

# SCIENTIFIC AMERICAN

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A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES.

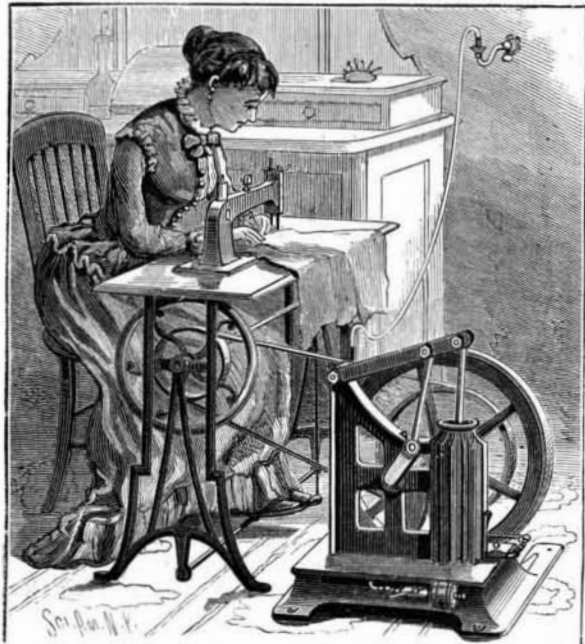
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## Mechanical Criticisms.

Inventors or improvers sometimes prefer to allow their work to die before them, or to permit others to capture and re-enforce their ideas, rather than to make their work patent—or known—when by the laws of the country they would be defended against all meddlers. The surest way to a certain control of an improvement or the credit of an



SEWING MACHINE DRIVEN BY GAS MOTOR.

invention is to have it registered either by caveat or by the emission of letters patent. The man who would introduce a new mechanical device to the world makes a great mistake when he attempts to avoid criticism. For criticisms are not always unfriendly. The discussion of new inventions in the mechanical societies, while being very pointed and extremely critical, are of the most friendly nature. The very force of these discussions rests in their tendency to discover defects in methods and in the application of scientific principles.

The *Industrial World* says that "instead of sitting down to mope in anger over these animadversions, the inventor proceeds, if possible, to remove the cause which occasioned them. Thus, a rival has often unconsciously injured himself by attempting to injure his competitor, because he has suggested needful improvements in the other's journal. This rule holds good in the mechanical world. A rival says a certain machine is not good because it does not perform certain functions. The maker or inventor says, 'I will remedy this defect,' and proceeds to do so. The critic has helped to perfect the other's invention."

## Barbs in Beef.

There is a fight going on in Chicago between the shippers of beef on the hoof and beef *per se* to the Eastern market. And as the shippers of dressed beef seem to have the encouragement of the market, the shippers of live beef appear to take advantage of every opportunity to decry the dressed beef enterprise. One of the queerest attempts to bring the dressed beef business into popular disfavor is the publication of two cases of injury to eaters of the beef by the swallowing of tag hooks affixed to the beef. These tag hooks are simply bent staples, three-quarters of an inch wide, and with prongs five-eighths of an inch

long, used to secure the direction tags to the quarters of beef. The statement is that, in two weeks, two women residing in different parts of Philadelphia had swallowed these barbs in cooked beef, and both of them, by a curious coincidence, went to the same physician for relief.

Until further developments and other physicians are heard from, the impression made by these instances will be that the women must have had mouths like ostriches, and forgot to chew their meat.

## Effects of Electricity upon the Nerves and Heart.

Among the curious exhibits at the Munich Electrical Exhibition were a series of photographs representing the various changes and contortions produced in the human face by subjecting the different facial nerves of a patient to the action of electricity. These were the experimental photographs made by Professor Von Ziemssen. The expressions of joy, pain, surprise, doubt, disgust, etc., were easily realized, according to the nerve that was touched by the electrode.

Other observations and experiments by Professor Von Ziemssen promise to be of great importance. They institute a comparison between the continuous and the induced current in the stimulation of the important accelerator and depresser nerves which control the heart. He has found that an induced current, so far from stimulating the nerves of the heart, as heretofore believed, is perfectly inoperative, whereas a continuous current from an ordinary battery is of the very greatest activity.—*Journal of the Telegraph.*

## MOTORS FOR SMALL POWER.

Regarding the desirability of a compact, simple, easily managed, and inexpensive motor, little need be said. The want of it is manifest in various branches of manufacture and in all small mechanical industries, and the fact that motors of this class are not generally in use indicates that for one reason or another the want has not been fully met.

Our engravings show a motor recently developed by the Economic Motor Company, of 28 Beekman St., New York city, which is well calculated to meet the requirements of power users needing less than two horse power. It is a gas engine, deriving its power from the rapid ignition of a com-

bustible mixture of illuminating or heating gas and air in the power cylinder. The gas and air enter the cylinder through valves that are entirely automatic in their action, and when the amount necessary to propel the piston has been drawn in the ignition takes place and the piston is pushed to the top of the cylinder, imparting rotary motion to the crank shaft and flywheel. The momentum of the



SMALL GAS ENGINE APPLIED TO PRINTING.

latter completes the revolution, driving out the products of combustion through the exhaust valve, when the gas and air enter as before and another ignition drives the piston up again, and so on as long as the gaseous fuel is supplied.

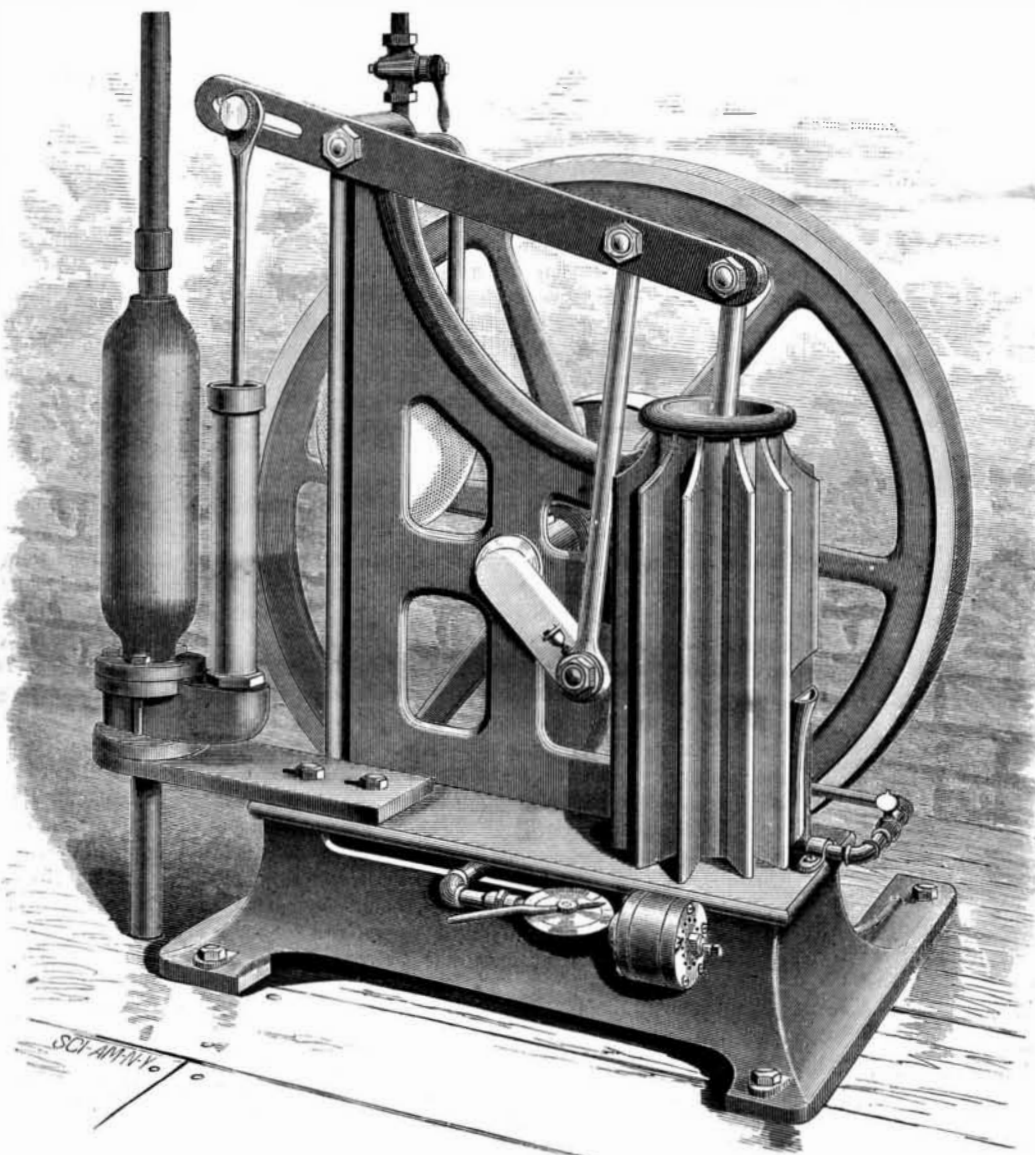
To start the engine it is only necessary to turn on the gas and light it at the ignition burner, and then turn the flywheel through a part of a revolution, when it moves on regularly. To stop the engine is simply to shut off the gas.

This motor requires no engineer to operate it, as any one can start and run it. As it can neither explode nor set fire to anything, it does not in any way affect insurance. No water is required in connection with it, and there is no expense attending bringing in the fuel. It produces neither ashes, dust, smoke, nor smell. It may be stopped or started as often as desirable, and when stopped expense ceases.

The one-half man power—the smallest size made—will run a sewing machine when taking its entire supply of gas through an ordinary six foot gas burner, and we are informed that for less than two cents per hour it will run two sewing machines, or a dentist's lathe, or other small machinery of a like character, or pump 150 gallons of water 50 feet high. The next size larger—one man power—is adapted to such work as running a foot lathe or scroll saw, dentist's machinery, foot power printing presses, pumping water, etc.; and a still larger engine—one-half horse power—is capable of running a small shop or three or four small printing presses, and is useful for hundreds of other purposes, which need not be named here.

This motor is patented in this country, also in England, France, Germany, Austria, Belgium, and Spain.

THE yield of the Pennsylvania coal mines last year reached the enormous amount of 80,000,000 tons.



ECONOMIC MOTOR COMPANY'S GAS ENGINE APPLIED TO PUMPING.