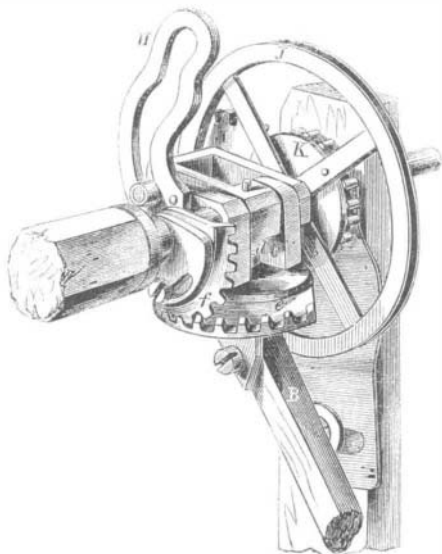


Improved Self-Raker for Harvesters.

The invention here illustrated is one of the most ingenious in the agricultural line that we have examined for a long time. Ever since the introduction of reaping machines efforts have been made to devise a self-acting rake, to clear the platform of the grain, so as to dispense with the operator employed for that purpose. The motions required in this operation are very peculiar. The rake must sweep across the platform in a horizontal direction, and then be carried over the reel ready for the next sheaf. The novel mechanism by which these motions are obtained in this rake will be understood by an inspection of the engravings, of which Fig. 1 is a perspective view of a reaper, with the rake attached, and Fig. 2 is an enlarged view of the gearing.

The rake, A, is supported by a beam, B, and for the horizontal sweep this beam is attached to the loose collar, C, on the reel shaft by a vertical pivot, *d*. It is manifest that by swinging the beam around this pivot the rake will be swept horizontally over the platform of the reaper. To swing the beam around the pivot, *d*, the horizontal segment, *f*, is secured rigidly to the beam, and engages, by a beveled gear, with the vertical segment, *f*, which is fixed rigidly to the shaft of the reel, G. The reel is turned by a chain from the axle of the driving wheel of the reaper, which passes around a pulley, J, on the reel shaft.

After the rake has passed across the platform and removed the grain, it is lifted up and carried over the reel. To effect this movement an arm, H, is fixed rigidly to the collar, C, and a slot is cut in this arm to receive the end of a crank attached to one end of the axle of the pinion, I. The journals of this axle are secured to the pulley, J, so that the pinion, I, is carried around the shaft of the reel at each of its revolutions. The pinion, I, meshes into the fixed



pinion, K, having an equal number of teeth, which causes it to revolve once on its own axis during each of its revolutions around the shaft of the reel. This imparts such motion to the crank on the end of the axle of pinion, I, as to bring this crank to the lower end of the slot in the arm, H, just as the rake has completed its passage across the platform, and then this crank, in its onward movement, carries the collar, C, and with it the rake, around the shaft of the reel.

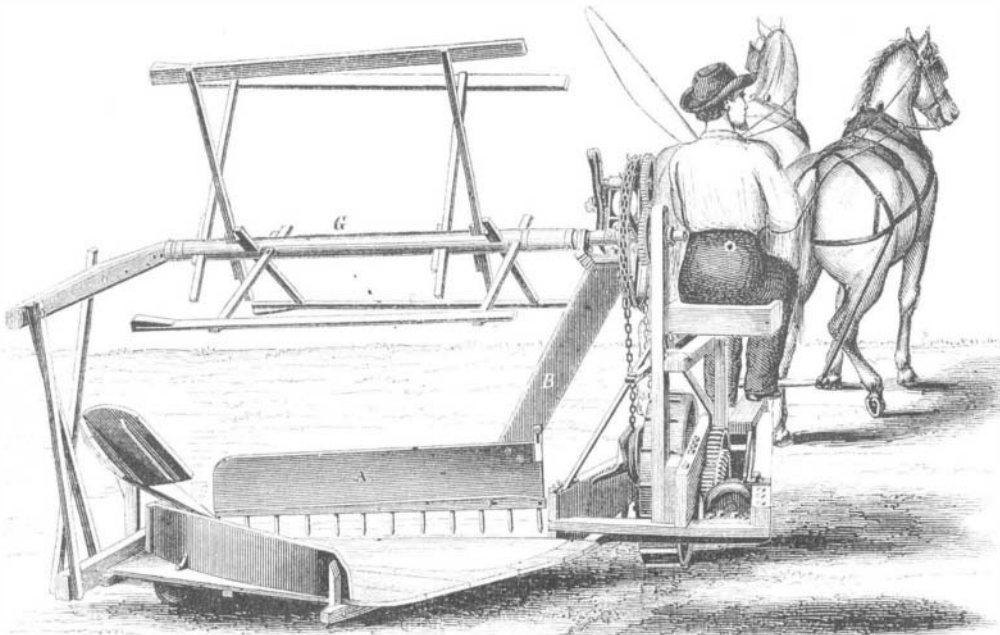
During this revolution the crank is carried to the outer end of the slot in the arm, H, and the segments, *e* and *f*, are turned back, ready to repeat their operation of sweeping the rake over the platform.

The patent for this invention was granted March

29, 1859, and further information in relation to it may be obtained by addressing the inventors, Isaac S. and Henry R. Russells, at Newmarket, Md. [See advertisement on another page.]

Surface Condensers and Boilers.

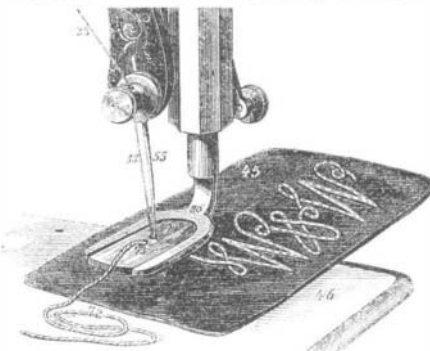
In the article on the above subject, page 245, present volume, SCIENTIFIC AMERICAN, illustrated with Sewell's condenser, it is stated that the boilers of one of our naval steamers which had a surface condenser had become honeycombed. We alluded to the *Dacotah*. Since then we have been informed on good authority that the first reports circulated respecting the boilers of this steamer were greatly exaggerated. In



RUSSELLS'S SELF-RAKER FOR HARVESTERS.

1859 this vessel went on a voyage to the East Indies, having Sewell's surface condensers and tubular boilers, with brass tubes. Word was sent back to the Naval Department that her boilers were rendered almost useless going out, and upon this information orders were given to have new boilers made and ready to be put in when she returned. She arrived in New York a few months since, and was about proceeding to Boston to get in her new boilers, but, before doing so, her engines and boilers were thoroughly examined. To the surprise of many persons he found the boilers quite good, and the result is the *Dacotah* is now at sea and in active service with her old boilers. Mr. Sewell has informed us that all his condensers hereafter to be made for the U. S. steamers will have tinned tubes and iron feed pipes.

SEWING MACHINE IMPROVEMENTS.



We herewith illustrate further improvements added to the Wheeler & Wilson sewing machine, namely, the "braider," a device for sewing braid or cord upon any kind of fabric. The braid or cord is passed through the hole, 72 (see engraving), of the ordinary glass presser, 71, of the machine and stitched upon the fabric, 46, in the most elaborate designs without any previous basting. Its value is best set forth by a lady's hand as follows:—

A new improvement has lately been added to the Wheeler & Wilson machine (which, by the way, we considered long ago to be as nearly perfect as any human contrivance could be), being an attachment for sewing braid upon cloth, silk or any material. If any of our friends have been through the tedious operation of braiding children's dresses, they will realize the great

relief that awaits them in this invention. The braid follows the needle with perfect accuracy, taking any curve desired, so that the most intricate pattern may be braided with great rapidity. Every lady may now possess one of those lovely chambray morning robes embroidered in vines and labyrinths of white braid, which have heretofore fallen to the lot only of the most industrious and ingenious. For summer dresses nothing can be more elegant and becoming. We hail this improvement as a confirming evidence of "a good time coming" for the ladies one and all. And we may as well include the gentlemen, for there will doubtless be an immediate harvest of elaborate smoking caps, and velvet slippers embroidered with gold braid. Long live the sewing machines!

Patent Moss Baskets.

At the spring exhibition of the Brooklyn Horticultural Society (just closed) Mr. Chamberlain exhibited some of his patent baskets, filled with the choicest plants, vines and flowers, growing in the greatest luxuriance and vigor, filled with both fruit and bloom. A black Hamburg grape vine, with the bunches fully formed, with strong shoots and as promising as any grown in a grapyery with all the care and attention that could be bestowed on them by the most experienced cultivator; two baskets containing peach trees, the fruit the size of walnuts, were also shown, in small wire baskets of

eight inches diameter; a basket containing an azalia in full bloom, roses, carnations, pansies, fuchsias, variegated-leaved plants, ferns and mosses, all exhibiting a state of growth never attained in pot culture.

For this novelty (which it truly is), the patent for which was obtained through the Scientific American Patent Agency, the Society awarded Mr. Chamberlain a special premium. At the summer and fall exhibitions he proposes to exhibit the fruit fully matured, which will settle beyond any doubt the value of his invention.

Our readers will find an illustration of this new method of cultivating fruit in No. 22, Vol. V. (new series) SCIENTIFIC AMERICAN.

Artificial Acetilene.

M. Berthelot, of Paris, has succeeded in a most interesting chemical experiment, resulting in nothing less than the direct combination of hydrogen and carbon. Having for a long time been convinced that by placing hydrogen in contact with carbon, at an extremely elevated temperature, they would combine with each other, he tried the experiment at all temperatures, but, at first, without obtaining the desired result. Finally, the extremely simple and happy idea occurred to him of making a current of hydrogen pass between the two carbon points of the electric light excited by Bunsen's battery of 60 elements, and then his efforts were crowned with success. At this extreme temperature the hydrogen combines with the carbon, and the product of the combination is carbide of hydrogen, discovered some years ago by M. Berthelot, to which he gave the name of acetilene. He has been able to collect sufficient of the product to submit it to numerous experiments, and he finds that it possesses all the properties of acetilene derived from organic sources. M. Berthelot had previously succeeded in—firstly, forming by means of mineral compounds, and by a purely chemical method, the principal carbides of hydrogen; secondly, in transforming these carbides into alcoholic compounds; but this was neither a carbide nor an alcohol resulting from the direct combination of two mineral principles—from carbon and hydrogen. This, however, is only a philosophical production of alcohol, not yet available for manufacturing purposes; though, as a scientific fact, it is both curious and important.