

## Science and Art.

## History of Reaping Machines.—No. 18.

On Jan. 15th, 1850, Homer Adkins, of Round Prairie, Ill., obtained a patent for a mode of giving motion to the cutter. For engraving of this machine see page 12, Vol. 5 SCIENTIFIC AMERICAN, and for claim see page 150 same volume, and for an extension of his plan of giving a reciprocating intermittent motion to the rake, to deposit the grain, after being cut, in regular bundles, see engravings on page 60, Vol. 6 SCIENTIFIC AMERICAN. On the same date of the above (15th of Jan.,) John E. Heath, of Warren, Ohio, obtained a patent for cleaning the teeth of the cutters from gum and dirt; the nature of the improvement consists in giving the cutters a larger vibration than ordinary, at suitable intervals, (see claim—same page as Adkins.) On July 20th, Hazard Knowles, of Washington, D. C., and H. C. Rivington, of Holmes, Ohio, obtained a patent embracing four claims, for rendering the cutters self-sharpening, for collecting and binding the grain in gavels after being cut, and for steering the machine. (See claims on page 342, Vol. 5, Sci. Am.) On the same date Jacob Pierson, of Wilmington, Del., obtained a patent for an arrangement of cutters bolted to an endless belt revolving in a vertical orbit on a guarded rail. (See claim same page as Knowles' and Rivington's.) On August 13th, John Hinton, of Pack's Ferry, Va., obtained a re-issue of his patent of May 22, 1849; (see claim, page 390, Vol. 5, Sci. Am.) On the 17th Sept., same year, Ebenezer Danford, of Geneva, Ill., obtained a patent for two sickles or cutters, moving in opposite directions—a shear cut; (see his claim on page 14, Vol. 6, Sci. Am.) In October following, Stephen Bowerman, of Detroit, Mich., obtained a patent for cutting corn stalks in the field by two rotating saw teeth wheels; on the same date J. J. Herndon, of Marlborough District, S. C., obtained a patent for a rice harvester; (see the claims of both patents on page 30, Vol. 6, Sci. Am.) On the 8th following, Geo. Hart, of Dillsborough, Ind., obtained a patent for a rotary cutter. On the same date, Edmund Quincey, of Lacon, Ill., obtained a patent for a rotary reaper also; (see the claims of both patents on page 38, Vol. 6, Sci. Am.) On the 15th of same month, Wm. Bailey Coates, of Big Lick, Va., obtained a patent for a hemp harvester, which embraces three claims; (see page 46, same Vol. Sci. Am., on which is also published the claims of Wm. Watson, of Chicago, Ill., for a corn harvester, which embraces the gathering, husking, and shelling at one operation). These comprise all the reaper patents granted in 1855.

## Soap.

The word soap or sope, from the Greek *sapo*, first occurs in the books of Pliny and Galen, and is, according to Dr. Gregory, derived from the German work *sepe*. Pliny informs us that soap was first discovered by the Gauls, that it was composed of tallow and ashes, and that the German soap was reckoned the best. According to Sismond's French historian, a soap-maker was included in the retinue of Charlemagne.

At Pompeii (overwhelmed by an eruption of Vesuvius, A.D. 79,) a soap boiler's shop with soap in it, was discovered during some excavations made there not many years ago.

From these statements it is evident that the manufacture of soap is of a very ancient origin; indeed, Jeremiah figuratively mentions it—"For though thou wash thee with natron and take thee much sope, yet thine iniquity is marked before me." (Jer. ii. 22.)

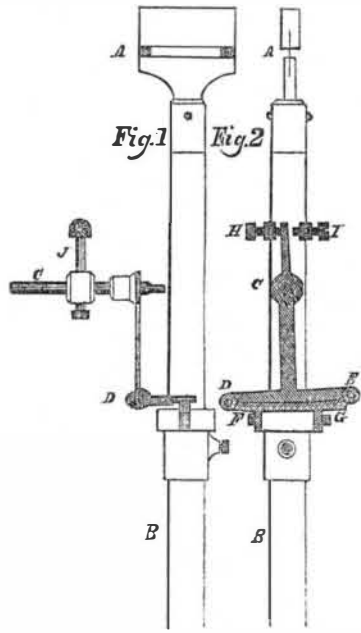
The primary soaps are divided into hard and soft soaps; the hard soap contains soda as the base; those which are soft are prepared with potash. These are again divisible into varieties, according to the fatty matter employed in their manufacture, also according to the proportion of alkali. The most important of these to the perfumer is what is termed curd soap, as it forms the basis of all the highly scented soaps.

SEPTIMUS PIESSE.

(For the Scientific American.)  
Brown's Pendulum Detachment.

The annexed figures represent a new pendulum detachment for church clocks, invented by J. R. Brown, of Providence, R. I.

Fig. 1 is a side, and figure 2 a front view of the upper part of a pendulum rod which is suspended by two springs at A. Similar letters refer to like parts.



C D E is the guide or crutch, shaped like an inverted T, and is placed back of the pendulum. It is fastened, as usual, to the pallet shaft, the center of which is at C. F and G are two pieces of steel, screwed one on each side of the pendulum parallel with the crutch and curved to correspond with a circle drawn from the point of suspension, A, as a center. At D and E, in the crutch, and perpendicular to it, are placed two square steel pins which embrace the arc, F G, in the same manner that the fork of the common guide takes hold of the pendulum. H and I are two screws attached to the frame of the clock, between which plays the piece, J, to serve as a guard to prevent the pallets from being thrown out of place.

OPERATION.—In figure 2, the pendulum is supposed to have finished its vibration to the right and is now returned towards D.

The arc, F, first strikes the pin, D, which unlocks the pallets from the escape wheel, causing the pin, F, to press upon the end of the arc, G, thereby giving impulse to the pendulum. But owing to the difference of the centers of motion of the pendulum and pallets, the pin, D, as it describes a smaller circle than the arc, F, soon escapes from it, leaving the pendulum entirely detached from the clock. Returning, the same operation is repeated on the other side. The locking surfaces of both pallets should be a very little under cut, to insure perfect freedom of the pins, D and E, from contact with the upper surface of the arc, F G, after the escapement has taken place. The different parts are so arranged that the escapement of the wheel and pallets, and that of the pendulum and guide, are made at the same instant.

A turret clock (built by J. R. Brown & Sharpe, in 1853, for the State of Rhode Island, and put up in the State House, at Newport,) with a two-second pendulum, whole length 13 ft. 5 in., has this detached escapement applied to it. The pendulum escapes from the pins, D and E, in 45 minutes of arc, or with two inches motion at its lower extremity. It vibrates  $3^{\circ} 54'$  with 28 lbs. falling  $4\frac{1}{2}$  inches per hour, which is  $5\frac{1}{2}$  times the angle of escapement. The friction of the train is 7 lbs.:  $10\frac{1}{2}$  lbs. falling  $4\frac{1}{2}$  in. per hour will cause the pendulum to vibrate  $56'$ , or  $11'$  more than is necessary to escape it. These observations were made before the outside dial work was applied; the distance from A to C, in this clock, is 10 inches, from C to D 5 inches, and from D to E,  $4\frac{1}{2}$  inches. Graham's dead beat or anchor escapement was used in this clock; concerning its performance, Job B. Wilbour, Esq., a watchmaker long resident in Newport, writes under date of Dec. 28, 1854: "Our clock performs most admirably; since I last saw you, which I think was about the 1st of Nov., it has been

running on mean time, notwithstanding the changes of temperature, and have no doubt it will continue to do so. I think it the most perfect time-piece in New England, and see no way to improve any part of the machinery."

The advantages of this detachment of this pendulum may be summed up as follows:

First, the pendulum is entirely disconnected from the clock, except at the moment of unlocking and impulse.

Second, the time occupied in giving impulse to the pendulum is much less than in the ordinary construction, by reason of the difference in the distance of the centers of motion of the pendulum and pallets from the place of action of the pins in the guide upon the pendulum, and by the great length of the arc, F G.

Third, the sliding of the locking surfaces of the pallets, against the ends of the teeth of the escape wheel, which occurs at every vibration in ordinary clocks, when the motion of the pendulum is any more than sufficient to escape it, is entirely prevented.

Fourth, the friction of the fork of the guide upon the pendulum rod, which takes place in common clocks when the centers of motion of the pallets and pendulum, are not in the same line, is nearly obviated.

Fifth, owing to the difference in the distances of the centers of motion of the pallets and pendulum, from the point at which the impulse is given, but about one-third of the motive power that would be required were they in the same line, is here needed.

Sixth, the teeth of the escape wheel can be made much shorter, and therefore lighter, as there is not so much strength required, which allows the escapement to be made with less drop, and thus effects a saving in motive power.

Seventh, the escapement is not liable to injury from any increase of motion which may accidentally or otherwise be given to the pendulum.

This escapement in the arrangement of the pallets and fork is somewhat like the lever escapement used in watches. The fork is, however, much wider in the former than in the latter, and there is also a great difference in the arcs of escapement of the pendulum and pallets in the clock, compared with those of the balance and pallets in the watch. Jurgensen, one of the best writers upon Horology, gives for the escapement of the clock pallets two degrees, for the watch pallets five degrees, and for the balance from the fork, twenty degrees. In the Newport clock the pallets escape in  $2\frac{1}{2}$  degrees, and the pendulum in  $\frac{1}{4}$  of a degree, allowance being made for drop. The angle of escapement of the pendulum can be reduced still further by shortening the distance, C D, or lengthening A C or D E. In an astronomical clock this might be desirable.

It is an established principle in clock-making that a long pendulum vibrating small arcs is best adapted for correct time-keeping, but nothing is more common than to see this entirely disregarded. As an example, the clock in the tower of the U. S. Arsenal, at Springfield, Mass., has a second's pendulum, 39.2 inches, the ball of which vibrates about 20 inches! L. S.

Providence, R. I., Jan., 1855.

[Messrs. Joseph R. Brown & Lucian Sharpe, No. 115 South Main street, Providence, R. I., are manufacturers of these movements, to whom address for further information.]

## Copper Ores.

A correspondent, P. C. Loveland, of Etowah, Cass Co., Ga., states that extensive copper ores exist in the vicinity where he resides, and that a fortune there could be made by a person or persons with capital, who understood the business.

The waters of the Upper Sacramento are teeming with the finest salmon, which are caught and carried to San Francisco, where they are sold at three cents per pound. So plenty are they that many spoil and are thrown away before being sold.

A tree weighing 700 pounds will absorb 15 pounds of water in six hours.

## Boat Guards.

A bill is now before the New York Legislature to compel all ferry companies to employ guard rails, operated in such a manner that persons will be prevented from attempting to jump on board after the boat has left, and from jumping ashore before the boat has struck the dock. A number of persons are drowned in this city every year, in attempting to jump on board boats after they have left their docks; this bill is intended to prevent such accidents.

## LITERARY NOTICES.

**AUTOBIOGRAPHY OF P. T. BARNUM**—We have just received a copy of this famous work from the publisher, J. S. Redfield, and as it has been very generally noticed in the public press, it is scarcely necessary to say, much of it by way of review. The author has passed through almost every shade and vicissitude of life, and is qualified by experience to pour a flood of light upon the numerous schemes and tricks which are always in full blast to "take in" the public. A good deal of discussion has taken place in the newspaper as to whether Barnum's Life is calculated to do good or injury; be this as it may, the life of such a character must of necessity afford interest to a very numerous class of readers, and we understand the work is having an extensive run.

**THE PRINCETON REVIEW**—The first number of this excellent religious and scholarly Quarterly, for 1855, contains a very beautiful memoir of the late Dr. Archibald Alexander. A very fine essay on recent works on Mental Philosophy, deserves to be read by every student. This Review is furnished to Theological students at \$2.25 per year, being only two-thirds of the subscription price. The office of publication is 265 Chestnut st., Philadelphia. The venerable Prof. Hodge, D. D., of Princeton College, is Editor.

**THE NAUTICAL MAGAZINE**—This excellent monthly magazine, by Griffiths & Bates, 79 John street, in its last number contains a fine article on the durability of and season for cutting ship timber, and in another it advocates the life boat principle applied to ships.

**THE COACHMAKER'S MAGAZINE**—The February number of this useful illustrated magazine, by C. W. Salades, Columbus, Ohio, contains two sheets of drawings of fashionable and improved carriages. This work should receive the patronage of all the carriage-makers in our country.

**FUTNAM'S MONTHLY**—This able and solid magazine for this month contains a fine sketch of Richard A. Kimball, author of Cuba. The first article is on the Diplomacy of Cannon Balls, and consists of a review of the present state of Europe, and the spirit of the different governments. It is a profound, fair, and manly essay. This magazine is entirely original, is a credit to the literature of our country, and its enterprising publishers, G. P. Putnam & Co., No. 10 Park Place, this city.

"The Medicinal, Poisonous, and Dietetic Properties of the Cryptogamic Plants of the United States," is the title of a large well printed pamphlet of more than 100 pages, by Francis Peyre Focher, M. D., of Charleston, S. C., so well known for his scientific qualifications, being a report made to the American Medical Association. It is replete with useful information; no physician can well do without it; it does great credit to the industry and learning of its author, to whom we tender our thanks for a copy.



## Inventors, and Manufacturers

The Tenth Volume of the SCIENTIFIC AMERICAN commenced on the 16th of September. It is an ILLUSTRATED PERIODICAL, devoted chiefly to the promulgation of information relating to the various Mechanic and Chemic Arts, Industrial Manufactures, Agriculture, Patents, Inventions, Engineering, Millwork, and all interests which the light of PRACTICAL SCIENCE is calculated to advance.

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