 the interior surface of the revolving nut, *b*, (Fig. 2,) incline like the small teeth upon this surface toward the lower portion of the shaft (*a*) and at the same angle with the small teeth last mentioned.

60 The back of each of the large teeth on the exterior surface of the revolving nut, *b*, (Fig. 2,) joins at the top of this nut with a large tooth of the same dimension on the interior surface of this nut the back coin-
 65 ciding and the edges facing in opposite di-

rections. Upon the top of each of the large teeth thus united is a square tooth or picker standing parallel to the shaft (*a'*, Fig. 2,) which aids in breaking the bark or other
 70 substance to be ground against the stationary arms, *n*, *n*, *n*, (Fig. 1) as the nuts re-
 volve.

The stationary arms *n* (Fig. 1) are attached to the cylinder *m*, at *n*, and to the cylinder *D*, at *o*. In the center of the arm
 75 *N*, at *P*, is a socket in which the shaft, *a*, (Fig. 2,) turns. The lower circumference of the hopper *e* (Fig. 1,) corresponds in size with the cylinder *D*, (Fig. 1) over which
 80 it is placed and to which it is permanently secured. Fig. 1 represents the stationary cylinders *D* and *m*, and the hopper, *e*, and the stationary arms, *n*, in an inverted position. *R*, (Fig. 1) is the space filled by the
 revolving nut, *b*, (Fig. 2); and *S*, (Fig. 1) that filled by the revolving nut *T*, (Fig. 2,) when placed in their proper positions in the
 85 machine. *g*, *g* (Fig. 1,) are ears upon the stationary cylinder *D*, to which the cross bar, *f*, (Fig. 3) is secured.

90 The nuts *b* and *T*, (Fig. 2) are firmly secured at the base to traverse arms which revolve with them. These revolving arms are like the stationary arms *n*, *n*, *n* (Fig. 1) and connect the nuts *b* and *T* with each other
 95 in the same manner that the stationary arms *n*, (Fig. 1,) connect the cylinders *D* and *m*, (Fig. 1). The lower end of the shaft, *a*, (Fig. 2) is firmly secured to the center of the revolving arms where these arms inter-
 100 sect each other. A revolution of the shaft therefore carries the revolving arms and the nuts *b* and *T*, around with it. *c*, *c*, *c*, *c*, (Fig. 2) are rows of pickers and large teeth upon the nuts *b* and *T* extending entirely around
 105 them. As the nuts revolve under the stationary arms, *n*, (Fig. 1) the bark or other substance to be ground is broken by them against the stationary arms and the sur-
 110 rounding teeth and sides of the cylinders *D*, and *M*, into pieces of a proper size to be acted on by the small teeth in the cylinders and nuts.

115 *h*, *h*, *h*, (Figs. 1 and 2,) are fine teeth upon the inner surface of the cylinder *D*, and upon the external and internal surfaces of the cylinder *m*, and upon the external and internal surfaces of the nut *b*, and upon the surface of the nut *T*. The nut, *b*, performs
 120 its revolutions between the cylinders *D* and *m*. The nut *T*, is surrounded by the cylinder *m*, within which it revolves. The small teeth in the cylinders are of a corresponding size with the small teeth in the nut opposed
 125 to them, and in connection with which they are designed to act. The teeth in the cylinders are perpendicular to the base of the cylinders, and surround the shaft, *a*, in lines parallel to the shaft and to each other. Those in the revolving nuts, surround the
 130

shaft, *a*, in lines inclining toward it as here-
inbefore mentioned, but which are in the
same plane with the axis of the shaft, *a*.
The machine therefore grinds with the like
5 facility, whether the nuts revolve forward
or in a contrary direction.

The bark or other substance to be ground
is placed in the hopper, *c*. The moving
power is applied to the shaft, *a*, which in
10 revolving takes with it the nuts, *b*, and
together with the arms which secure and
connect them to each other. The substance
is broken by the large teeth and pickers
e, *e*, *e*, *e*, (Fig. 2,) against the stationary
15 arms *n*, *n*, *n*, (Fig. 1) and the surrounding
teeth and sides of the stationary cylinders
and falling down between the small teeth in
the cylinders and those in the nut opposite.
is there ground and is then discharged
20 through the small teeth, from the base of
the machine. The revolving nuts being of a
conical shape as above described, and the

teeth thereon inclining with the cone upon
which they are situated as above mentioned,
may be brought nearer to those in the cylin- 25
ders by raising the shaft, *a*, to which they
are attached, or may be removed farther
from them, by lowering the shaft, and in
this manner the machine may be made to
grind coarse or fine as occasion may require. 30

What we claim as our invention and de-
sire to secure by Letters Patent is—

The combination of the conical nuts one
or more with the cylinders placed concen-
trically as herein mentioned and described, 35
and constructed arranged and connected in
the manner herein described, and provided
with teeth and pickers arranged as is also
herein mentioned and set forth.

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LEWIS W. HARRIS.

Witnesses:

JULIUS CANDEE,
L. D. CARPENTER.