

vice either with hose connections to throw streams directly from the hydrants, or with steam connections, as desired.

DUTIES OF GASKILL ENGINES.

Place.	Capacity.	Duty.	Experts.
Saratoga, N. Y.	5,000,000	112,899,983	Prof. D. M. Greene, C. E., Troy, N. Y., and J. W. Hill, M.E., Cincinnati.
Saratoga, N. Y.	5,000,000	106,838,000	Chas. T. Porter, C.E., New York City.
Omaha, Neb.	5,000,000	102,000,000	J. D. Cook, C.E., Toledo, O.
Columbus, O.	10,000,000	115,400,000	T. C. Mendenhall, C.E., Washington, D. C.
Buffalo, N. Y.	15,000,000	125,907,297	Jno. W. Hill, M.E., Cincinnati, O.
Leavenworth, Kan.	5,000,000	110,478,000	Thos. J. Whitman, C. E., St. Louis, Mo.
Hyde Park, Ill.	12,000,000	110,600,000	Chas. Hermans, C.E., Louisville, Ky.
Lima, O.	3,000,000	110,482,946	J. D. Cook, C.E., Toledo, O.
Erie, Pa.	5,000,000	122,442,491	F. A. Scheffler, C.E., Erie, Pa.
Chicago, Ill.	2 12,000,000	102,000,000	Prof. R. H. Thurston, Cornell University, Ithaca, N. Y., Jas. N. Warrington, C.E., Chicago, J. S. Coon, C.E., Burdett, N. Y.
Philadelphia, Pa.	20,000,000	125,022,000	J. E. Codman, C.E., Philadelphia, Pa.

The principal office of the Holly Manufacturing Co. is at Lockport, N. Y., and its officers are: Hon. T. T. Flagler, president; H. F. Gaskill, vice-president and engineer; H. H. Flagler, treasurer.

Branch offices:

C. G. Hildreth, secretary; office 45 Broadway, New York City.

P. H. Linneen, western agent; office 51 Home Insurance Building, La Salle Street, Chicago, Ill.

W. E. Decrow, eastern agent; office 27 Federal Street, Boston, Mass.

Spontaneous Combustion.

The frequent occurrence of fires from spontaneous combustion has led us to more frequently refer to the subject in these columns than we should, were it not important to everybody to be constantly on the watch to see that the causes for these more or less disastrous fires do not exist on their premises.

A late number of *Stove and Hardware* gives a list of fires which have recently occurred from this cause.

In a manufactory of plane bits in Chicago, a sponge had been used to transfer the water by capillary attraction from a water box to an emery wheel, on which the bits were ground. The sponge wiped off the fine steel particles from the wheel, and they were collected in the cells of the sponge, and kept constantly wet. The sponge was finally laid aside, and after a week or ten days it was discovered that the mass was spontaneously ignited, and if it had not been for its timely discovery another mysterious fire might have resulted.

In a factory in New Jersey where oiled stock for planes was operated on by boring, planing, and mortising machines, causing shavings and fine particles of wood, which were saturated with linseed oil, to collect on the floors, it was noticed that a great increase in the temperature took place when the sweepings—which had been moistened by sprinkling—were collected in a

pile. On a subsequent occasion it was found that a barrel of shavings and chips from the boring and mortising machines were so hot as to be almost ready to ignite. Another barrel contained shavings made in planing oiled stocks. On these being moistened with water they soon began to heat, and the temperature continued to rise until the next day, when it was found that the shavings began to char. The barrel was covered with a metal plate until the next day, when, on being disturbed, the mass burst into flames.

A number of bales of Sea Island cotton stored in a warehouse in New Jersey were found to be on fire. When the fire was extinguished at one spot it would start at another. The cotton had been ginned on a roller gin, which, in cracking a portion of the seed, had caused the oil in the seed to become mixed with the cotton, and the result was spontaneous ignition.

In the manufacture of a cement or putty composed of whiting and boiled linseed oil, which, after being ground in a mill, was put in barrels, a fire was discovered under one of the barrels standing on end. The floor was partially burned through when the discovery was made. In grinding the oil the mass became warm from the friction, and a small part of the oil had leaked through the common barrels while in this warm state. It was discovered in time to prevent much damage.

An engineer placed a bunch of waste—which had collected in cleaning up a mill—in front of a boiler, in

magnets for each other, each time that a card is placed with its magnet in the base, the figure will turn round this axis and effect a series of oscillations round its own axis until the poles of the U-shaped magnet holder under its robe are opposite the contrary poles of the straight rod hidden in the card. If the base has been correctly marked previously, the divining rod will indicate the corresponding number of the answer. Any boy with a little genius and a few tools can make an oracle similar to our engraving.

The Cannon Ball in Therapeutics.

It is a very self-evident proposition in physics that a cannon ball, as ordinarily propelled, will, upon its abdominal impact, produce a movement of the bowels. Such a movement, however, is attended with the serious personal inconvenience of producing a large hole in an important portion of the economy. And it is not in this way that Dr. H. Sahli, of Bern (*Correspondenz-Blatt für Schweizer Aerzte*), proposes to utilize the cannon ball in therapeutics. He advises that it be simply rolled about upon the abdomen for five or ten minutes daily, in order to relieve habitual constipation. The weight of the ball should be from three to five pounds. In cold weather it can be covered with chamois or kept warm by the stove. Better still, according to Dr. Sahli, is the plan of having the patient take it to bed with him at night, and thus

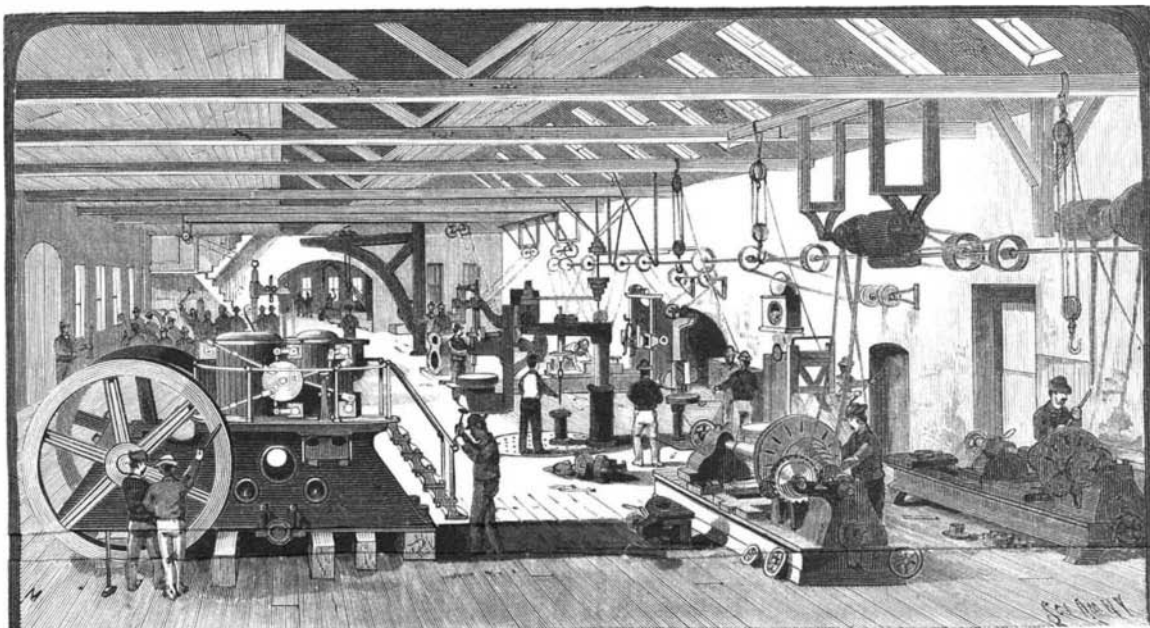
letting the missile of war warm itself ingloriously in the arms of the victim of colprostatitis. The best time to use the cannon ball is in the morning after waking. It is then to be made part of the morning toilet; the patient lying on his back in bed rolls his ferric bedfellow systematically over the abdomen. The direction is not of so much importance as that of systematically treating every part of the abdominal wall. Abdominal massage is acknowledged to be a useful measure in torpidity of the bowels, and Dr. Sahli assures his readers that by his method he has been able to cure nearly an or his cases without the aid of medication. Of course proper attention should be paid to diet and hygiene.

When universal peace

comes, the orator can speak not only of turning swords into plowshares, but also of cannon balls into aperients; while of Dr. Sahli it may be written: "Peace hath its victories, no less renowned than war."—*The Medical Record*.

Secure the Loose Joints.

The *Master Mechanic* thinks that engineers pay too little attention to the necessity of securely fastening the flexible parts in moving machinery that are liable to vibration. Such parts act like a cutting instrument, and eventually wear into each other and into the permanent structure. Not long since a locomotive could be seen, built by a builder of some reputation, where the cab sheet, not being fastened to the boiler, had cut about half way through the wagon top, almost rendering the boiler dangerous, and yet this locomotive had been built only a few years. The excessive noise about cars and locomotives renders the squeak and noise incident to such wearing unnoticeable. It therefore escapes attention until the damage is done. Often under new cars one can see loose rods bearing upon stay rods and trusses, without sufficient fastening to firmly hold them from



THE OLD ERECTING SHOP.

order that the fireman could use it the next morning in starting up the fire. During the night it spontaneously ignited, set fire to the kindlings which had been made ready for the morning, raised steam sufficient to blow off and alarm the watchman.

Some years since a gentleman was experimenting in coloring Southern moss for decorative purposes. In one of his experiments he used a very thin paint or varnish, but slightly colored with a pigment. He dipped the moss in the mixture, and then squeezed out as much as possible by hand. The result not proving satisfactory, he threw the moss in a box and placed it in a closet. A few days after, the odor of something burning led to the discovery that the moss was charred, and almost ready to ignite.

A SCIENTIFIC TOY.

The toy shown in the subjoined figure, taken from *La Nature*, although far from new, is nevertheless ingenious, and cleverly modernized by the constructor. This is the way to make the oracle speak; we will afterward give the secret of its accurate answers. We write upon 12 prepared cards a series of questions relating to history, geography, science, customs, etc. One of the company takes one of these cards at random and reads one of the questions; then the card is placed under the magician's feet, in a groove made to receive it. Immediately the oracle turns on its axis, and after some oscillations becomes fixed in a certain position, its magic wand pointing to one of the numbers by which it is surrounded. On referring to the corresponding number on a list, we read an admirably exact and accurate answer.

We may see that by varying at will the cards of questions and answers we may obtain from the oracle an indefinite number of replies. Nothing could be simpler than the process by which this result is obtained. The base of the toy, into which the cards slip, bears a vertical pivot on which rests the body of the magician, whose robe conceals a vertical U-shaped magnet, having its two poles near the base, as shown in Fig. 2.

In each of the cards there is another magnet concealed, a straight rod, occupying a different position for each of the 12 cards. We see that in virtue of the well known laws of the attraction of

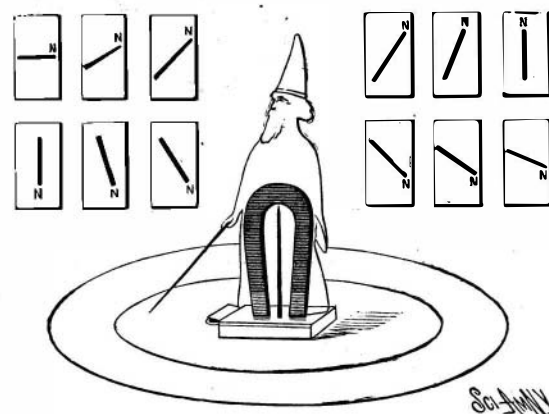


Fig. 2. DETAILS OF THE MAGNETIC ORACLE.

vibration. If the louder noises and sounds about cars and locomotives could be silenced, the magnitude of the squeaking and grating sounds would be surprisingly apparent.



Fig. 1.—THE MAGNETIC ORACLE.