

Improved Converting Motion.

Many attempts have been made to overcome the supposed imperfections of the crank by annihilating its "dead points;" or rather to produce a motion which should more readily convert a reciprocating into a rotary motion or *vice versa*. The inventor of the device shown in the engraving believes he has succeeded in producing a combination free from the objections of others devised for this purpose, and possessing some advantages peculiar to itself.

Its principal parts are a movable or sliding double-toothed rack in combination with a segmental pinion and rotating cam. The rack-frame, A, has secured to it at one end the piston rod of the cylinder, B, and slides in the ways, C. As the piston is sent forward and back of course the rack moves

cluded to proceed as quickly as possible to apply the engine to our pumps."

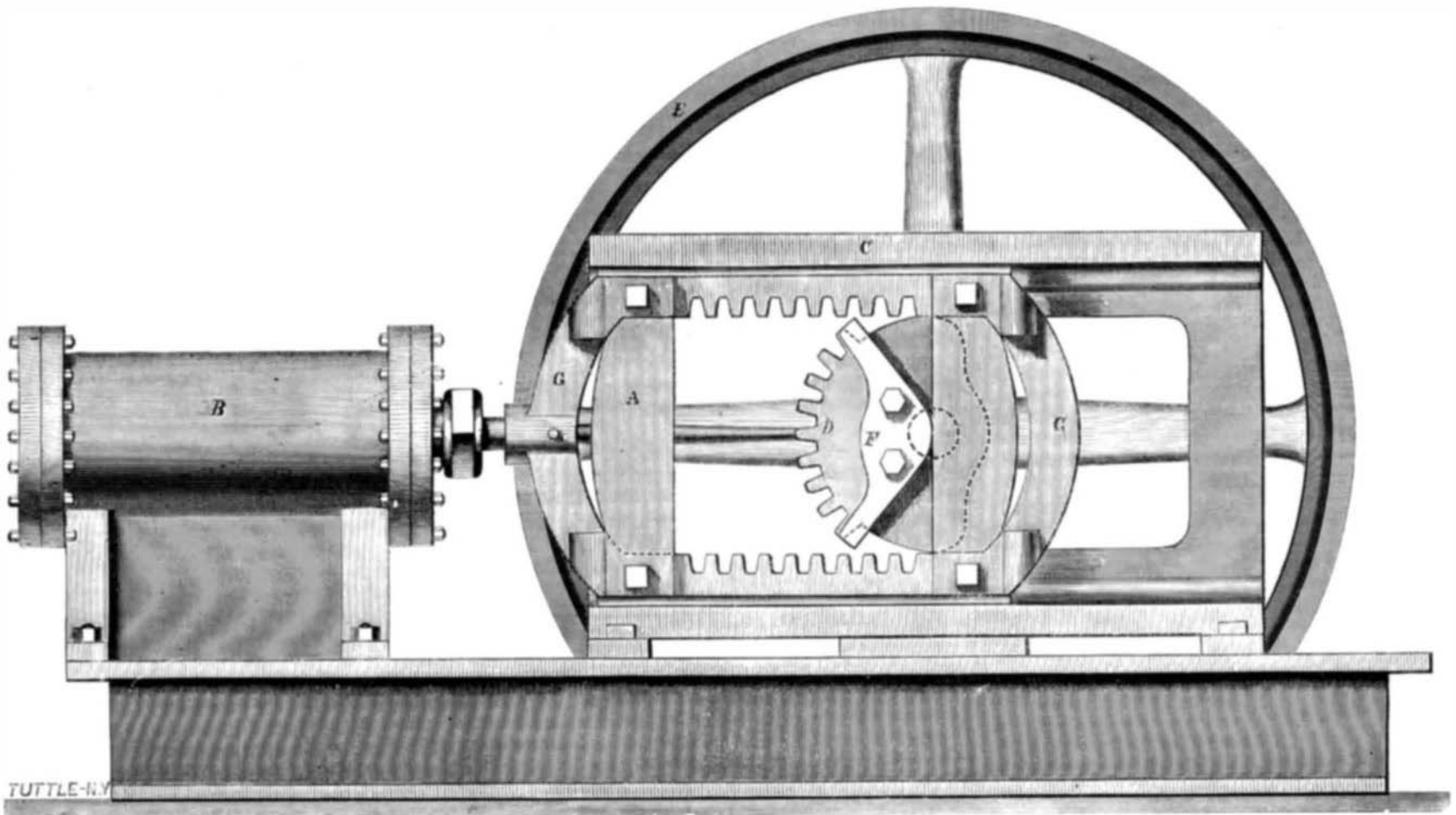
We think the matter of sufficient interest to engage the attention of our engineers and mechanics, and suggest that they give the machine an examination. It is running near Mr. Page's office, No. 69 West street.

Patented in the United States, August 14, 1866. Applications pending for patents in England, France, and Belgium, through this office. For further information address John B. Page, 69 West street, New York City.

Rapidity of Thought in Dreaming.

A scientific writer says that a very remarkable circumstance and an important point of analogy, is to be found in the ex-

which the fruit to be dried is spread. Around the top are flues, the side flues being open on their lower sides and communicating throughout their whole length with the interior of the case. The end flues are closed except at their ends, where they communicate with the side flues and with a central flue at their middle. By this arrangement of the flues it will be evident that the remote upper corner of the dryer will be heated equally with the more central parts, as the excess of heat will be drawn thereto by the natural draft through the end flues which open into the dryer at those points and which are the only outlets. Thus, the excess of heat and the exhalations from the drying fruits escape through common outlets to the outside. Also, by thus causing the redundant heat and vapors to pass off around and over the top of the



PAGE'S MOVEMENT FOR CONVERTING A RECIPROCATORY TO A ROTARY MOTION.

with it. Engaging with the rack, alternately at top and bottom, is the segment of a pinion, D, secured to the main shaft on which is the fly wheel, E. The outline of the pinion is denoted by the dotted lines. Secured to the pinion is a cam, F, which as either end of the frame, A, approaches the center, or the main shaft, comes in contact with the curved pieces, G, at the extremities of the rack-frame.

The operation of the engine is readily understood by reference to the foregoing explanation. The cylinder and steam chest is precisely like any ordinary engine, the other parts constituting the main differences. When the piston is moved by the force of steam in either direction, it carries with it the rack-frame, A, and the rack engaging with the segmental pinion, compels the shaft to make half a revolution. Part of this half revolution, however is made by the momentum of the balance wheel, as the pinion is toothed only about two-fifths of its circumference. As the rack reaches the end of the stroke the cam, F, rolls against the curved guides, G, and assists in throwing the rack in the other direction. We have seen a small engine work and found that its operation was very smooth, without jerking. How it will operate on a large engine remains yet to be seen. The object of the invention, and a most important one, is to dispense with the "dead points" of the crank and have a uniform leverage even to the end of the stroke. The inventor claims to have accomplished this end.

There is much disagreement among mechanics in relation to the loss of power in the crank. While some insist that this device for converting the reciprocating into the circular motion exerts its full force at only two points in an entire revolution, and that between these two points there is a constantly diminished force, others as strenuously assert that practically there is no actual loss of power. It must be admitted that theoretically the crank has a constantly varying power, and that its equable motion is due to the momentum of the fly wheel.

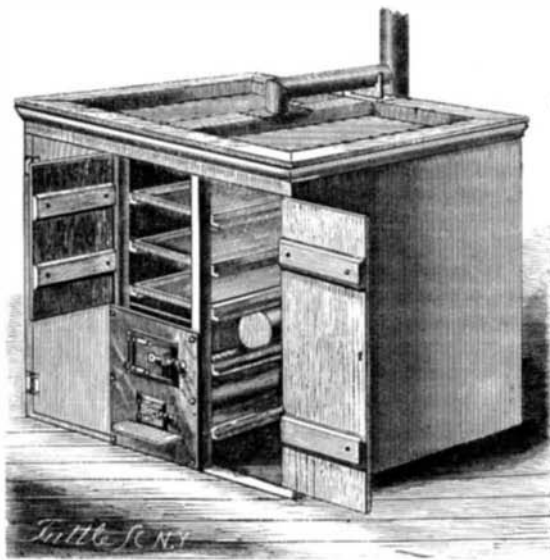
Mr. Page believes that a uniform leverage—that is a constant exertion of an equal amount of power at all points of the stroke—is better than the variable leverage of the crank, and that he has succeeded in developing a larger amount of power from a cylinder of a certain diameter with his improvement than is possible with the crank. He has experimented for years, and is satisfied he has greatly added to the power of the ordinary engine. For pumping purposes, especially, he claims a gain in actual performance of at least fifty per cent, and has demonstrated the fact to some of our best mechanics. The well known Woodward Steam Pump Manufacturing Company of New York have adopted Mr. Page's plan, and are about to apply it to their pumps. The President of the company in a note now before us says—'Thinking favorably of your patent engine, we have con-

cluded to proceed as quickly as possible to apply the engine to our pumps."

treme rapidity with which the mental operations are performed, or rather with which the material changes on which the ideas depend, are excited in the brain. It would appear as if a whole series of acts that would really occupy a long lapse of time, pass ideally through the mind in one instant. We have in dreams no true perception of the lapse of time—a strange property of mind—for if such be also its property when entered into the eternal disembodied state, time will appear to us eternity.

LEAVITT'S FRUIT DRYER.

The consumption of fruits in a dried, desiccated, or preserved state has become an important element in our economics. Improvements in the preservation of fruits and ve-



getables from season to season have made the business one of considerable importance and compelled the general use of fruits beyond their proper season. Dried fruits, not being subject to decay so readily as those which are preserved in sirups or in hermetically sealed cans, have become a favorite article of commerce and use, and any means which will save part of the time and labor necessary to prepare them for the market and thus reduce their cost is a public benefit. Such is the object of the apparatus shown in the engraving.

It is a cupboard-shaped box, having in its lower part a furnace in which a fire is kindled, the smoke of which passes off to the chimney by a proper flue. On each side and over this furnace are shelves either of pans or slats, removable, on

dryer, they add to the heating and drying capacity of the apparatus.

This device was patented May 14, 1867, by Charles Leavitt, Cleveland, Ohio, who may be addressed for further facts in relation to the invention.

Self-Detaching Car Coupling.

A trial of a new car coupling was made at Elizabethport, N. J., July 10th, on the New Jersey Central Railroad. The correspondent of the *Journal of Commerce* reports:—The coupling pins are hinged to supporting rods, which are free to slide back and forth in suitable guides, and are held in position by springs. The coupling pins are provided with shoulders that catch underlips or stops in such a manner that the cars cannot become uncoupled as long as all the cars remain on the track, but will uncouple on a car that is so far off the track that it cannot be jumped back into its place again by the headway of the rest of the train. The committee stood near the track, on which an obstruction had been placed to strike the third car in the train of an engine and six cars. The train passed at the rate of twenty miles an hour; the third car was displaced by the obstruction, but jumped back again on the track, the coupling remaining firm in its place. The obstruction was then increased and the train approached at nearly thirty miles an hour. The third car met the obstruction, and was thrown out of the track too far to be jumped back, the front and rear coupling detached, the car rushed down the embankment, while the engine with the two leading cars, and the two cars that had been coupled behind the third, traveled safely along the track with hardly a perceptible decrease in their rate of speed. Several similar tests were made, resulting with the same unqualified success.

A Historic Gun.

In a private letter received at the Bureau of Ordnance dated Paris, June 14, 1867, appears the following scrap of information respecting a gun with a singular history:

One of the first items of interest that I found here was the old 3-inch bronze gun that we fired at the Washington Navy Yard in 1856 or 1857. The same gun was fired at the Washington Arsenal by Major Bell in 1855, and the same year it went to England and was fired at Shoeburyness by the Ordnance Select Committee. After that it went back to America, and in 1858 it was sold to the Mexican Liberal Government. It is now placed at the entrance to General LeBruff's office (Commander-in-Chief of Artillery), as captured by the French at Puebla, Mexico, by Maximilian, and presented by the Empress to the French government. It has our name engraved upon it. I thought this item might interest you as it was in this gun the first firing was made with our projectiles before government.

Improved Air Cylinder Graining Machine.

While every other trade has had the benefit of the inventor's skill, the painter has been left to plod along after the manner of his father of the last century, doing his work in the slowest and most expensive method. In the graining machine we have, however, something that while it will lessen the cost of work to the consumer, will facilitate the task of the workman and render the work more satisfactory to both. Finishing interiors in imitation of woods, grained in oil colors, is in good taste and in harmony with all the prevailing styles of building. It would also be more economical than any other style of finish, were it not for the tediousness and difficulty of getting even a tolerable resemblance by the present method of hand graining. To meet these wants, the Air Cylinder Graining Machine has been invented and after many years of extensive experiment has been successfully adapted to all the grainer's uses. The machine is simple in its operation, rapid in execution, and true to nature. It reverses the common mode of graining, which is to spread the color all over the work and then to rub out the lights, a plan which requires not only a skilled hand and a practiced eye to determine the pattern, but also a deal of labor to wipe it out clean, upon which latter the excellence of the work depends. The machine patterns are obtained directly from the fiber of the wood, so arranged that they take up the color, transfer it to the work and produce the dark shading of the wood, leaving the lights perfectly clean. The machine is constructed of a vulcanized rubber cylinder, in combination with an elastic belt in which the figure of wood is cast. It is supplied with a feeding apparatus, and is so arranged that different bands representing various woods may be employed at pleasure. The cylinder can also be regulated to different widths of panels.

The ordinary graining colors are used. The machine will prove most useful and economical in many branches of manufacture. Owing to the elasticity of the air cylinder, convex, and even concave surfaces, when the depression is not too sharp, may be grained with as much facility as a flat surface. In many businesses where veneering is used solely for ornament and not for strength, the necessity for that tedious operation will disappear entirely, for as handsome exteriors can be produced by this machine on soft native woods, as are now obtained by the costly process of overlaying with expensive imported woods.

Indeed there is hardly a practical limit to the use of the machine, for its advantages are many and obvious. First, it does many times more work than can be done by hand. Second, it does not require skilled labor. Third, it produces work true to nature and uniformly true.

The machine is manufactured by Heath, Smith & Co., 282 Pearl street, New York, under the superintendence of the patentee, Mr. Adams. Messrs. H. S. & Co. will be happy to show parties interested samples of work done with the machine at their office.

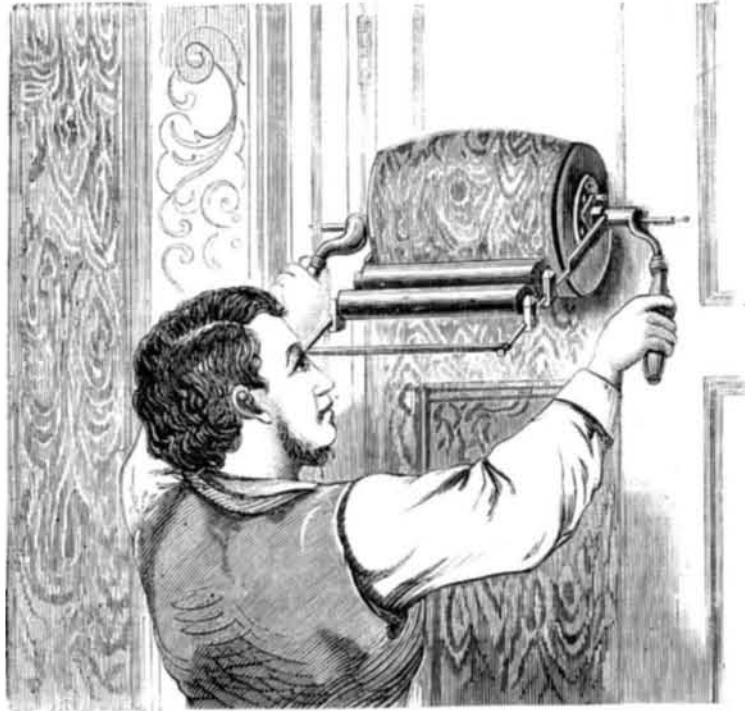
The Decline of British Skill.

The Philadelphia Ledger says that, under this heading, the London Review contains an article, the drift of which is not consolatory to British interests nor flattering to British vanity. Timely warning of shortcomings may, however, incite to proper efforts at amendment and arrest incipient decline. When, says the writer, we set the example in 1851, of those international competitions for the palm of excellence in works of art and industry, of which we have now an example in Paris, the last thing we should have feared was that the day would come when England would be beaten in a department which she had deemed especially her own. The superiority of her manufactures over those of all other nations was taken for granted as a thing that could not be disputed. But too great confidence has relaxed efforts at home, while all other nations have been pressing onward in the race with an energy not shown by England. Earl Grenville, at a distribution of prizes at the London University, quoted the president of the Civil Engineers in proof of the superior progress in machinery which has been made by foreigners. "He declared, on good authority, that greater improvements have been made in the manufacture of iron in France, Belgium, Germany, and Austria, than in England, and he assumed, upon general report, the fact that, except in the manufacture of furniture, glass, and china, we have made little advance in most departments of industry."

These statements find confirmation in the observation and inquiries of Dr. Lyon Playfair, who had just returned from Paris, where he had been acting as juror in one of the classes of the exhibition. There were many eminent men, of different nationalities, serving in a similar capacity, whose acquaintance he had made at the previous exhibitions of 1852 and 1862, whose opinions he tried to elicit on the present subject. With very few exceptions, he adds, there was a singular coincidence of opinion among these persons, that England had shown little inventiveness and made but little progress in the peaceful arts of industry since 1862. Mechanical and civil engineers lamented the want of progress in their own industries. Chemical and even textile manufacturers uttered the same complaint. Deserved stress is laid on the fact, and it is one which ought to serve as a lesson for our imitation in the

United States, viz: that France, Prussia, Austria, Belgium, and Switzerland possess good systems of industrial education for the masters and managers of factories and workshops, while England possesses none. It was stated to Dr. Playfair that technical education had given a great impulse to the industry of France. In this very exhibition, it was found on inquiry, that whenever anything excellent in French manufacture attracted attention, in the great majority of cases, the manager of the establishment producing it had been a pupil of the Central School of Arts and Manufactures.

On the other hand, it is alleged that England has been imperfectly represented in the Paris Exhibition. Who invented puddling? ask the champions of British inventiveness. Who invented grooved rolls? who first succeeded in substituting coal for charcoal? who suggested the live blast? who invent-

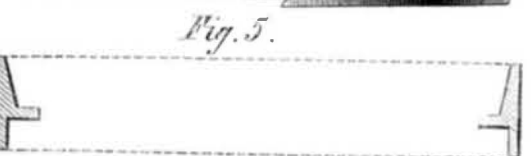
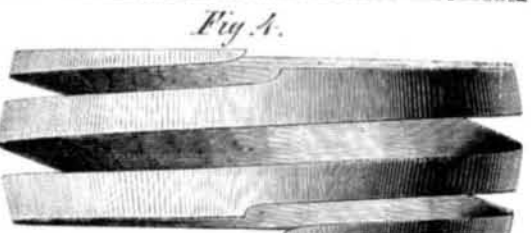
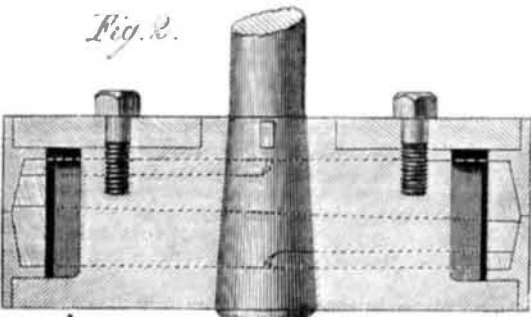
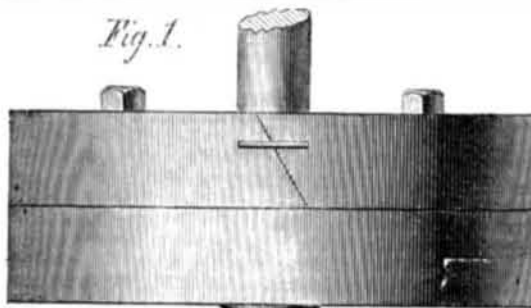


ADAMS' AIR CYLINDER GRAINING MACHINE.

ed the process of casting steel? have not mills been constructed in England which turn out sound armor plates of such enormous dimensions as even in 1860 would have been considered impossible? While admitting all this, the fact of the ascertained inferiority of British manufactures which have been exhibited, is still evident.

LOWE'S SPIRAL SPRING PACKING.

To utilize all the steam admitted to the cylinder of the engine and to equalize the wear of the piston, and diminish, or



at least, distribute the friction, are the objects sought by a number of different devices for the improvement of piston packing. That represented in the accompanying engravings

has the merit of novelty and differs in one important respect from any other which has come under our observation.

Fig. 1 is an outside view of the piston showing the two rings, which cover the edge surfaces of the piston head and follower. Fig. 2 is a sectional view of the piston, the dotted lines showing the spiral spring compressed between head, follower, and rings. Figs 3 and 5 are sections of the two rings, having inward projecting flanges, surfaced to the inside of the head and follower, and overlapping their edges, Fig. 4 is the spiral spring expanded laterally and vertically. This spring, it will be seen, is beveled on its face from the center to both edges, so that it may be readily introduced into its place. It bears on the flanges of the rings, keeping them in close contact with the head and follower, and its diameter is enlarged by the compression of the head and follower, so that it bears outwardly against the rings all around, keeping them out against the inner surface of the cylinder.

The inventor claims for this piston a greater contact surface, the whole thickness of the piston having an equal bearing, while a narrow packing tends to wear the cylinder unevenly; greater ease of taking apart, and more regular and efficient automatic action of the spring. It is evident that the extension of the rings over the edges of the head and follower is an advantage.

This device was patented Dec. 11, 1856, by Barker Lowe, Fall River, Mass., by whom all communications relative thereto will receive prompt attention.

SMITH'S IMPROVED EXTENSION LADDER.

This useful ladder will commend itself at a glance. The engravings show it in two positions, one closed and one extended. It can be used in all situations where the ordinary step ladder is used, and thus the advantage of being easily adapted either to slight elevations or to a greater height, while it may be folded together as compactly as any now in use.



It is a double ladder, both the step bars and uprights, and each of these parts are attached to their mates by straps through which one slides, both being held securely by pins passing through one into the other, holes being made at convenient distances for this purpose. It may be either a low ladder of three steps or a high one of six, or of any degree of elevation between the two extremes. The cross bars between the upright and the steps may be adjusted instantly, to give greater or less spread to the base. For libraries, for papering or painting rooms, hanging pictures, picking fruit, and many other purposes this contrivance

will be found to answer all the uses of several ordinary step ladders, and will occupy no more space when not in use than one of half its capabilities.

It was patented through the Scientific American Patent Agency June 25, 1867, by Henry T. Smith. For further particulars address Smith & Schenk 183 Fulton street, Brooklyn, N. Y.

THE ACCELERATING GUN.

On our first page are engravings illustrating the description, by the inventor, of Lyman's Accelerating Cannon, which seems to promise considerable changes in the form and operation of rifled guns. From this account it will be seen that its performances are much superior to the ordinary rifle, while the destructive strain upon the barrel is much less. It has been thoroughly tested and has received the unqualified commendations of many of our best ordnance officers, the principal objection urged being that its use would render all present means of defense by armor almost valueless. However this may be, it would seem that its powers must greatly exceed those of the single charge piece.

We hope our government will extend facilities to Mr. Lyman for the further testing of the practicability of the invention.