

for a patent for a lamp is already before the Commissioner, and is taking its regular course. According to the rules of the Patent Office nothing concerning it can be divulged. It is understood, however, that it is progressing favorably. Mr. Edison has already received seven patents bearing on the electric light, and has filed three caveats. Five more similar applications are now under way. He has had a man in the Astor Library searching the French and English patent records and scientific journals, from the earliest dates down to the past fortnight, and says nothing like his arrangements has been revealed.

Mr. Edison is making elaborate preparations to introduce and experiment with the electric light. He purposes to commence at Menlo Park with 2,000 lights, using telegraph poles with 15 lights on each arm. This experiment, including the cost of the buildings, engine, generating machines, and everything, is estimated at from \$100,000 to \$125,000.

SPREADING DIPHTHERIA BY KISSES.

From the report of the physicians in attendance upon the grand ducal family of Hesse-Darmstadt during the recent outbreak of diphtheria which resulted in the death of Princess Alice, the range of the disease appears to have been sharply limited. From November 6 to the 14th six of the family were attacked; on the 6th, Princess Victoria, aged 16; in the night from the 11th to the 12th Princess Alice, aged 6; on the 12th Princess Mary, aged 4; in the night from the 12th to the 13th, Princess Irene, aged 12; in the afternoon of the 13th, the Hereditary Grand Duke Ernst Ludwig, aged 10; and on the 14th, the Grand Duke himself. Of the entire family, the Grand Duchess (Princess Alice of Great Britain) and one daughter (Princess Elizabeth) only were spared at that outbreak of the disease. The Grand Duchess, however, was attacked afterward. Immediately after the first member of the family (Princess Victoria) had fallen ill she was seen by a physician and at once separated from all the others. The same caution was observed after the falling ill of the other princesses, but without preventing the outbreak of the disease in the rest of the family. In all cases there were large patches of false membrane on the tonsils, and in most of them swelling of the lymphatic glands in the angle of the jaw. All the patients recovered with the exception of Princess Mary, in whose case the disease from its very beginning had shown a very insidious character. No member of the household (in all 60 persons), no nurse, no physician was infected. It is, therefore, clear, the British *Medical Journal* asserts, that "all the cases were produced by direct infection, doubtless by kisses." The physicians ascribe the intensity and limited extension of the epidemic to three conditions: 1. To the intensity of the infection carried from outside, because the membrane in the case of the first patient (Princess Victoria) looked from their very appearance discolored and ecchymosed; 2, to the direct transference of the infectious matter by kisses; 3, to the condition of the mucous membrane of the tonsils and of the pharynx of the infected persons, all of them having suffered very frequently from acute and chronic affection of these parts.

The lesson to be derived from this not exceptional experience is very clear. As every physician knows, it is no uncommon thing for adults to have diphtheria so mildly that it is mistaken for an ordinary sore throat resulting from cold; yet such a person can easily infect a child, and the child become a center of malignant infection. In view of the fatal prevalence of diphtheria, therefore, the kissing of a child upon the mouth by a person with a sore throat is hazardous, if not criminal; and scarcely less so is the practice of allowing children to kiss their ailing playmates. It would be wise to exercise great caution in this matter if not to discontinue the practice of kissing upon the mouth altogether.

New Agricultural Inventions.

An improved Load Binder has been patented by Mr. Henry A. Harris, of Katonah, N. Y. This is a simple and conveniently operated apparatus substituted for the pole and chains ordinarily employed for binding hay, straw, cut grain, or bales, bundles, etc., upon a rack or wagon body.

An improved Guano Distributer has been patented by Mr. James P. Lowell, of Purcellville, Va. The improvement relates particularly to the construction of the devices both for stirring the material in the hopper, and thus preventing its becoming aggregated in lumps, and also for causing its free and uniform discharge from the hopper.

Messrs. C. A. Sprague and John W. Clardy, of Weaver's Station, Ala., have patented a Cotton Chopper and Rake in which a vibrating hoe is employed to thin out the plants.

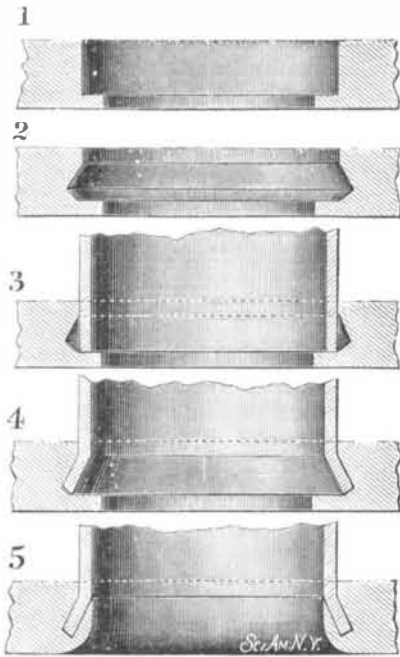
Mr. Aaron F. French, of Denison, Iowa, has patented an improved Harrow, the frame of which is fastened together by iron rods passed transversely into the ends and screwed into nuts or burrs let into the end beams. These rods serve also as draught bars, to which the whiffletrees are hooked.

An International Fish Show.

An international exhibition of the methods and products of sea and inland fisheries will be held at Berlin, Prussia, in April, 1880. Mr. R. B. Roosevelt urges the sending of exhibits from this country, confident that in several departments we could easily carry off the honors, though the Scandinavian states are far ahead of us in variety of methods of preserving fish.

A NEW METHOD OF SETTING BOILER TUBES.

We illustrate herewith a novel plan for setting tubes in steam boilers, which was recently patented by Mr. John E. Jerrold, of Meadville, Pa. The engraving exhibits the successive steps in the process of setting the tubes. Fig. 1 shows the tube sheet counterbored so as to leave an internal flange on the face side of the tube sheet. Fig. 2 shows the hole enlarged to receive the flared end of the tube. In Fig. 3 the end of the tube is in position to be flared, as shown in Fig. 4. In Fig. 5 the tube setting is shown complete, the internal flange of the tube sheet having been set down upon the flaring end of the tube.



JERROLD'S METHOD OF SETTING BOILER TUBES.

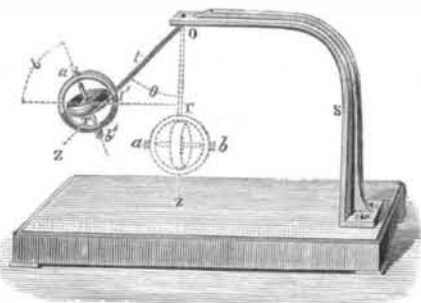
It is claimed by the inventor that a perfectly tight joint is secured without the use of an expanding tool. The surface of the tube sheet is perfectly plain and smooth, and the end of the tube is covered and protected from the fire. When this improvement is used copper thimbles will not be required.

We are informed that this method of tube setting has been thoroughly tested by some of the largest railroads in this country, and has proved very satisfactory.

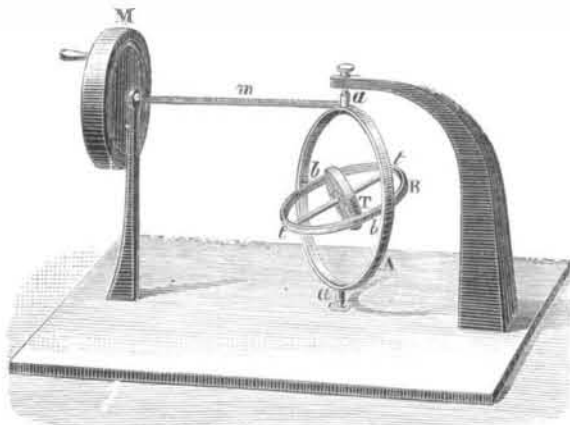
The patent is owned by the Patent Tube Setting Co., of Salamanca, N. Y. Further information may be obtained from J. F. Caldwell, secretary of the company, at Meadville, Pa.

THE GRUEY GYROSCOPE AND THE GYROSCOPIC PENDULUM.

The accompanying engravings represent two little instruments illustrating the principles involved in birotary or paradoxical motion. They were constructed by Mr. Gruey, a member of the French Academy of Sciences.



In Fig. 2, A is a brass ring suspended at *a*, so that it may swing freely around an axis, *aa*. Within this ring is suspended a second ring, B, revolving around the axis, *bb*. T is a circular disk turning with its axis, *tt*, within the second ring, B; a plane, laid through *tt*, traverses perpendicularly one laid through *bb*. At *a* the ring, A, is



connected with a rod, *m*, the other extremity of which runs smoothly in an undulating groove in the wheel, M. When the latter is turned by means of the crank an oscillating motion is imparted to the rod, *m*, and consequently to the ring, A. These oscillations are very short and unobserved by the eye; the ring, A, apparently remains at rest.

The circular disk, having received a certain initial rotary velocity, the ring, B, is struck with the finger so as to impart to it a speed of 50 revolutions per second. The speed of the ring, B, increases in the measure as the rotary motion of the disk, T, is accelerated by turning the wheel, M, more rapidly. When this operation is stopped, the apparatus gradually comes to a standstill. This simple experiment illustrates well the rotation of a body around two different axes perpendicular to each other.

Fig. 1 represents the gyroscopic pendulum. A ring similar to the ring, A, in the gyroscope, is suspended by a thread of India rubber. Within the same a circular disk revolves freely with its axis, *a' b'*. When at rest the apparatus is in the vertical position, as indicated by the engraving. If, while in this position, the thread be twisted up and again allowed to untwist, after a rotary motion has been imparted to the disk, T, by striking it with the hand, the equilibrium is at once disturbed. As the thread twists and untwists alternately the pendulum assumes an inclined position and oscillates around a conical space with wide base, till the energy of the rotary motion of the disk, T, is exhausted and the latter is at rest.—*Les Mondes*.

Petroleum Notes.
PIPE LINES.

The United Pipe Line Company was organized in 1877 by a consolidation between the following companies, viz.: The (old) United Pipe Lines, the Antwerp and Oil City Pipe Companies, the Atlantic Pipe Company, the American Transfer Company (in Clarion and Venango counties), and the Sandy Pipe Line.

At the present time (October, 1878) the company owns, and has in active operation, over 1,500 miles of 2 inch pipe, and 300 miles of 3 and 4 inch pipe. It has connected with these pipes more than 350 iron tanks, with a capacity of over 5,200,000 barrels of 42 gallons each, of which 1,800,000 barrels are owned by the company, and 3,400,000 barrels held by them under contract with the owners. It owns over 800 miles of telegraph wire connecting all its offices and stations with each other, and with the general office of the company at Oil City, Pa. It is fully equipped with boilers, pumps, and all necessary means for receiving and transporting to delivery points at least 75,000 barrels of oil per day. It has points of delivery upon all railroads in the oil regions, at which 2,500 cars, containing 225,000 barrels, can be loaded daily; and can deliver directly to refineries at Oil City, Pa.

OIL PRODUCTION.

The total production of crude petroleum, says *Stonell's Petroleum Reporter*, in Pennsylvania in November, 1878, was 1,348,952 barrels, against 1,173,420 barrels in November, 1877. Increase in 1878, 175,532 barrels.

The total amount of crude petroleum held in the producing regions of Pennsylvania December 1, 1878, was 4,289,309 barrels, against 2,471,798 barrels on the 1st day of December, 1877. Increase, 1,817,511 barrels.

The total exports of petroleum from the United States from January 1, 1878, to November 29, was 305,444,727 gallons, against 317,064,396 gallons for the same time in 1877. Decrease in 1878, 11,619,669 gallons. The Bradford district produced during the month of November, 746,279 barrels of petroleum, being about one half of the entire production in the United States.

The amount of crude petroleum represented by outstanding certificates on the last day of November was 1,784,443.35 barrels, against 1,517,484.27 barrels on the last day of October, a reduction during November of 266,959.88 barrels.

The oil produce of Pennsylvania has been to that State of more intrinsic value than all other industries combined. Its daily output of crude oil is about \$500,000, varying somewhat, of course, with market values. But for all practical purposes this estimate may be taken as correct. Now, this exceeds the daily gold and silver product of the Pacific slope. We recently gave detailed statistics on this point which prove the accuracy of our present statement.—*San Francisco Post*.

KENTUCKY.—The Carter and Alexander well, which was drilled on Renox Creek, in 1865, and never tested, has recently commenced flowing oil at the rate of 100 barrels per day. The gravity of the oil is about 41° and dark brown in color.

ONTARIO.—Exports of petroleum from the United States to the Dominion of Canada during the fiscal year ending June 30, 1877:

Crude.....	270 bbls.,	valued at \$	2,158
Naphtha.....	83 "	" "	795
Illuminating.....	13,224 "	" "	187,451
Lubricating.....	1,728 "	" "	21,959
Residuum.....	76 "	" "	505
	15,381 "	" "	\$162,868

JAPAN.—Crude oil is obtained in ten different provinces in Japan, and its existence has been known, according to Japanese writers, since A.D. 615, but the art of purifying it was not known till some six years ago; since which time refining establishments have been erected in five different places, with a total capacity of turning out 4,000 gallons per day.

ASIA.—The valley of the Euphrates is destined to become one of the greatest commercial and important political centers of the world. I have myself seen whole caravans traveling through this region bearing nothing but American petroleum. American petroleum now lights up the dark places of Nineveh, of Jerusalem, and all the cities of the East.—*Lecture by Dr. Newman*.