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## IMPROVED GEAR CUTTING ATTACHMENT FOR LATHES.

Not long ago we illustrated an ingenious work holder for lathes, the device of Mr. William P. Hopkins, of Lawrence, Mass. The same inventor has also produced another attachment for the same machine, the object of which is to cut gears. The work is operated upon by a cutter turning upon the centers of the lathe, and is held and governed by the means represented in the illustrations and described below.

A is the arbor box, in which freely turns a hollow spindle, B. Through the latter passes a tapered arbor, C, on the upper and larger extremity of which the gear wheel to be cut is secured. Fastened to the hollow spindle by means of a set screw, and hence rotating with it, is the index pulley, D. Attached to the arbor box is an arm in a slot, in which travels an index point, E, connected with a suitable spring, which holds its extremity in any of the orifices on the pulley, D, to which it may be adjusted. Several rows of different numbers of these apertures around the pulley, D, provide various graduations; and from the pointer, E, traveling freely along its slot, it may be readily placed over any desired row. When one groove or space is cut in the work, the pointer is lifted from the orifice, and the pulley turned, carrying with it the arbor spindle and its attachments until the next hole is met and entered by the index point. The number of holes in each row is marked upon the face of the slide clasp, F, directly over each series of apertures. The clasp slides entirely around the circumference of the index pulley, and can be used to mark the number of holes passed under the index point, serving the purpose of the spacing point on common gear-cutting machines.

The device may be attached to the lathe tool carriage, as represented, or bolted on top of the tool post block, when the point shaft box slides down below the angle iron frame. By means of the worm and segment, shown in Fig. 2, the pivot shaft may be rotated, so setting the attachment at any angle for cutting any variety of straight or bevel gear. The long set screw, G, serves to adjust the elevation of the device, and the remaining adjustments are obtained upon the ordinary lathe carriage in manner readily understood. The hollow spindle upon which the index pulley is fastened can be removed, and a solid one substituted, on one end of which a small chuck is fixed. The latter may be used for a variety of purposes with convenience and advantage.

The index pulley has 28 different graduations, and with two pulleys any graduation under 100, and all even numbers up to 130, can be cut. A small level on top of the index pulley indicates the proper adjustment for straight or spur gears. The construction of the device, we are informed, is of the most careful description, well calculated to insure durability and efficiency.

The apparatus may be seen at this office, and for her particulars may be obtained by addressing the inventor as above. Patented September 30, 1873.

### The California Wood Rat.

In a recent number of the *American Journal* is an extract of a letter from Mr. A. W. Chase, U. S. Coast Survey, concerning the habits of the so-called California wood rat. It is a little larger than an ordinary Norway rat, dark brown in color, with large lustrous eyes, and a tail covered with thin hairs. I should call

it intermediate between the squirrel and rat. This creature builds its nest in the woods, sometimes on the ground, more frequently in the lower branches of trees. They accumulate

city of this little creature that I wish to call attention. To make my story intelligible, I would first state that I am partial owner of some property on the Oregon coast, on which a saw mill had been placed, but which, owing to various causes, has never been in operation. On this property was a dwelling house for the hands, in which, on work being discontinued, were stored a quantity of stuff, tools, packing for the engine, six or seven kegs of large spikes; in the closets, knives, forks, spoons, etc. A large cooking stove was left in one of the rooms.

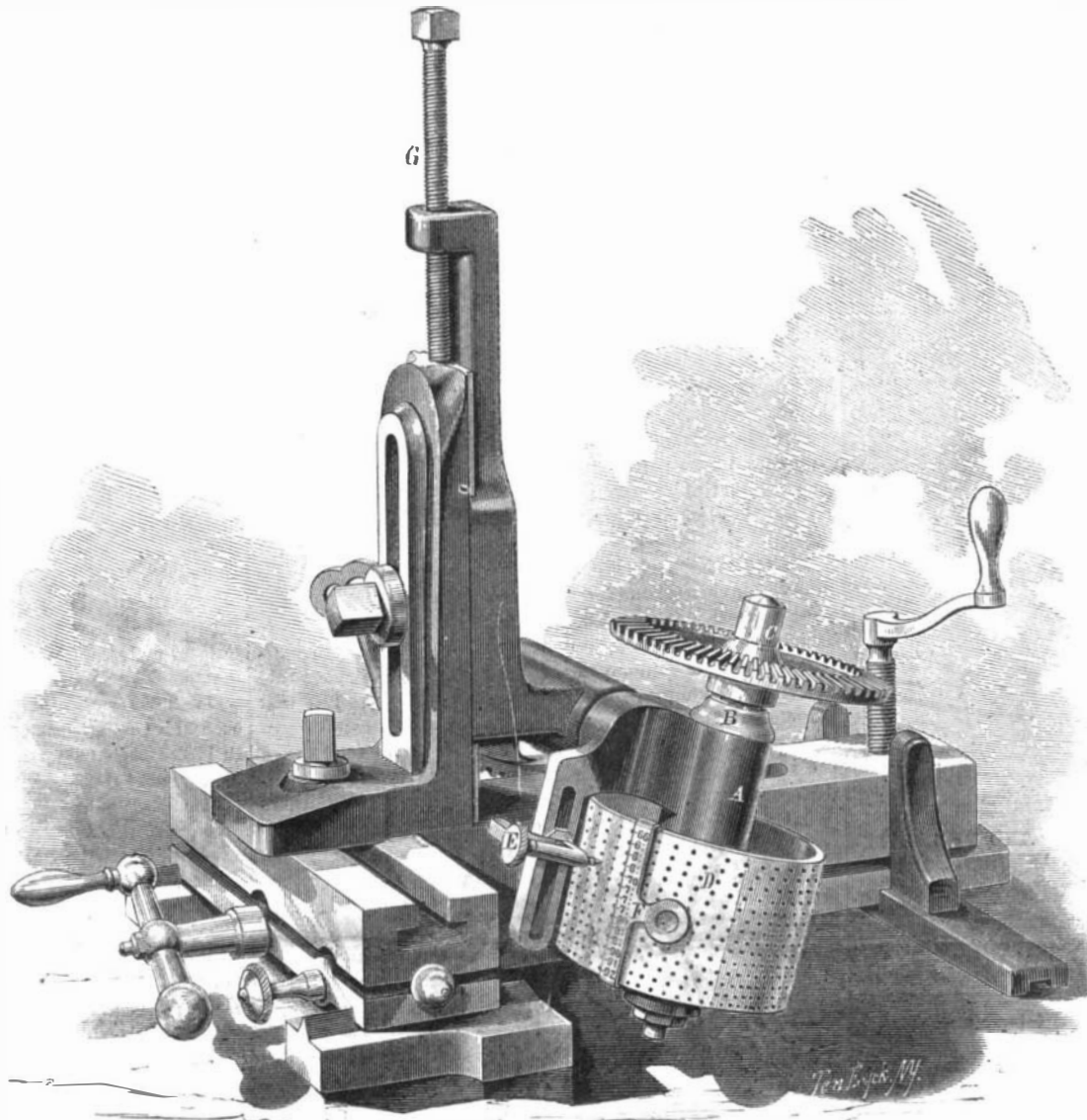
This house was left uninhabited for two years, and, being at some distance from the little settlement, it was frequently broken into by tramps who sought a shelter for the night. When I entered this house I was astonished to see an immense rat's nest on the empty stove. On examining this nest, which was about five feet in height and occupied the whole top of the stove (a large range). I found the outside to be composed entirely of spikes, all laid with symmetry so as to prevent the points of the nails outward. In the centre of this mass was the nest, composed of finely divided fibers of the hemp packing. Interlaced with the spikes, we found the following: About three dozen knives, forks, and spoons, all the butcher knives, three in number, a large carving knife, fork, and steel; several large plugs of tobacco; the outside casing of a silver watch was disposed of in one part of the pile, the glass of the same watch in another, and the works in still another; an old purse containing some silver, matches, and tobacco; nearly all the small tools from the tool closet, among

them several large augers. Altogether, it was a very curious mixture of different articles, all of which must have been transported some distance, as they were originally stored in different parts of the house.

The ingenuity and skill displayed in the construction of this nest and the curious taste for articles of iron, many of them heavy, for component parts, struck me with surprise. The articles of value were, I think, stolen from the men who had broken into the house for temporary lodging. I have preserved a sketch of this iron-clad nest, which I think unique in natural history.

Many curious facts have since been related to me, concerning the habits of this little creature. A miner told me the following: He once, during the mining excitement in Siskiyou county, became in California parlance "dead broke," and applied for and obtained employment in a mining camp, where the owners, hands and all, slept in the same cabin. Shortly after his arrival small articles commenced to disappear; if a whole plug of tobacco were left on the table, it would be gone in the morning. Finally a bag, containing one hundred or more dollars in gold dust, was taken from a small table at the head of a "bunk," in which one of the proprietors of the claim slept. Suspicion fell on the new comer, and he would perhaps have fared hardly; for, with those rough miners, punishment is short and sharp; but, just in time, a large rat's nest was discovered in the garret of the cabin, and in it was found the missing money, as well as the tobacco and other articles supposed to have been stolen.

STEAM on our canals seems to be an accomplished fact. Six boats are now plying on the Erie canal and twelve others will shortly be added, all capable of making the trip from New York to Buffalo in five days. It is believed that the grain trade of the fall will be considerably affected by the increased cheapness of transportation.



HOPKINS' GEAR CUTTING ATTACHMENT FOR LATHES.

a surprising quantity of dried twigs, which they interlace to form a dome-shaped structure, often ten or twelve feet high and six or eight feet in diameter.

Openings in the mass lead to the center, where is found the nest, consisting of the finely divided inner bark of trees, dried grass, etc. But it is to the peculiar thievish propen-

Fig. 2

