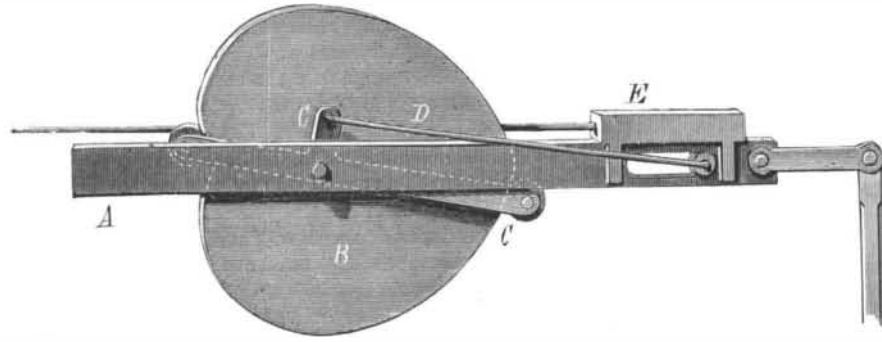


A SUBSTITUTE FOR THE CRANK.

The engraving shows a device recently patented by Mr. Samuel W. Hanson, of West Union, West Virginia, intended to replace the crank in steam engines and other machinery where the crank is now used. On the end of the shaft, in the place usually occupied by the crank, there is a heart cam, B, across the face of which, and at right angles with the shaft, a bar, A, slides in suitable guides. The bar carries a lever, C, whose pivot is parallel to the main shaft and in the same horizontal plane. This lever has at each end a friction roller which rolls on the periphery of the heart cam, and from one side of the lever projects an arm which is connected by a rod, D, with a pin working in a slot in bar, A. A slide, E, on the bar, A, is provided with two pins projecting downward on opposite sides of the pin connected with the rod, D. The slide, E, is connected with a hand lever, by which it may be moved lengthwise on the bar, A.

The bar, A, is connected with the piston rod of a steam cylinder or any other prime motor either directly or by means of a lever. The bar being reciprocated exerts a pressure on the periphery of the cam through the medium of the lever, C, and its rollers. It will be noticed that one end of the lever, C, is below the center line of the bar, A, while the other end is above. This arrangement insures the rotation of the cam in one direction, and to reverse the motion of the cam all that is required is to reverse the position of the lever, C, by moving the slide, E.

The inventor claims that the cam has no dead points, that the power and motion are equal throughout the stroke, and that for this reason a flywheel is unnecessary. He also states that he gains a great deal of power over the crank, that it will run either very slowly or with any desired velocity, that it is capable of withstanding jars or shocks it is likely to receive, and is not liable to get out of repair. Further information in relation to the invention may be obtained by addressing the inventor as above.



HANSON'S SUBSTITUTE FOR CRANKS.

Tobacco Smoke Products.

MM. Le Bon and Noel presented, the other day, in the French Academy, three flasks containing the following products extracted from tobacco smoke: 1. Prussic acid; 2. An alkaloid of agreeable odor, but dangerous to breathe and as poisonous as nicotine; 3. Aromatic principles still undetermined, but contributing, with the alkaloid mentioned, to give tobacco smoke its perfume. The alkaloid in question is thought to be identical with a compound—collidine—the existence of which has been observed in distillation of various organic substances, but whose physiological and toxic properties have been overlooked.

IMPROVED BOOK-RACK.

A novel book-rack which can be readily changed into a book-rest is shown in the engraving. It is designed more particularly for application to church pews, but there are numerous other uses to which it may be applied with advantage.

Fig. 1 is a perspective view showing the device when used as a book-rack, and Fig. 2 is a vertical transverse section showing the device in use as a book-rest. The front of the rack is pivoted at the ends so that it may be readily arranged either as a book-rack or book-rest.

On the inner surfaces of each end piece there is a latch which is adapted to hold the front of the rack securely in either of its positions. Ordinarily the front of the rack is in the position shown in Fig. 1, but it may be instantly changed to serve as a book-rest by raising the latches at the ends and turning the front of the rack on its pivots and bringing the latches against the upper edge of the front piece. The ends of the movable piece are rendered noiseless by rubber washers. The rack is neatly made in suitable designs and of suitable wood to match its surroundings, and it is readily secured in its place by two ornamental screws. It may be made in different lengths and widths to suit the different uses to which it is applied.

Further information in regard to this invention may be obtained by addressing the patentee, Mr. James Murphy, of San Antonio, Texas.

New York City as a Summer Resort.

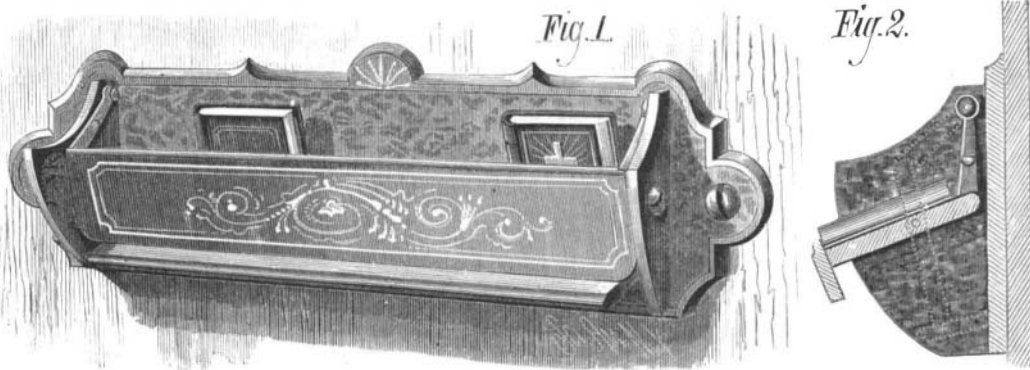
Compared with other cities which furnish tables of mortality, New York may claim a condition of public health better than the average. In the latest published returns for June the weekly statement for New York represents an annual death rate of 23.5 per 1,000 inhabitants. But in Concord, N. H., it was 26; in New Bedford, Mass., 34.7; Marblehead, Mass., 27.8; Sing Sing, N. Y., 62.6; Plainfield, N. J., 26; Wilmington, Del., 26.6; Baltimore, Md., 25.7; Cincinnati, Ohio, 24.7. These are localities generally deemed healthy,

and would probably resent the insinuation that a residence there is less conducive to longevity than one in New York. But here are the best and freshest figures we have at hand, and they tend to confirm that impression. Going well South we come upon statistics exhibiting even a more favorable contrast for New York. The death rate of the District of Columbia for the period mentioned was 29.4; Norfolk, Va., 29.4; Charleston, S. C., 32; Savannah, Ga., 31.4; Augusta, Ga., 29; Selma, Ala., 44.2; New Orleans, La., 37.2; Brownsville, Texas, 28.4; Nashville, Tenn., 32.4; Clarksville, Tenn., 43.4. A heated term in those cities, such as is scourging the Northern and Eastern States at the present time, would probably raise these percentages. New York need not fear to challenge comparison with foreign cities. She is the healthiest of all the crowded centers of population from which we have the tabulated returns, except London. The British metropolis reported a death rate of 18.5. But in Berlin it was 26.6; Hamburg, 25.4; Vienna, 25.8; Budapest, 41.1; Copenhagen, 25.8; Stockholm, 35.9; Geneva,

25; Amsterdam, 28.5; Rotterdam, 29.8; Cadiz, 32.9; Havana, 43.5; Shanghai (the foreign settlement), 104.4; and Kobe (Japan), 34.9. In Liverpool the rate was 23.4, closely approximating that of New York, and in the other large English towns it was but slightly less. These figures are fairly taken from the official data, and their accuracy cannot be impeached. They make out New York, if not exactly a grand sanitarium, yet a place where one's chances of health are good enough to warrant the selection of this city as a reasonably safe resort for the summer months—in fact, a good watering place. So it is regarded by the thousands of Cubans and South Americans who come here to pass the hot weather. For this comparatively salubrious state of things we have to thank our natural environments of ocean and rivers, owing little to the city authorities. If they would keep the streets clean and suppress some of the still flourishing nuisances so prejudicial to the public health, they could reduce the death rate still further and make New York uncontestedly the healthiest of the great cities of the world.—*New York Journal of Commerce.*

Measuring the Velocity of Light.

Professor Newcomb is engaged at Fort Whipple experimenting with the velocity of light. The distinctive feature of his method is a four-sided revolving mirror erected upon iron pillars. The mirror revolves at from one hundred and



MURPHY'S BOOK-RACK AND BOOK-REST.

fifty to two hundred and fifty revolutions a second. The light reflected from an ordinary mirror outside is forced through a tube which strikes the revolving mirror and is reflected across the Potomac River, a distance of two miles, where it strikes a mirror on Observatory Hill. It is reflected back again, and the point upon which it strikes is noted by a telescope attached to a graduated scale. By this means the exact time is easily secured, and arrangements are being made by which the velocity can be noted at much greater distance. The new station will be near the Government Insane Asylum.—*Washington Star.*

DANGERS OF ELEVATED RAILWAYS.—In this city recently, on the Metropolitan Road, a locomotive and an empty passenger car were, by some stupidity of the train men, backed off the track and fell into the street twenty feet below. Fortunately no passengers were on board, the engineer and brakemen escaped, and no person was hurt.

MISCELLANEOUS INVENTIONS.

Mr. Mark L. Mount, of Pearsall's, N. Y., has patented an improved matched hook, made of two parts, one of which carries a square stemmed pivoted button and locking springs, the other part being slotted to pass the head of the button.

A simple and convenient machine for cutting potatoes and other vegetables into uniform slices and strips has been patented by Mr. Jessup Whitehead, of Leadville, Col.

An improved adjustable attachment for carriages, which furnishes a good support for baggage, has been patented by Emma J. Osborne, of Anderson Court House, S. C. The invention consists in a frame or platform pivoted at its outer end between two arms, the inner ends of which are pivoted between two arms connected by a transverse rod and having the upper ends curved so as to form hooks, by means of which they are hooked on to the spring bar of the vehicle.

Mr. Daniel F. Hallahan, of Philadelphia, Pa., has patented a machine for trimming and burnishing the edges of soles of boots and shoes. It consists of two spiders of equal diameter and having an equal number of arms that are fixed upon a shank or shaft between two circular disks or guides, which guides are of slightly greater diameters than the spiders, together with the cutters or burnishers that the spiders carry on the ends of their arms; and it further consists of tangential cutters or burnishers (the cutters and burnishers being interchangeable) adjustably fixed upon the ends of the spider arms by means of screws that pass through slots in said arms, the spiders being so arranged that the cutters or burnishers on the one fit into or opposite the interspaces between the cutters or burnishers upon the other, and so that while one of the spiders remains fixed the other

may be approached or withdrawn from it, whereby the device may be adjusted and applied to soles of any thickness.

An improvement in extension settee tables has been patented by Mr. Morgan Gossett, of Russellville, Ohio. The invention consists of a table having stationary legs and a movable leg and a pivoted extension top that can be horizontally or vertically adjusted, as may be desired, by a novel arrangement of devices, while between the legs seats are arranged.

A car for transporting live stock by railway has been patented by Mr. Francis Rieber, of Callicoon Depot, N. Y. It consists in novel details of construction and arrangement of stalls, feed racks, water troughs, hay lofts, and water tanks, and devices connected therewith, whereby provision is made for securing the comfort and preserving the health of the animals occupying the car.

Messrs. Jacob A. Swinehart and Lafayette Jourdan, of Rushville, Ohio, have patented an improved drag sawing machine, which consists of a beam or bench supported at the rear by legs and in front by a guide block, which rests on the log to be cut. Two levers are pivoted in and extended downward through mortises in the beam, and are connected at their lower ends by a pitman, and to the forward one of these levers is pivoted the saw shank, the saw extending forward and through a cut in the guide block.

The curative properties of an electric current may be adapted to the treatment of different diseases by taking advantage of its different qualities as developed under varying conditions. The current may have great intensity and little quantity, or it may have great quantity and little intensity. It may be continuous or intermittent, or it may be made to alternate, so that electrical impulses of different name will rapidly succeed each other. There are two methods of generating electrical currents for curative purposes—one by chemical means, as in the various forms of battery, the other by the direct conversion of mechanical energy into electrical energy, as in the magneto-electric machine. Magneto-electric machines have not generally been considered as efficient for curative purposes as batteries, on account of the difficulty experienced in constructing a machine capable of yielding the different qualities of current required for the treatment of different subjects. Mr. Thomas W. Livingston, of Ainsworth, Iowa, has invented a magneto-electric machine capable of yielding currents varying in their character, so that its range of application will be wider than that of batteries, while it is more compact, more manageable, more easily adjusted, and operated by either skilled or unskilled persons.

VERY promising results are obtained with the eight-inch chambered rifle, converted from the old-fashioned ten-inch smooth bore, in the tests at Sandy Hook. The new gun bears a charge of 55 pounds of powder, carries a shot weighing 180 pounds, and penetrates 10 inches of iron at 1,000 yards. Originally, as a smooth bore, it was fired with 16 pounds of powder and carried a shot weighing 120 pounds.