New Inventions.

Improved Grinding Mill.

The many improvements which have taken place in mills would seem to leave but little room for further invention, but the subject of our engraving proves that such is not the case, and that great improvements have been effected. B. A. Beardsley, of Waterville, N. Y., is the inventor of this mill, of which Fig. 1 is a perspective, with part broken away to show its interior construction, and Figs. 2 and 3 are different plans of the grinding surfaces.

A represents a vertical shaft, the lower end of which may be stepped in an adjustable bridge, and arranged in the usual or any proper way. On the lower part of the shaft, A, a conical or semi-spherical cast iron shell, C, is permanently secured. This shell has upright taper or conical teeth, *a*, on its upper surface, and around its lower part a finely toothed or corrugated strip, *d*, is formed. Just above the toothed strip, *d*, triangular projections or teeth are formed, said projections alternating with the lower row of teeth, *a*, on the shell, C.

The shell, C, is encompassed by a cast iron case, D, of conical form, provided on the upper part of the inner surface with teeth, *b*, and at its lower part with fine teeth, *e*, which correspond to the teeth, *d*, on the shell, C. The teeth, *b*, are not placed very near each other, as will be seen by referring to Fig. 2, where they are marked *d*. The case, D, is stationary, secured to any proper framing, and to the bottom of the case, D, arms, E, are attached, crossing each other at right angles, and having an aperture made through its center, through which the shaft A, passes, their arms serving as a guide to the lower part of the shaft. To the upper part of the case, D, arms, F, are attached, these arms are of inclined or curved form corresponding to the inclination or curvature of the shell, C, and cross each other at right angles, a circular opening being allowed at their point of intersection to allow the shaft, A, to pass through. The arms, F, are provided with conical teeth, *g*, both on their upper and lower surfaces, as seen in Fig. 1. G is a conical or semi-spherical shell or case which is permanently secured to the shaft, A, and is provided with teeth, *h i i'*, on its upper surface precisely similar to the teeth, *a d e*, on shell C. Through the shell, G, an orifice, *j*, is made, the edges of which are made knife-edged as shown in Fig. 1. The under side of the shell, G, is also provided with teeth, *k*, precisely similar to the teeth, *a*, on shell, C, and the teeth, *h*, on the upperside of shell, G. The lower edge of the shell, G, has a rebate formed in its lower edge all around it, the rebate forming a shoulder or guard, which projects over the upper edge of the case, D. The lower edge of shell, G, fitting in a rebate, *b'*, made in the upper edge of the case, D, (see Fig. 1). The adjoining edges of the shell, G, and case, D, are therefore fitted one into the other, and a certain degree of vertical play or movement is allowed the shaft, A, and consequently the shells, C G, without exposing a space between the shell, G, and case, D. This play or movement is necessary in order that the shell, G, may be adjusted to grind coarse or fine as may be desired. The employment of the guard serves to prevent the escape of the contents of the mill between the lower edge of shell, G, and the top of the case, D. If no guard were employed it would be impossible to raise the shell, G, for adjustment, without leaving an opening between the shell and the case, through which the contents of the mill would immediately pass out.

H is a case, the lower end of which is bolted to the upper end of case, D. The lower part of case, H, is of conical form corresponding in form to the case, D, and its international surface is toothed precisely similar to the interior of case D, *m* representing the portion of the fine and *n* the coarse teeth. Within the case, H, and at the upper part of the lower portion of the case, arms, I, are placed. These arms cross each other at right angles, and have an opening at the point of intersection for the shaft, A, to pass through. The arms, I, are provided with teeth, *o*, both on their upper and lower surfaces. The arms, I, are constructed precisely similar to the arms, F of case, D. The upper part, *p*, of the case, H, is of inverted conical form and serves as a hopper. J is a cutter which is attached to the shaft, A, a short distance above the arms, I (see Figs. 1 and 3).

The operation is as follows:—Motion is given the shaft, A, by any proper means. The shells, C G, and cutter, J, rotating of course with the shaft, A, the arms, F I, remaining stationary. The bark or other substance to be ground is placed in the hopper or upper part, *p*, of the case, H, and is cut or partially crushed by the cutter, J, aided by the teeth, *o*, on the upper surfaces of the arms, I, the teeth, *o*, having a tendency to hold the bark while it is acted upon by the cutter, J. The bark partially crushed passes down, and the finer portion is further acted upon by the teeth, *h i*, on shell, G, and the teeth, *n*, on the inner side of the case, H, and finally ground by passing between the teeth, *m i'*. The larger portion of the bark that cannot readily pass down between the shell, G, and case, H, will pass down through the aperture, *j*, in the shell, G, and will be further crushed by the teeth, *k*, on the under side of shell, G, and the teeth, *g*, on the upper surfaces of the arms, F, and by the action of said teeth the bark will be sufficiently reduced to pass down between the shell, C, and case, D, and escape from between the fine teeth, *e b*, thereof, in a properly ground state.

BEARDSLEY'S GRINDING-MILL.

Fig. 1

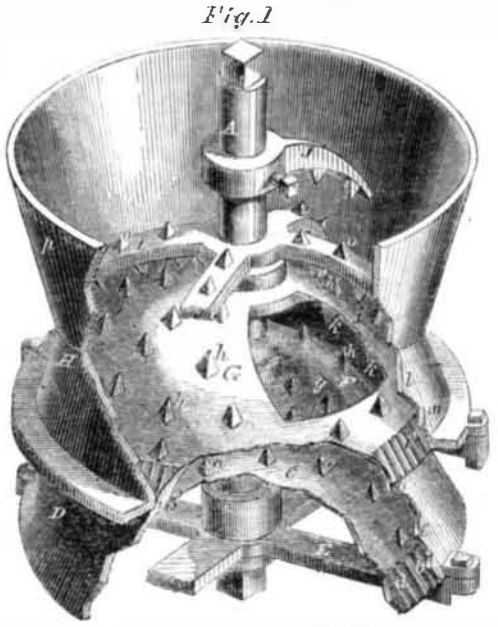


Fig. 2

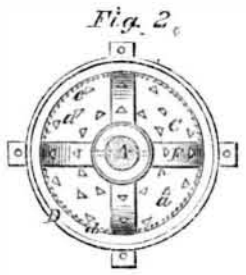
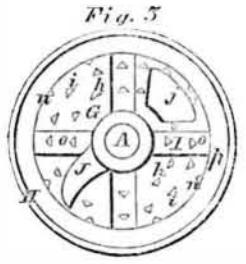


Fig. 3

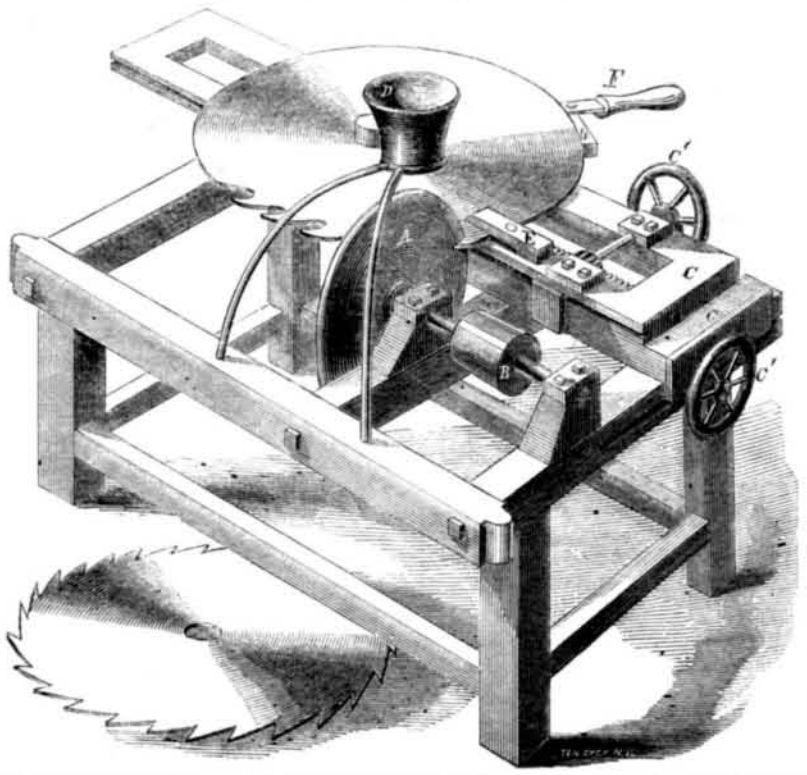


The mill may be made to grind coarse or fine by elevating or depressing the shaft, A, so as to increase or diminish the width of the space or passage through which the bark passes.

From the above description it will be reen that a large grinding or crushing surface is obtained quite near the shaft, A, for the shells, C G, may be of comparatively small diameter, say 18 inches. the smallness of the diameter of the shells being compensated for by their number for it will at once be seen that any number of the shells and cases may be used, the bark in passing through the mill being successively acted upon by each shell. The grinding capacity, therefore, of the mill may be made very great while the power required to operate or drive it will be proportionably small, in consequence of the grinding and crushing surfaces being quite near the shaft, A.

The invention was patented June 29, 1858, and any further information can be had by addressing the invention as above.

WOLF'S SAW GUMMER.



This saw gummer is operated by power, works very quickly, and does not spring, stretch, or strain the saw plate. It keeps the teeth uniform, and cuts out the gums as fast as the points wear away. Our view is a perspective, showing the whole machine.

A is the stone gummer, shaped properly at first, and as it wears it retains its shape, wearing equally on all sides. This has a very high velocity given it from the drum, B, moved by a belt; and the greater the velocity, the less tendency is there to wear. C C are carriages, moved by the hand wheels, C' C', on which the saw is fixed, and which can be moved to and from the stone in any position. The saw is hung on its center by a bolt with a thumb nut running through a center pin. D is a cup for oil or water placed over the stone, to keep it cool while at work. The clamp, E, holds a screw from turning on its center when the carriages are moved towards the stone for the purpose of cutting out the gums. When one tooth is gummed out to the proper shape, two movable stops on the main beams are set against the carriage, to keep it from going too far towards the stone; these stops are not seen. By this arrangement, all the teeth are made the same depth.

After the gums are all cut out, the clamp is removed from the edge of the saw, and the point of the tooth is brought out until it nearly touches the stone, then by taking hold of the iron bar, F, that extends under the saw, the center bolt being drawn tight, so that it cannot turn, and moving the iron bar around towards the band wheels, the back of the tooth will be dressed from the point to the root; and using the point of the teeth as a dial plate, the backs can all be cut alike. For rounding the saw, it must be loosened on its center, the shortest tooth brought to the stone, and then turned on its center, to cut all the teeth the same length. The bar, F, will suit all sizes of saws, and the teeth can be cut in large or small curves, as may be desired.

A circular saw of sixty inches in diameter, with twenty-four teeth, gums cut three-fourths of an inch in depth, has been gummed in one of these machines in less than an hour, with a very trifling cost for the wear of the stone; and, as we have before said, the faster the stone is made to revolve, the less it wears in cutting out the metal. Sash, muley, and other straight saws can be gummed as well as circulars, and the stones can be formed to cut teeth of any shape the sawyer may desire.

It is the invention of H. R. Wolf, of Louisville, Ky., and was patented October 5th, 1858. For machines, rights, and further information generally, the reader should address Staples, Watson & Co., Consolation, Shelby co., Ky., or Munn & Co., manufacturers and agents, Louisville, Ky.

Improved Stone-Cracker.

In order to accomplish economically and perfectly the cracking of stone by mechanical means to a size suitable for macadamizing or ballasting railroads and highways, a machine of great strength, durability, and considerable cost, is necessary; and therefore it is important to so construct and arrange the cracking teeth, which are subjected to a very great resistance, strain, and wear, that they will be able to effectively perform the duty assigned them, under ordinary circumstances, without breaking off, or being impaired to an extent beyond that common to all similar mechanical combinations which act with friction against resisting objects with which they are brought in contact; and in the event of one section of the teeth being exerted beyond their strength, and said section should give way, facilities shall be afforded, whereby the worn, broken, or impaired sections may be removed independently of the perfect sections, and others introduced in their stead at a small cost, and with very little labor and delay. This invention provides a machine which will economically and practically crack stone to a size suitable for the purposes stated, and possessing all the above-named requisites. It is the invention of A. C. Ellithorpe and L. Scoville, and was patented November 23d, 1858.

The production of the 2,597 coal mines in Great Britain is supported to be worth seventy-five million dollars a year.