

in such repute as in the United States of America. The laboring classes may be said to embrace the entire American nation. The American prefers the occupations in which the exercise of the brain is in greater demand than that of the elbow. His chief ambition is to attain to the position of a master workman."

**THIRTY-NINTH INDUSTRIAL EXHIBITION OF THE AMERICAN INSTITUTE.**

The Board of Managers of this association have issued circulars announcing their thirty-ninth exhibition, which will be held at the Empire Skating Rink, on the Third avenue, between Sixty-third and Sixty-fourth streets. The premises, lately enlarged and improved, will be opened for the reception of goods on Monday, August 29th, 1870, and on Wednesday, September 7th, the Grand Exhibition will be formally opened to the public by an address at 12 o'clock, M. It will remain open every secular day from 9 A. M. to 10 P. M., until Wednesday evening, November 2, 1870, when the closing address will be delivered, and awards to successful competitors announced.

Circulars containing full information may be had on application to the "Corresponding Secretary of the American Institute, New York," who will also send blanks and give any desired information to parties desiring to become exhibitors, and will receive and file all applications for space.

**CINCINNATI INDUSTRIAL EXHIBITION.**

This exposition will be held under the joint auspices of the Chamber of Commerce and the Board of Trade of the city of Cincinnati, and the Ohio Mechanics' Institute, commencing Wednesday, September 21, 1870.

It is the expressed desire of the managers to make this exposition of art and industry superior in point of attraction and practical benefit to all concerned, to any display of a similar nature which has ever been held in that city.

They hope to see art and mechanism fully represented. Steam power for driving machinery will be furnished. Any desired information will be obtained by addressing the "Secretary of the Cincinnati Industrial Exposition," who will furnish rules and blank applications for space.

**NEW MECHANICAL MOVEMENTS.**

On page 192, present volume, we gave the following problems for solution:

**"PROBLEM 1.**—Required to convert the rotary motion of a pulley into a horizontal intermittent rectilinear motion, first in one direction and then in the opposite direction, without the use of a pitman, pulley, toothed wheel, cam, cam groove in a pulley, or a flexible band, the first rotary motion to be constant and uniform. In other words, let it be required to move a piece of metal, wood, or other material, to a certain point where it shall pause, and then again move on a certain distance and again pause, and so on successively as far as desired, when it shall return to the point from which it originally started in the same intermittent manner and under the conditions above specified.

**"PROBLEM 2.**—Required to produce a variable rotary motion in a shaft driven directly by a belt from a pulley having a uniform constant rotary motion, without the use of anything but the one belt and the two pulleys; no cone pulleys or their equivalent to be allowed. All the motions to be continuous and in the same direction.

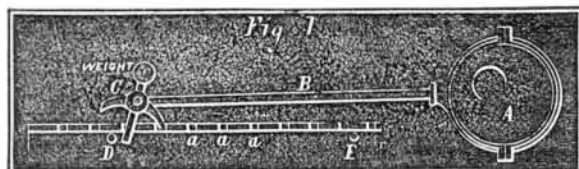
**"PROBLEM 3.**—From a reciprocating body to communicate reciprocation to another body, so that the second shall make four reciprocating movements for every reciprocation of the first; the motions of these bodies to be in lines parallel to each other, and the pieces to be connected by only three moving parts, which parts shall be neither wheels nor pulleys of any kind, and no inclined planes, cams, belts, or flexible cords, cranks or bell cranks to be allowed, and no radial motion from a fixed center in any piece employed."

We are happy to announce that each of these problems has received a correct solution, and we have engraved some which could hardly be understood by a mere verbal description.

Problem 1 seems to have received the greatest share of attention, and we have received a number of solutions which do not comply with the enunciation of the problem. One of these is, however, sufficiently ingenious to be noticed, notwithstanding it is an

**IMPERFECT SOLUTION.**

"An eccentric pulley is allowed in the solution of Problem 2, page 287, Vol. XXII., SCIENTIFIC AMERICAN, and I there-

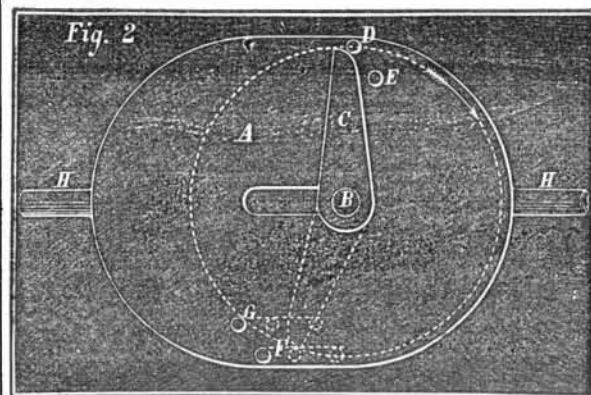


fore use one, A, in solution of Problem 1. Yoke this eccentric pulley to a rod, B, in the usual manner; on this rod is the simple double pawl, C, which engages in the notches, a, a, a, etc., and gives horizontal, intermittent, rectilinear motion in one direction as above. At the next stroke of the eccentric, a pin at D may trip the pawl, and we will then have horizontal intermittent motion in the other direction, until another pin, say at E, again reverses the motion.  
Salem, N. C. J. W. FRIES."

We consider this solution faulty because the eccentric may be regarded as the equivalent of a crank in this instance, and if so regarded, the rod, B, is the equivalent of a pitman. The latter is not allowed by the conditions of the problem.

**TRUE SOLUTION OF PROBLEM 1.**

"A, Fig. 2, represents the piece that has the intermittent, rectilinear motion, sliding with the rod, H. B is the shaft having the constant uniform rotary motion, and carries with

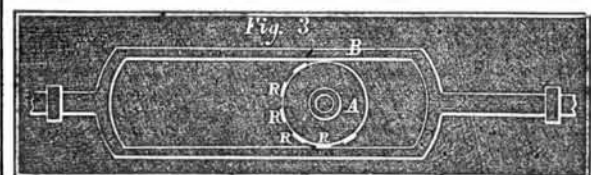


it the wiper, C; this successively engaging with the pins, D, E, F, G, imparts the motion required, the number of intermissions being varied with the number of pins. I have made a model of this movement, and it works in all respects as described.  
Wm. M. MOORE."

Niles, Mich.

**SECOND SOLUTION OF PROBLEM 1.**

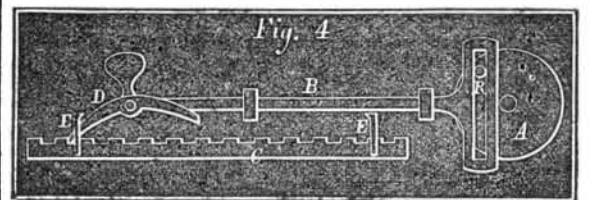
"The wheel, A, Fig. 3, is the given pulley, having a uniform rotary motion. R, R, represent rubber pieces fastened upon



one half of its perimeter, the action of which upon the yoke, B, will produce the intermittent reciprocating motion required.  
Toledo, Ohio. COURTNEY HEATH."

**THIRD SOLUTION OF PROBLEM 1.**

"The following is another form of movement, which I believe to be a true solution of problem 1. The given pulley, A, Fig. 4, carries a wrist, R, which works in the slotted yoke,



B. The end of the arm, B, carries a double pawl, D, which works in the rack, C. E, E, are stops for removing the pawl, D.  
IBID."

**PROBLEM 2.**

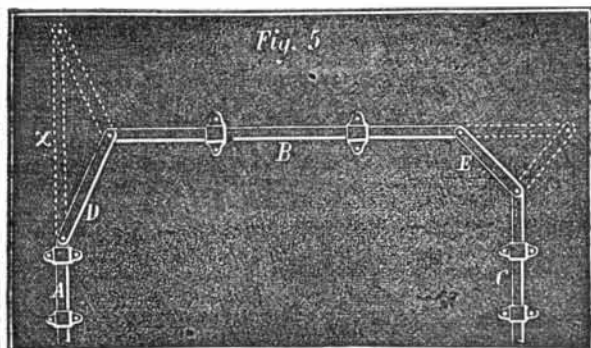
Several solutions have already been published for this problem, see page 287. E. A. T. of Philadelphia, Pa., sends still another, which we are inclined to think is not new, but will nevertheless give it. It is simply two eccentric pulleys of equal throws, connected by an inelastic belt.

**PROBLEM 3.**

But one solution for this problem has been received that can be accepted as new, and also as correct. The author of the movement, shown in Fig. 1, favored us with one, but it has a radial movement from a fixed center in one of the pieces, which is not allowed in the specified conditions.

**TRUE SOLUTION OF PROBLEM 3.**

The bar, C, Fig. 5, is the body required to make four reciprocations, while the bar, A, makes one. Move the bar, A,



up to the point x, and the bars, B and E, will take the position shown by the broken lines on the right. The bar, C, will have made one whole reciprocation. Continue the motion of A to the position shown by the broken lines on the left; C will then have made two reciprocations. Move A back to its original position, and C will have made four reciprocations, while A has made but one. This beautiful link motion is the invention of the author of the movement shown in Figs. 3 and 4.

**Sweet Potato Experiments.**

The *Western Rural* states that Colonel Baylor, of Georgia, aided by some scientific gentlemen in Boston, has been for some time conducting a series of experiments upon the sweet potato. The articles produced are starch, dextrine sugar powder, a sweet kind of vegetable flour. It is said that there is a variety of sweet potato cultivated in the Southern States which will yield ten per cent of cane sugar.

It is estimated that the sweet potato crop of Georgia, properly manufactured for commercial purposes, would add from \$10,000,000 to \$15,000,000 to the wealth of that State. The

value of the manufactured crop in North Carolina would exceed this sum.

**PATENT OFFICE AFFAIRS.**

The business of the Patent Office is now in a flourishing condition, and the present is a favorable time to enter applications. Inventors will find the SCIENTIFIC AMERICAN PATENT AGENCY ready to attend to the prosecution of claims with the greatest dispatch. By reference to our register, we find that we have made upwards of twenty-four thousand preliminary examinations into the novelty of alleged new inventions. This great experience, together with the fact that a large proportion of all the business with the Patent Office, for the past twenty years, has been conducted through this Agency, suggests to inventors the surest and best means to secure their rights.

We give opinions free, and all we require is a rough sketch and description of the invention.

Inventions patented through this Agency receive notice in the SCIENTIFIC AMERICAN.

**MODELS.**—In order to apply for a patent the law requires that a model shall be furnished, not over a foot in any of its dimensions, neatly and substantially made. Send the model by express, prepaid, addressed to Munn & Co., 37 Park Row, New York, together with a description of the operation and merits of the invention.

**CAVEATS.**—Whenever an inventor is engaged in working out a new improvement, and is fearful that some other party may anticipate him in applying for a patent, it is desirable, under such circumstances, to file a caveat, which is good for one year, and, during that time, will operate to prevent the issue of a patent to other parties for the same invention. The nature of a caveat is fully explained in our pamphlet, which we mail free of charge.

**EUROPEAN PATENTS.**—Probably three-fourths of all the patents taken by American citizens in Europe have been secured through the SCIENTIFIC AMERICAN PATENT AGENCY. Inventors should be careful to put their cases in the hands of responsible agents, as in England, for example, the first introducer can take the patent, and the rightful inventor has no remedy. We have recently issued a new edition of our Synopsis of European Patent Laws.

All communications and inquiries addressed to Munn & Co., respecting patent business, are considered as strictly confidential.

**Death of Mr. Dickens.**

As we go to press the telegraph brings us news of the death of the great novelist, Charles Dickens, than whom no writer of his time has become more widely known and admired. The writings of Mr. Dickens have all been in the interest of humanity, and no more fitting epitaph could be engraved upon his tomb than

"Write me as one that loved his fellow man."

His death will be lamented by the intellectual and the good of both hemispheres.

AN express train on the Alleghany Valley Railroad, running at the rate of forty miles an hour, was lately brought up all standing against an obstruction on the track, consisting of rocks and dirt, the result of a land-slide. This train was fitted with Miller's platforms, buffers, and couplers. Notwithstanding the fearful velocity of the train no lives were lost, as the cars did not telescope, as ordinary fastened cars would have done under the same circumstances. Miller's inventions should be adopted on all railroads without delay. On the Missouri Pacific Railroad nineteen passengers were lately killed by the telescoping of the cars.

**HARD ON THE M.D.'s.**—Dr. Charles Elam has lately written a work in which he undertakes to prove, and asserts he does prove, that the practice of medicine of to-day is less efficient, performs fewer cures, and is less able to check disease than it was thirty years ago.

**Inventions Patented in England by Americans.**

(Compiled from the "Journal of the Commissioners of Patents.")

**PROVISIONAL PROTECTION FOR SIX MONTHS.**

- 1,237.—SUPPORTING AND GUIDING APPARATUS FOR MACHINES FOR SEWING BOOTS AND SHOES.—Daniel Mills, New York city. April 30, 1870.
- 1,255.—BUCKLES OR BALE TIES.—E. J. Beard, St. Louis, Mo. May 2, 1870.
- 1,257.—HOISTING MACHINE.—Henry Reedy, Cincinnati, Ohio. May 2, 1870.
- 1,261.—MACHINERY FOR PRINTING UPON SPOOLS FOR THREAD, ETC.—Ira Dimock, Florence, Mass. May 3, 1870.
- 1,286.—STEAM ENGINES.—Babcock and Wilcox, Providence, R. I. May 5, 1870.
- 1,324.—MACHINERY FOR KNITTING LOOPED FABRICS.—John Pepper, Lake Village, N. H. May 9, 1870.
- 1,325.—APPARATUS FOR ABSORBING THE OVERFLOW OF OIL IN HYDRO CARBON AND OTHER LAMPS.—L. E. C. Moore and J. S. Hamilton, Pittston Pa. April 27, 1870.
- 1,289.—SAVES, ETC.—T. Hyatt, New York city. May 5, 1870.
- 1,313.—STAMP.—Towle and Harding, New York city. May 7, 1870.
- 1,323.—NUT LOCK.—R. Rutter, Vallejo, Solano county, Cal. May 9, 1870.
- 1,335.—ILLUMINATING GAS APPARATUS.—M. H. Strong, T. Barbour, and C. C. Conner, New York city. May 10, 1870.
- 1,386.—BREWING ALE AND OTHER MALT LIQUORS.—James McC Boston, Mass. May 10, 1870.