SCIENTIFIC AMERICAN

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

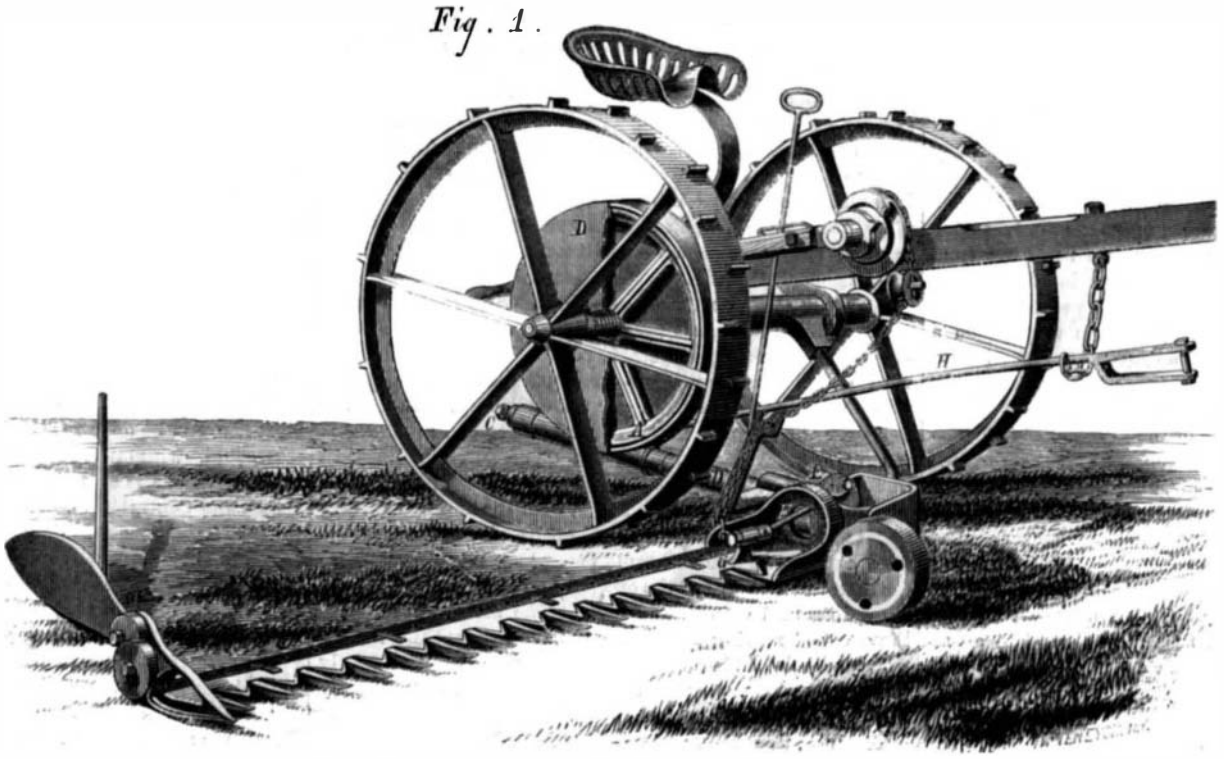
Vol. XXV.--No. 22. [NEW SERIES.] NEW YORK, NOVEMBER 25, 1871. $3 per Annum. [IN ADVANCE.]

GOODWIN'S SCREW MOWER AND REAPER.

The Screw Mower and Reaper.

A new mechanical movement, as a possible element of future machines, always possesses a peculiar interest. This interest is greatly hightened when, as in the present instance, such a movement has been demonstrated to be of real practical value. The peculiar feature, of the mower and reaper shown in our engravings, is the application of a worm wheel and screw to the rotation of the crank shaft which drives the cutter bar, which worm wheel and screw possess features that entitle the arrangement to be classed as a new movement. Fig. 1 is a perspective view, the parts of the machine being lettered as follows: A is the worm gear wheel, B the screw, C the step pin, D the casing of the worm gear, a portion being broken away, E the connecting rod wheel, F the connecting rod, G the cutter bar, and H the draft rod.

Fig. 1.



The latter is so attached that the draft is applied to the rear of the axle in such a way as to throw nearly the whole weight of the machine on to the axle, and thence on to the driving and carrying wheels. Side draft is balanced by making the outside drive wheel slightly smaller than the inside, thus throwing more labor on the former. In regard to the worm wheel, it will be seen, on reference to Fig. 2, that it is peculiarly constructed, the teeth being formed very differently from those of the ordinary worm gear, where the screw actuates the wheel. In this case, the wheel impelling the screw, the teeth are so cut that they only operate on that side of the axis of the screw at which they disengage from their contact with the thread.

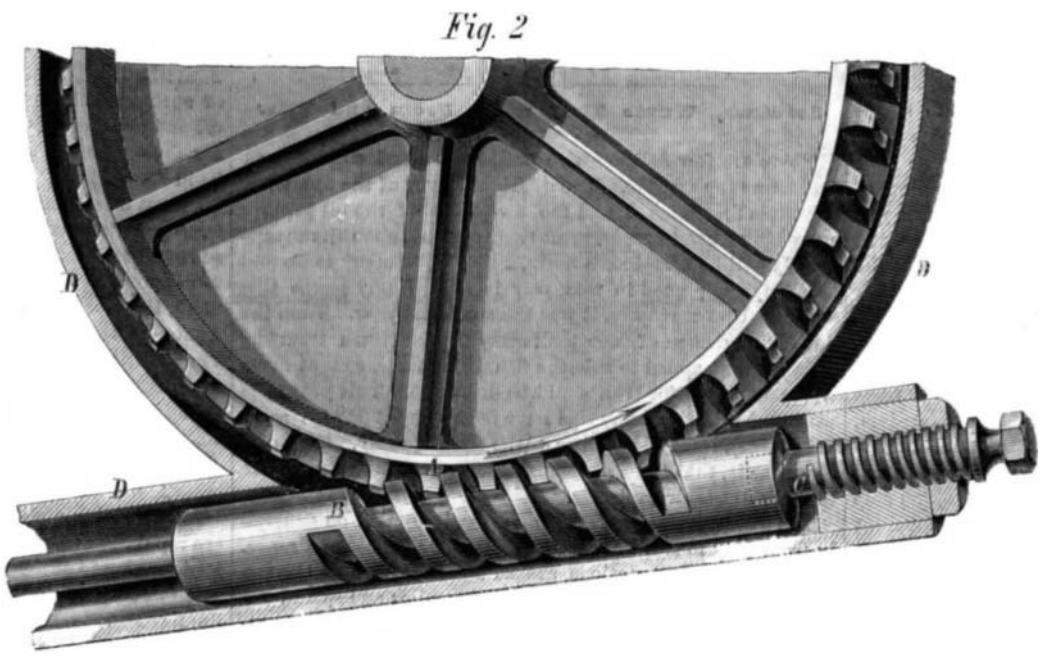
At first sight this may seem a trifling alteration from the old form, but in effect it so much reduces the friction of this kind of train that we are assured actual test shows a reduction of loss from friction in the application of power, in favor of this train, as compared with the best cut spur gearing. A moment's reflection will serve to convince our mechanical readers that teeth made to act on both sides of the axis of the screw will, at the side on which they enter, really act to consume the power applied at the other side, on account of their coming in contact before they have fully entered the interspaces, and the strong lateral pressure they exert upon the journals of the screw shafts. By the peculiar pitch of the screw thread employed in this movement, and the shape given to the teeth, the two do not come into contact until the teeth reach the position to act with greatest power upon the incline of the thread, and with the least friction.

By this means the end thrust of the screw, received by the step pin, C, is so reduced that, we are told, a nickel five cent piece, placed between the end of the step pin and its bearing in the end of the shaft, did not wear out during a whole season of active work in mowing and reaping, and that no trouble from heating has been experienced.

The screw is of steel, double threaded, and consequently revolves once on the passage of two teeth. The worm gear is of gun metal, which further reduces the friction. The simplicity of the arrangement is apparent, and we are assured the proprietors will at any time test their machine with others to show its superior lightness of draft.

As shown in Fig. 1, the gear is inclosed in an iron case, which forms part of the frame.

Fig. 2



The finger bar, shoe, etc., are attached to or taken from the frame, without bolts or pins, by a hinged coupling, that allows the bar to work below or above a level. The bar can be thrown entirely up by the driver while in his seat, without stopping his machine; the cutting apparatus may be adjusted to any required hight or set at any angle, and the main frame to swing under or over the axle, thereby giving a front or rear cut combined, without disturbing in the least the driving device. The frame may be cast all in one piece, or parts of it made of wrought iron.

On the whole, we incline to regard this an important and valuable improvement, an opinion that is strengthened by reports that reach us in regard to its working during two seasons of actual service.

Three manufactories are now making the machines, and at one, in Wheeling, Va., 1,000 machines are now building. The patent is now owned by the Universal Mower and Reaper Company, 91 Liberty street, New York, who will license the manufacture of the machines, or the application of the screw and worm gear attachment, on royalty. The machine was patented by Wm. Farr Goodwin, March 30, 1869, and August 29, 1871.

A Burmese Hairy Woman.

A correspondent of the London *Times* writes to that journal the following particulars, referring to a hairy woman and her children, of whom he had before spoken in his letters: "When I was at Mandalay in 1859, I saw the same woman and three of her children. The eldest and youngest were hairy like their mother, while the second, like his father, presented no such peculiarity. The husband was a man who report said was induced to wed this woman to become possessed of the marriage portion which the King of Burmah had promised to bestow upon her on her bridal day. The bridegroom was a plucky individual at any rate, though his motives may have been mercenary. The hairy woman, whose name I forget, had a pleasant and intelligent face—there was nothing whatever repulsive in it. The hair on the face and breast was several inches long; on the forehead it was parted in the middle, and blended with that of her head. Of a light brown color on her cheeks, it paled gradually towards the bridge of her nose, and the centre of her lips, chin, and neck Those of your readers who have a copy of Colonel Yule's narrative of the embassy to Ava will see a good likeness of the woman, and a description of herself and family."

ROOFS, PAVEMENTS, AND SAFES, UNDER FIRE AT CHICAGO.

The office of the *American Builder*, at Chicago, sharing the common fate of the other periodicals, during the late conflagration was burned down. But the publishers, with commendable enterprise, have reproduced the publication, and the number for November, now before us, contains much interesting matter, from which we take the following:

ROOFS.

"The business blocks of Chicago were covered, chiefly, with paper coated with tar and gravel, a preparation commonly known as felt roofing. Even the 'fireproof' *Tribune* building was covered with this material, which has been in general use throughout the United States for a number of years. During the progress of the fire it became very evident that these roofs assisted materially in the spread of the conflagration. The heat was, of course, intense where adjacent buildings were in flames, the tar melted, and ignition was the consequence; so that roofs which ordinarily resist fire, in this instance were prime aiders in spreading it.

"The *Builder* has always been opposed to the use of this kind of roofing material, and now we insist upon it that architects and builders abandon it altogether. It may be well enough to use it upon isolated cheap dwellings, but let us have no more of it within the fire limits. Let no architect who values his reputation recommend it to his client. In place of paper and tar, we have tin, iron, or, what is better than either, concrete. This latter will endure fire, and it is not expensive. Our concrete pavements stood intact where great flaggingstones flew to pieces. We commend the concrete for roofing purposes, and trust the architects may be induced to listen to reason and experience, and recommend it for all brick and stone edifices.

PAVEMENTS.

"Noticeable among the results of the late fire was the effect upon the different pavements. The Nicolson is, in many places, completely honeycombed, the fire having eaten its way downward into as much of the wood as was dry enough to burn.

"The concrete pavement, which had been laid down in small patches by way of experiment in different parts of the city, endured the test well, and is today in as good condition, apparently, as before the fire. So that, as regards one quality at least, there is little chance for comparison between the wooden and concrete pavements, so great is the advantage in favor of the latter. And there occurs no convincing reason why the concrete should not be more generally adopted. In the instances where it has been employed, the results seem to have been very satisfactory. The wear of heavy vehicles has produced little impression wherever the concrete has been properly laid, and the surface presented is even and well adapted to the transportation of heavy loads. Appearances certainly indicate that, in point of convenience and durability, the concrete is the pavement for the future. We have not the figures indicating the relative first cost of the different pavements, though the concrete is certainly expensive; but, unless a greater difference exists than appears likely, it would seem that economy and a regard for the public good demand a substitution of the concrete for the wooden surface of our streets.