

Improved Multiplying-power Machine.

The appended article is furnished by the inventors. "This machine consists in a combination of toggle joints and levers. A represents a platform; B a standard forming the fulcrum for the working beam, C. The rod, D, connects a large heavy fly-wheel, E, mounted on a shaft, F. The other end of this working beam connects by a rod, G, with a lever, H, forming a toggle joint which rests on the supporter, I. Its lower surface forms an inclined plane, which rests on a stud, a, projecting from the sides of the supporter, I. The rod, J, forms the connection between the supporter, I, and the lever, K. This lever connects by a rod, L, with the lever, M,

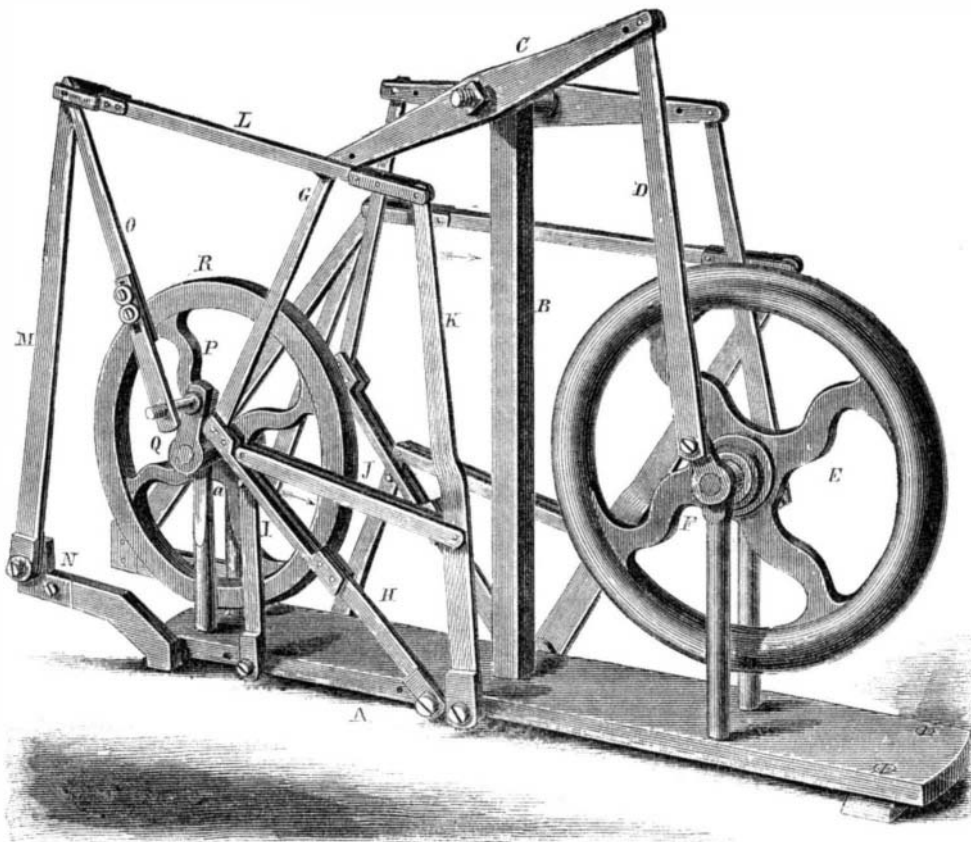
having its fulcrum on the end of the link, N. The rod, O, extends to the crank, P, secured to the shaft, Q, on which a second fly-wheel, R, is mounted. The rods, L and M, form a second toggle joint. This combination of the toggle joints and levers shows the remarkable property of gaining power and space at the same time, without loss of velocity, provided that all parts of the machine are in the proper proportion. Any moving force applied at the crank, P, of the second fly-wheel, R, brings the toggle joint, M L, out of its position, pushes the lever, K, forward in the direction of the arrow, sets the supporter, I, in motion, and raises the toggle joint, H G, and working beam, C, with constantly-increasing power, thus transmitting motion to the fly-wheel, E. The power gained by this machine is at the toggle joint, H G, equal to twice the force applied; at the lever, K, three times, and at the second toggle joint, L M, again twice; that is, in all, twelve times. Allowing one-third for friction, the gain in power is equal to eight times the force applied. By suspending weights from the fly-wheels on the model, it will be found that a weight of two ounces, suspended from the fly-wheel, R, is capable of balancing a weight of one pound, suspended from the fly-wheel, E, or eight times its own weight. This gain in power can be increased by the addition of toggle joints. The exact proportion of the space gained by this machine is, for all cases— $3.515 : 4.240 : 2$, or very nearly $3 : \frac{1}{2}$ —which formula cannot be explained at present for want of room. If the crank of the fly-wheel, E, has a length of 9 inches, the working beam must be raised 18 inches, but the supporter, I, has to travel only through a space of 12 inches; the lever, K, passes through 36 inches; the second toggle joint, M L, through 24 inches, and, consequently the crank of the second fly-wheel, R, must be only 12 inches long; that is, very little more than the crank of the first fly-wheel. From this it is evident that, by this machine, power and space is gained at the same time without loss of velocity, for as soon as the fly-wheel, R, is set in motion, the whole machine commences to work immediately.

"This machine can be used with advantage for increasing any motive power. For further particulars address the inventor, Henry Bickel, Elizabeth, N. J.

Cost of Stopping Railway Trains.

Much has been written about the cost of stopping a train of cars, from the great wear and straining of the machinery, rails and road-bed. A few years since the directors of a prominent railway became so impressed with the magnitude of the cost of merely stopping trains, that they discontinued several way stations where there was a very considerable traffic, withdrawing a good many trains from other stations, all to the serious inconvenience of the public and a

very considerable loss of traffic to the company. In a discussion at an annual meeting of shareholders of a company, the chief executive officer stated that in his judgment, it cost a dollar for every stoppage of a common passenger train, and for through and express trains a larger sum. A somewhat matter-of-fact shareholder entered into a computation of the number of stops made by the different trains on the road, and rather surprised the railway official by showing that the mere cost of stopping the trains of the road, according to the official estimate, was more than the entire gross receipts of the road for the year. This is what you may call running a theory into the ground with a vengeance. It is a very diffi-

**BICKEL'S POWER-MULTIPLYING MACHINE.**

cult and rather unsafe matter to estimate the cost of stopping a train of cars; but its difficulty does not seem to deter a great many persons from attempting it, and so we find different persons estimating it at from thirty cents up to two dollars per stop, all confident that they have found the exact sum. Any discussion of this matter, if it could be based upon exact facts instead of preconceived and erroneous theories might perhaps be valuable; but it seems rather difficult to get at facts, and our over careful directors and managers may take some comfort from the opinion expressed by the late Association of Railway Superintendents and Engineers of New England, who, after a long series of computations and observations, came to an almost unanimous opinion, that it would not cost, averaging all the railways and trains, more than 8 cents per stop. As the gentlemen who formed this association were careful and cautious in the statement of official opinion, and were certainly experts, in the best sense of the term, we think their evidence should hereafter prevent the propagation of the rather ludicrous estimates of men who have not made this and kindred matters a special study.—*Railway Times.*

Bandoline.

Many persons have a passion for smearing their hair with various substances so as to make it smooth and shiny. We give below a list of some compounds for this purpose which was published in the *Druggists' Circular*:—

1. Irish or Iceland moss, boiled in water, and the strained liquid perfumed.
2. Quince seed, $\frac{1}{2}$ teaspoonful; linseed, 1 tablespoonful, and a pinch of white mustard seed. Boil in a pint of soft water to half, and scent with oil of almonds.
3. Boil a table spoonful of linseed for five minutes in half a pint of water.

4. Isinglass, $1\frac{1}{2}$ oz.; water, 1 pint; proof spirit, 2 fluid ounces. Dissolve the isinglass in the water by heat, add the spirit, and scent with almond oil.

5. Tragacanth, 1 oz.; rose-water, 1 pint. Bruise the gum, digest for three days, and strain.

Any of these may be colored with cochineal if required.

Boot and Shoe Machinery.

We find the following letter in the *Shoe and Leather Reporter*:—

"I have been in the way of selling 'machine-made shoes,' both sewed and pegged, ever since they were introduced. And I have often asked myself the

question:—'Will the time arrive when the sewing machine will supersede the old-fashioned mode of hand sewing in shoe-making?' and as often have I answered the question, in my own mind, at least, 'No, never,' till the inventive genius of our machine makers shall produce a more perfect machine, or the operators acquire more skill in running it, and our Eastern manufacturers more moral and business honesty than to insert for the foundation of their shoes 'shoddy leather' and 'pasteboard' for an inner sole. So far as my business experience extends, four-fifths, at least, of the 'machine-sewed shoes' I have sold, the soles have ripped off from the upper, say in three weeks to as many months; and what makes it more unfortunate for the wearer, from the insufficiency of the inner sole, the shoe cannot be repaired, thus becoming a dead loss to the owner. It is a thing of almost daily occurrence, that I have shoes of this description

brought to my repairing shop to be mended, and what makes it infinitely more annoying, too frequently have to be subjected to hearing a string of curses, both 'loud and deep,' on the makers of such shoes."

INDUSTRIAL EXHIBITION IN GERMANY.

We are informed by Mr. Marsh, the American Consul at Altona, in Germany, that an international industrial exhibition will be opened at that place in June, 1866. A new system of awarding prizes will be adopted. Every machine will be practically tested, and a certificate issued to the inventor, owner or agent of each machine entered in competition, showing the comparative merits of the whole of the machines under trial in their several classes. Medals and diplomas will also be awarded to the best articles. There is also another feature of this international exhibition which adds to its general interest and makes it exceedingly attractive to American exhibitors; it is an exhibition of industry as well as agriculture and agricultural mechanics. Every article in use in rural housekeeping will be admitted at the Altona exhibition; also agricultural, horticultural and floracultural products; garden designs and lawn-furniture farm, dairy and cellar products, and cattle. The exhibition will remain open forty days. Those desirous of learning full particulars of this exhibition may address Mr. Louis Martin, care of Messrs. Austin, Baldwin & Co., 72 Broadway, New York.

THE work on the Pacific Railroad is progressing rapidly. The road will be completed to Topeka, 25 miles west of Lawrence, by the first of November.

THE *Great Eastern* was expected to sail with the Atlantic Telegraph cable on the 8th or 10th of July.