Self-Indicating Balance Barometer.

We find in the "Annual of Scientific Discovery," for this year, the description of an instrument of the above name, invented by M. Secchi, of Rome, which appears to be a good invention, and worthy of more general attention than it has yet received. Suppose the mercury bowl of a barometer to be placed on a table and the glass tube so arranged as to admit of its being lifted by hand, the force that will be required to lift the tube will be equal to the weight of mercury in the tube, or, in other words, to the amount of atmospheric pressure exercised on the mercury of the instrument. We shall therefore be able to weigh the pressure of the atmosphere by attaching the tube of the barometer to the one end of a balance, and a weight to the other, for it is evident that at every change in atmospheric pressure, a corresponding increase or decrease in weight will have to be made at the other end of the balance to maintain equilibrium. To ascertain the value of absolute pressure on a unity of surface, it will be necessary to take into consideration the weight of the tube, and also the weight of that portion thereof which is immersed in the mercury of the barometer bowl, and especially the internal sectional area; the force which actuates the instrument may also be increased, and permit of more minute and exact readings. If the sectional area be ten square centimeters (a centimeter is ·39370 of an English inch), and as the pressure varies by centimeters in hight, the weight to be placed at the other end of the balance, will be that of nineteen cubical centimeters of mercury, or one hundred and thirty five grammes (a gramme is 15·4440 English grains), while, if the sectional area had been equal to one square centimeter only, the weight would have been but 13·5 grammes.

Starting from these observations, M. Secchi constructed his balance barometer, which has been successfully used for some time in the Roman Observatory. The tube of the barometer is attached to one end of a steel yard or balanced lever, which carries at the other end a counterbalance weight and a small pointer, which is reflected in a mirror. There is also a graduated scale reflected in this mirror, so that a very minute variation of the pointer is indicated by a movement on the reflected image. As the atmospheric pressure is thus weighed, as it were, and not indicated by the hight of the column of mercury, the tube may be made of cast iron instead of glass, as the iron is not liable to become amalgamated with the mercury, if the tube is of equal bore throughout. By increasing the sectional area of the tube, sufficient motive power will be given to the lever, to operate a pencil attached to one end, to record the variations of atmospheric pressure on a piece of paper. Other fluids beside mercury may also be used in iron tubes to obtain the same results. It has been suggested that this barometer may be employed in ships and in mines for signalizing dangers of atmospheric pressure, such as approaching wind storms on the ocean and the flowings of fire-damp in the mines. For this purpose this barometer should have a pointer of iron or some metal, insulated from the rest of the instrument, but in communication with one of the poles of a battery. The dial, over which the pointer has to travel, should be of glass or ivory, having metallic points inserted at those gradations which indicate dangerous variations of atmospheric pressure. These points being placed in communication with the other pole of a battery will, when the pointer comes into contact with one of them, close to the electric circuit, and operate a signal by an electro-magnet, and thus give sensible warning of approaching danger.

It is not a little remarkable that a similar instrument to the above was designed by an American in the early part of last summer. His invention was subsequent to that of M. Secchi, but was made without the least knowledge of the Roman professor's efforts. It will be observed by our readers that the foregoing barometer is similar in the principle of its operation to the one illustrated on page 52, this volume, SCIENTIFIC AMERICAN, but it is very different in its details. From the description given of it, some of our readers will no doubt be enabled to construct such barometers, and test their qualities.

The Decision in the Reaper Patent Case.

In our last issue we briefly announced the decision of the Supreme Court of the United States, between the rival inventors and manufacturers of reaping machines, Cyrus H. McCormick and John H. Manny, which was delivered by Justice Grier, as our paper was going to press. As then promised, we now lay before our readers the following abstract of the decision, embracing everything it contains of general interest:—

"McCormick charged an infringement of the fourth and fifth claims of his patent of 1845, and of the second claim of his patent of 1847, re-issued in 1853.

I. The first infringement charged is that of the divider—a part of the reaping machine which is of a wedge form, and projects in advance of the sickle, to separate the grain to be cut in the swath from that which is to be left standing until the next swath is cut. McCormick's claim to the divider, as set forth in his patent, is: 'Fourth, I claim the combination of the bow, L, and the dividing iron, M, for separating the wheat in the way described.'

For the purposes of this case, the divider, although a component part of the complex machine called 'the reaper,' may be considered by itself as a machine, or combination of devices, attached to the reaper to perform certain functions necessary to complete the whole operation. In order to ascertain whether the divider used by the defendants infringes that of the complainant, we must first inquire whether McCormick was the first to invent the machine called a divider, to perform the functions required, or has merely improved a known machine by some peculiar combination of mechanical devices which perform the same functions in a better manner. But if the invention claimed is only an improvement on a known machine by a new change of form or combination of parts, (and the evidence in this case shows it is nothing more,) the patentee cannot treat another as as infringer who has improved the original machine by the use of a different form or combination performing the same functions. The inventor of the first improvement cannot invoke the doctrine of equivalents to suppress all other improvements which are not mere colorable evasions of the first.

McCormick's claim is for the combination of the outside bow with an inside dividing iron of a certain form. This dividing iron is but a new form or substitution of that side of the wedge or divider, which in other machines performed the function of separating the inside grain, and raising it to the cutters and reel.

The machine constructed under Manny's patent has a wooden divider, somewhat in the form of a wedge, but it has no dividing iron, nor substitute or equivalent device possessing the peculiar qualities of that instrument. It more resembles the wedge in use before McCormick's patent of 1845, and is certainly no infringement of his claim.

II. The second infringement charged is that of the reel post, a standard on the end of the platform for supporting the axle of the reel immediately over the divider. McCormick's claim to the reel post, as set forth in his patent, is: 'Fifth, I claim setting the lower end of the reel post, R, behind the blade, curving it at R^2, and leaning it forward at top, thereby favoring the cutting, and enabling me to brace it at top by the front brace, S, as described, which I claim in combination with the post.'

Manny does not support his reel by a post, or use a brace; he uses a horizontal arm projecting forward from the back part of the frame. This device was used many years before McCormick's first patent of 1834. It is said to be superior to McCormick's braced post, and cannot be an infringement of McCormick's claim.

III. The third infringement charged is that of the raker's seat, which is claimed in McCormick's patent as follows: 'Second, And I also claim the combination of the reel for gathering the grain to the cutting apparatus and depositing it on the platform, with the seat or position for the raker, *arranged and located as described*, or the equivalent thereof, to enable the raker to rake the grain from the platform and deliver and lay it on the ground at the side of the machine, as described.'

By this device McCormick obtained a place for the raker over the finger bar just back of the driving wheel, and at the end of the reel, where he could have free access to the grain, and rake it off the machine at right angles to the swath. It was by limiting his claim to this arrangement, location, and combination that the complainant obtained his patent; and without this construction of it, the claim is neither patentable nor original.

The arrangement, combination and location of the raker's seat used by defendants has been patented to Manny as an independent contrivance and distinct invention. The place for the raker is obtained by a change in the shape of the platform, different from any before employed. It differs from the complainant's device in principle as well as in form and combination, and is, consequently, no infringement of his patent."

[Thus has terminated a suit which, if McCormick had been successful, would have subjected the "Reaping Machine" to his own private monopoly, and made him lord of the harvest. It is a matter of great individual hardship to Manny & Co. that they should have been compelled, in order to shield themselves from a grasping monopoly, to maintain, single-handed, a defence—expensive beyond example—in the most important patent suit, perhaps, ever tried in this country, while the benefits of their success will ensue chiefly to other manufacturers, whom the suit has not cost a single dollar.—EDS.

More Potash.

Potash, the type of all the alkalies, has of late years been rather scarce, and soda has, in a great measure, supplanted it, because soda is always obtainable from common salt, of which there is plenty both in the land and sea. But there are many processes where alkali is required, for which potash alone will do, as for instance, in the preparation and coloring of many fabrics; therefore it is with pleasure that we announce the discovery of a German chemist, Dr. Meyer, that the vast amount of the necessary alkali for ages locked up in the mineral, feldspar, can be made available. His method is, to calcine 100 parts of feldspar with from 140 to 180 parts of lime, either as hydrate or chalk; these are made into balls, and calcined in a suitable furnace, and afterwards the mass is powdered and heated in water at a pressure from 6 to 8 atmospheres. The potash can then be easily extracted, having been brought into a state in which it can be cheaply worked; and the crude mixture, with the addition of a little clay, furnishes an excellent hydraulic cement.

New Printing Press.

A new printing press has been invented and patented by T. S. Reynolds, of Athens, Ga., the improvements in which are, first, employing a rotating segment which receives the blank sheets of paper in combination with an intermittingly rocking bed on which the form is placed, and between which and the segment the impression is given. These parts are so arranged and operated that the blank sheets are properly presented to the form, the necessary impression given, the form remaining stationary a sufficient time to be inked, and the printed sheets allowed to be discharged from the segment by the most simple means.

Second, There is a novel inking device so arranged as to work automatically and conjointly with the segment and bed, the ink rollers passing over the form during the "dwells" of the bed, and properly inking it, and, during the movement of the bed, receiving the necessary supply of ink from the fountain through the medium of the distributing rollers.

Third, There is a novel method of counterbalancing the bed, whereby the counterpoise may be graduated as occasion may require, to compensate for the varying weight of different forms, and the bed is therefore equally balanced at all times.

Fourth, There is a guard frame to keep the sheets in proper position on the segment as they are carried around to the form.

Paddle Wheel.

Nathan Smith, of Berwick City, La., has invented a paddle wheel which is intended for stern-wheel boats, and the invention consists in fitting the two hubs carrying the two sets of arms of a paddle wheel to their shaft, and the attachment of the buckets to the arms of the wheel, in such a manner as to permit, at the pleasure of the pilot or other person, either hub and its attached arms to be turned on the shaft by the pressure of the buckets against the water, to enable the buckets to assume oblique positions, to exert a pressure on the water either in a direction laterally to the boat for the purpose of changing the course of the boat in either direction. There are also certain contrivances for the purpose of enabling the hubs to be released from the shaft, so that they may be capable of turning therein to change the position of the buckets, by the pilot or other person. It was patented this week.

Improved Breakwater.

Edward H. Tracy, of New York, has invented, and patented this week, an improvement in the above, which is designed to obviate the difficulty attending the washing away of the foundations of breakwaters. The invention consists in constructing the breakwater, dam, or other structure, with two or more longitudinal compartments, which may be subdivided into cells, and having inner compartments provided with a flooring, the outer compartment being open at its lower end, so that in case the filling of the outer compartment escapes in consequence of the washing away of the foundation directly beneath it, the structure will be retained or supported by the inner compartment or compartments while the front compartment is being re-filled, and until sufficient filling has escaped to form a good foundation.

Apparatus for Impregnating Liquids with Carbonic Acid Gas.

The object of this improved apparatus is to generate carbonic acid gas and charge liquids with the same in such a way that no gas can escape during the process, a difficulty that has hitherto attended apparatus intended for this purpose. The invention consists in attaching a bottle to a chamber, in the lower part of which a throttle valve is placed. The bottle contains the super-carbonate of soda and tartaric acid, from which carbonic acid is generally made by the addition of water; water is placed in the chamber which contains the valve. The whole is so arranged that the valve may be opened by the tilting of the water or acid chamber and the gas generated, and the liquid in the receiver charged without the least chance of gas escaping. It is the invention of Thomas Warker, of New York City, and it is patented this week.

Improved Hatchet.

N. F. English, of Hartland, Vt., has invented a hatchet having a claw hammer attached or combined. The invention consists in forming the claw on the upper side of the hatchet adjoining the eye, so that the face of the hammer and claw will have nearly the same relative position as in an ordinary hammer, thus rendering the implement much more serviceable than those hitherto produced. The claim will be found on another page.

New Smut Machine.

This invention consists in a peculiar arrangement of a fan, blast passages, scouring device and screens, so that the cleaning of the grain from smut and other impurities may be done in an expeditious and perfect manner. The inventor and patentee is Jeremiah Tobin, of Newark, N. J.