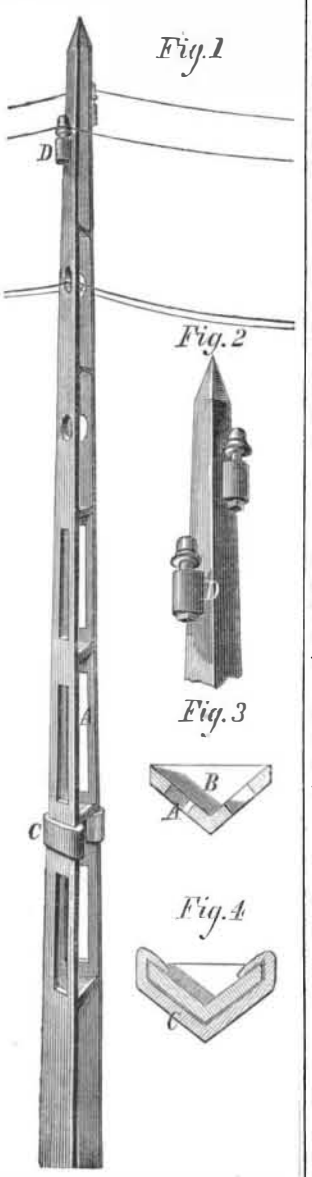
NEW FORM FOR METALLIC TELEGRAPH POLES.

We presume that there are few who, in common with ourselves, have not been impressed with the unsightliness of the cumbrous wooden telegraph poles which disfigure the finest thoroughfares of our large cities. Huge tall posts, often crooked, with their defects made still more glaring by a coat of white paint, far from correspond with handsome stone façades or elegant architectural adornment. Hence it may be imagined that any substitute, particularly if made of metal, such as the novel invention herewith illustrated, and of a neat and graceful design, will receive favorable consideration, both from telegraph companies, in point of its superior economy, and on account of its unobtrusive and even ornamental appearance from those charged with the improvement of our city streets.



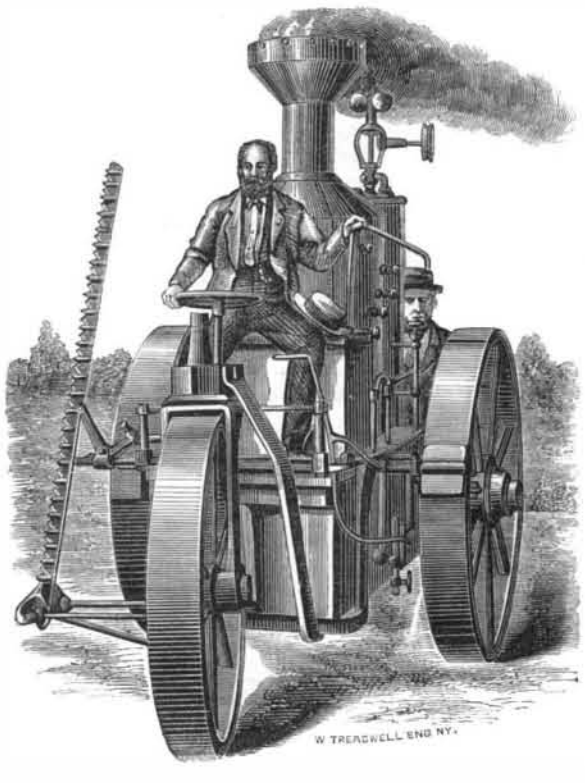
The posts are made in sections, of either cast or rolled angle iron, and constructed of the form shown in Fig. 1, that is, tapering from the base to the top; and when made of cast metal the wide flanges have long openings or slots, A, in which pins may be inserted to adjust the wires. A horizontal section of these portions is represented in Fig. 3. The cross pieces, B, by which to climb, may be cast in the angle between the wires.

The sections are connected together by slips, C, Figs. 1 and 4, on the end of one section; between which and the extremity of said section, the end of the adjoining portion is slid in. Similar clips, or dovetailed grooved clips, D, are applied to the upper ends of the top sections, Fig. 2, for the reception of the insulators for holding the wires.

It is claimed that posts of this form are cheaper and more durable than those of any other pattern now in use. Patented through the Scientific American Patent Agency, June 3, 1873. For further particulars address McCarver, Athey & Jennings, Oregon city, Oregon.

CUMMINGS' STEAM MOWING, REAPING, AND THRASHING MACHINE.

Some issues back, we published an engraving and description of the Hayes steam reaper, an agricultural invention of considerable merit recently introduced in England. The article attracted the notice of a correspondent, Mr. Marcellus



V. Cummings, of Geneseo, Henry county, Illinois, who has lately forwarded to us the facts, embodied in the following description and illustrated in the annexed engraving, relative to a machine of similar description, invented and patented by him (May 12, 1868) over five years ago, which, he informs us, is now in actual and successful use in the above mentioned locality. Our illustration, from a photograph, will convey an excellent idea of its appearance and construction. The boiler is thirty-one inches in diameter by five feet in length, and is of the tubular pattern. There are two steam cylinders, each four by eight inches, together with a water tank holding five barrels of water, and coal bunkers containing five bushels of coal. The large driving wheels are five feet in diameter and eight inches in tread; the front steering wheel, operated as shown, is four feet in diameter, with similar tread. The grass sickle cuts six feet four inches and the grain sickle nine feet six inches.

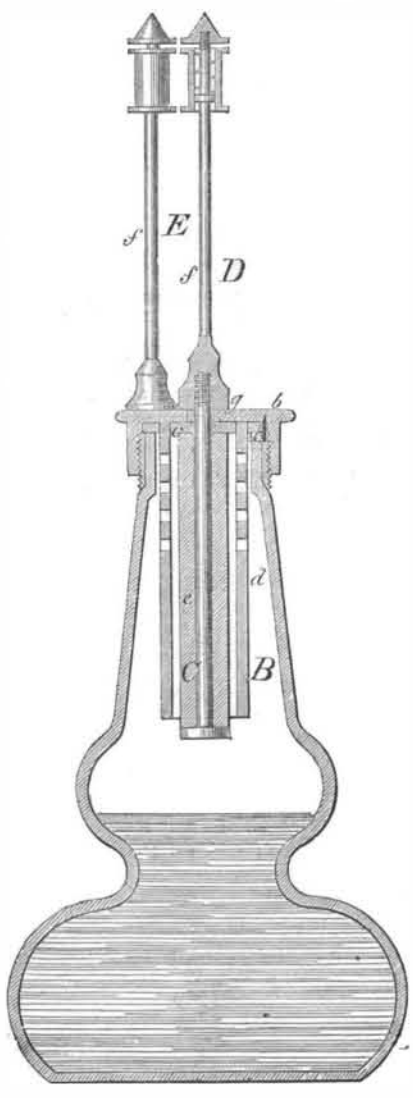
The inventor states that he drives his engine from farm to farm without the aid of horses, and that it traverses over plowed land, up hill or down, with the greatest ease. The rate of speed is about four miles per hour, and an acre of ground can be mown in twenty minutes. The grain thrashing machine is placed on a two wheeled carriage, which is coupled on behind the engine, and is thus hauled by the latter over country roads, from place to place, throughout whole counties. The entire weight of the apparatus is 4,200 lbs.

Judging from the facts transmitted to us, this invention appears of considerable importance and worthy of the attention of farmers having large tracts of land under cultivation. The patentee states that his means did not admit of his constructing more than one machine, by the aid of which, however, he has earned sufficient to build another. If, as he asserted, and doubtless with truth, its advantages, both in itself and as a traction engine, are so extended, it amply deserves a reputation much wider than it has attained.

ELECTRIC GAS LIGHTER.

We are indebted to the Belgian *Bulletin de Musée* for the accompanying illustration and description of an ingenious gas-lighting apparatus, the invention of Dr. Klinkerfues. The principle of the device is the heating of a coil of fine platinum wire, by a weak current of electricity, to a sufficient temperature to ignite the gas.

The invention is composed of a glass vase of suitable shape, closed by a cover screwed on, and packed so as to exclude the air by a rubber plate, A. The two elements, B and C, are zinc and graphite, the former is in the shape of a tube, is pierced with several holes, and is attached to the



cover. The graphite is in the form of a cylinder and is secured as described further on. Upon the cover are the two electrodes, D and E, consisting of rods of brass at the upper extremities of which are spring clamps which hold the spiral of platinum wire. One electrode, D, is attached directly to the cover, the other, E, carries the graphite cylinder, and is isolated at its point of contact with the cover by a rubber envelope.

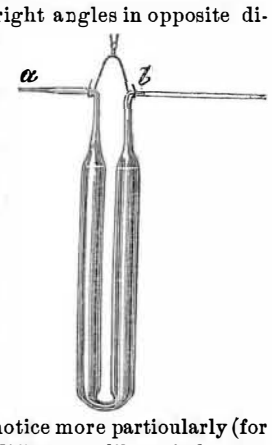
The liquid contained in the vase is composed of three parts chromate of potash, four of sulphuric acid, and eighteen of distilled water. To use the apparatus it is only necessary to slightly incline the vase so that the liquid is brought in contact with the elements. A current is established which heats the platinum by which the gas is lit. On returning the device to its vertical position, the fluid rests at the bottom and the current is interrupted.

The same inventor has arranged a similar plan for the automatic lighting of jets, the apparatus being placed upon the burner. During the day, while the pressure of gas is low, or when the supply is partially or wholly turned off, the liquid is not in contact with the zinc and graphite; but on admitting a greater pressure, the fluid is forced up and a current established. This device, hardly so practical in form as that above described, was fully explained on page 393 of our volume XXIV.

SPECIFIC GRAVITY INDICATOR.

Dr. Hermann Sprengel says, in the *Journal of the Chemical Society*: "I have, for a number of years, availed myself of pipette shaped vessels in preference to the usual specific gravity bottle, the following being a short description of my method:

"The form of my instrument, Fig. 1, is that of an elongated U tube, the open ends of which terminate in two capillary tubes, which are bent at right angles in opposite directions. The size and weight of this instrument should be adapted to the size and capability of the balance in which it is to be weighed. The instrument which served for my determinations had a length of 7 inches, and was made of a glass tube, the outer diameter of which was $\frac{7}{16}$ of an inch. It hardly need be mentioned that the U shape is adopted for the sake of presenting a large surface, and so rendering the instrument sensitive to changes of temperature. The point, however, which I wish to notice more particularly (for reasons explained below) is the different caliber of the two capillary tubes. The shorter one is a good deal narrower (at least towards the end) than the longer one, the inner diameter of which is about ·02 of an inch. The horizontal part of this wider tube is marked near the bend with a delicate line, *b*. This line and the extremity of the opposite capillary tube, *a*, are the marks which limit the volume of the liquid to be weighed.



The filling of the instrument is easily effected by suction, provided that the little bulb apparatus (as represented in Fig. 2) has previously been attached to the narrow capillary tube by means of a perforated stopper, that is, a bit of india rubber tube, tightly fitting the conical tubulus of the bulb. On dipping the wider and longer capillary tube into a liquid, suction applied to the open end of the india rubber tube will produce a partial vacuum in the apparatus, causing the liquid to enter the U tube. As this partial vacuum maintains itself for some time (on account of the bulb, which acts as an air chamber), it is not necessary to continue the suction, if the end of the india rubber tube be timely closed by compression between the fingers. When bulb and U tube have about equal capacity, it is hardly necessary, during the filling, to repeat the exhaustion more than once. Without such a bulb, the filling of the U tube through these fine capillary tubes is found somewhat tiresome. The emptying of the U tube is effected by reversing the action and so compressing the air.

"After the U tube has been filled, it is detached from the bulb, placed in water of the standard temperature almost up to the bends in the capillary tubes, left there until it has assumed this temperature, and, after a careful adjustment of the volume, it is taken out, dried, and weighed.

"Particular care must be taken to insure the correctness of the standard temperature, for a mistake of 0·1°, causes an error in the 5th decimal, making 100000 parts 100001·4 parts.

"A peculiar feature of my instrument is the ease and precision with which the measurement of the liquid can be adjusted at the moment it has taken the standard temperature; for it will be found that the liquid expands and contracts only in the wider capillary tube, namely, in the direction of the least resistance. The narrow capillary tube remains always completely filled. Supposing the liquid reaches beyond the mark, *b*, it may be reduced through capillary force

by touching the point, *a*, with a little roll of filter paper. Supposing, however, that in so doing too much liquid is abstracted, capillary force will redress the fault, if point, *a*, be touched with a drop of the liquid under examination; for this gentle force acts instantly through the whole mass of the liquid, causing it to move forward again to or beyond the mark.

"As the instrument itself possesses the properties of a delicate thermometer, the time when it has reached the standard temperature of the bath may be learned from the sta-

ility of the thread of liquid inside the wider capillary tube. The length of this thread remains constant after the lapse of about five minutes.

"In wiping the instrument (after its removal from the bath) care should be taken not to touch point, *a*, as capillarity might extract some of the liquid; otherwise the handling of the instrument requires no especial precaution.

"The nicety attainable by this method is very satisfactory."

[From the Fourth Annual Report of Charles V. Riley, State Entomologist of Missouri.]

THE GREAT LEOPARD MOTH.

There is a large family of moths, known as Arctians or tiger moths, which is rendered conspicuous by the beauty of design and boldness of contrast in color which its members generally present. There are two whose caterpillars are often seen, either rolled up cozily under some plant or crawling rapidly across a path, but which are not by any means generally known in their more beautiful and perfect states. They were both more than usually common the past year, and both have very similar habits. They neither of them can be considered injurious; but a brief account of their transformations, in this department of my report, will doubtless please and gratify many an inquisitive reader, who has wondered what the "hedge hog" caterpillars produce.

The species above named is the largest, and perhaps the most beautiful, of the family in North America.

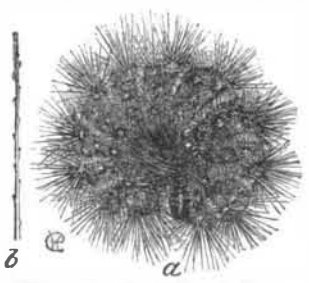


Fig. 1.—The Leopard Moth Larva.

Its larva (Fig 1) may be called the large black bear, as the hairy worms of our different Arctians are popularly called bears, and the family name was derived from the Greek word for "bear." It is often observed in the fall of the year, though few persons have ever seen the moth which it produces. This larva is black, and so thickly covered with jet black spines as almost to hide a series of roughened warts, on each joint, from which the spines spring. When disturbed, it curls itself up, and then the sutures of the joints are seen to be reddish brown, in strong contrast with the black of the rest of the body. If carefully observed, the spines will be seen to be barbed, as represented at *b*.

This worm feeds, mostly during the night, upon the wild sunflower (*helianthus decapetalus*), the different species of plantain (*plantago*), and upon willows. J. A. Lintner, of Albany, N. Y., thinks it likewise feeds on black locust, as he has often found it beneath that tree and has fed it on the leaves. It comes to its growth in the fall, and curls up and passes the winter in any shelter that it can find, being especially fond of getting under the bark of old trees. In the spring, it feeds for a few days on almost any green thing that presents itself, and then forms a loose cocoon, casts its prickly skin, and becomes a chrysalis. The chrysalis is black, and covered with a beautiful pruinescence, which rubs off almost as that covering a Duane's early plum. It has a flattened blunt projection at the extremity, armed with a few barbs and bristles.

In a few exceptional instances I have known both this and the following species to go through all the transformations and produce the moth in the fall. The chrysalis state lasts but about a fortnight, when the moth escapes.

Fig. 2.—The Great Leopard Moth. *Expattheria scribonia*, Stoll. (*Lepidoptera, Arctiadæ.*)

Fig. 2 represents the female moth at *a*, and the male at *b*. The upper portion of the abdomen is steel blue, or blue black, marked longitudinally along the middle and sides with yellow or orange. With this exception, the whole insect is white marked and patterned with dark brown, as in the figures. The male differs from the female principally in his smaller size and more acuminate wings, and by the narrower abdomen, which is also generally duller in color, with the pale markings less distinct. The markings on the wings vary in a striking manner in different individuals, the oval or elliptical rings sometimes filling up, especially in the male, so as to look like black blots. This insect is considered rare in New England, but is much more common in the Mississippi valley. It occurs still more abundantly in the Southern swamps, where the larva is dubbed "fever worm" by the negroes, under the absurd impression that it is the cause of fever and ague.

As an illustration of the wonderful power of resisting extreme cold, which this caterpillar possesses, I will quote the following experience communicated to me by Mr. Lintner. He says: "I had placed one for hybernation in a small keg among leaves, which I inserted in the ground. During my absence from home, either the thawing of the snow or the wind had overturned the keg and driven away the leaves. On my return I found the larva remaining, but stiffly frozen, with its head encased in ice and fastened to the ground. As an experiment I detached a piece of the ground with the larva, and placed it in a warm room. On the thawing of the larva and the release of its head, it was restored to activity."

EN ROUTE TO THE GREAT EXPOSITION.—LETTER FROM UNITED STATES COMMISSIONER PROFESSOR R. H. THURSTON.

NUMBER 2.

LONDON, JUNE 10, 1873.

The previous letter was written while on the Atlantic, with more than one half of our voyage accomplished. The remainder of the distance was made under very similar circumstances of wind and sea. Light wind and sea, invariably ahead, or on the bow, while admirably adapted to meet the wishes of those of the passengers who were at all inclined to suffer from sea sickness, prevented our making a quick passage, and we only made the land, at the north of Ireland, after a thirteen days run from New York.

In that high latitude, the sun, at this season, does not set until late in the evening, and it rises correspondingly early in the morning; while the twilight, on a clear night, is sufficiently bright at midnight to enable us to read a newspaper without very greatly fatiguing the eyes.

It was broad daylight, therefore, when, the next morning, at about three o'clock, an unusual bustle on deck announced that they were preparing to set some of our passengers ashore at Moville, a little village in Lough Foyle, a few miles below Londonderry. A chilling breeze met us, as we stepped on deck, and would have at once sent us below again had the scenery been less beautiful.

THE NORTH COAST OF IRELAND.

The green and fertile fields, lying on the slope which extends from the shore of the lough back to the summits of the surrounding hills, half concealed by the haze of early morning, the little hamlet of Moville close by, the larger dwellings seen at long intervals in the more picturesque spots, and an old ivy-covered, ruined castle, which we had just passed, formed, altogether, a picture beautiful intrinsically, and one which, to eyes which had been, for nearly two weeks, only able to contemplate an unvaried expanse of rolling waves, appeared a second Eden.

The steerage passengers were nearly all landed here, and the ship was soon headed seaward again. As the northern coast of Ireland was rounded, we had an opportunity to see that singular basaltic formation,

THE GIANT'S CAUSEWAY,

where 40,000 columns are packed closely together, forming the precipitous boundary of the Irish coast of Antrim. Isolated columns stood here and there, like colossal sentinels. At one point, a vast mass stood by itself at some distance from the face of the Causeway, with which it was connected by a bridge of ropes—a rude suspension bridge which has been thrown across the fearful looking gulf by some bold and skillful fisherman. It is a most interesting specimen of early engineering, for, like the rope bridges seen in South America and in China, this construction antedates considerably the days of Roebling.

THE CLYDE.

From this point all the way around the coast, across the North Channel, and up the Firth and the river Clyde, our eyes were feasting upon ever changing but always beautiful scenes. The lofty headlands of the Mull of Cantire, the hills of Arran and of Holy Island, the romantic bays and the narrow mouthed lochs of the Scotch coast, afford uninterrupted enjoyment to the lover of the beautiful in nature. At one point, we obtained a fine view of the summit of Ben Lomond, enveloped in a soft purple haze, yet brought out into relief by a background of clouds illuminated by the bright golden rays of the setting sun. We took a pilot at Greenock, and, as we steamed slowly by the wharves of that old town—the birth place of James Watt—we counted nearly twenty large iron steamers, completed or in process of construction.

Just below, we had passed a great steamer, the City of Chester, next to the Great Eastern the largest in the world; and, not far above, we saw the monument erected to Henry Bell, who sixty years ago built, here on the Clyde, the first successful steam vessel which ever ran in British waters. She was a little craft of about 60 tuns burden; the City of Chester probably has a displacement of seven or eight thousand tuns. The latter is nearly 600 feet long.

Nothing could be more appropriate than that the scene of the birth and of the first great work of James Watt, and that of the earliest triumphs of Bell, should be known, to-day, as the spot where the greatest masterpieces of human constructive talent are wrought.

Just above Greenock is the famous castle of Dumbarton, where Wallace was for a time imprisoned. This, then impregnable, stronghold is built upon an enormous, steep sided, rock, which stands 500 feet high, all by itself upon the shore, and, projecting out into the tide, is a most strikingly picturesque object. Behind it is the village of Dumbarton, where the Messrs. Denny are building some fine iron ships.

The scenery becomes less striking as we go up the river; and the beautiful environed fishing villages, and the pleasant watering places, seen so frequently on the shores of the Firth, give place to isolated farm houses or elegant country seats, with smooth lawns and grounds elegantly laid out, as we progress towards Glasgow.

As Glasgow is approached, the whole work done by the "Clyde Trust" in deepening the river, reclaiming the formerly overflowed meadows which border it, and in building substantial embankments, is observed by every one.

GLASGOW.

The prosperity of a city is seldom dependent upon local natural advantages alone; and the proximity of the iron and coal producing districts of Scotland, her experience in manufacturing, and the advantages arising from the fact that Glasgow is the birthplace of British marine engineering, could hardly have given that city her present position as the second in population (and the first in the realm in several branches of manufactures) had not her people, long ago, had sufficient foresight and energy to expend enormous sums in the improvement of the water approaches to the city.

Two hundred years ago the port of Glasgow was on the Ayrshire coast. To-day ships drawing twenty-three feet of water have reached the city wharves.

The work of maintaining and improving the ship channel below Glasgow is, by act of Parliament, placed in the hands of the Clyde Trust Company, which is controlled by Glasgow capital. This company have expended, in this work, about *twenty-eight millions* of dollars, and are still at work on their great scheme. They are permitted to levy a moderate tunnage tax, and the value of their labors, to the city, may be inferred from the increase of their income from this source. They received, in 1840, $286,487; in 1860, $443,938; and, in 1870, $493,346.

They are employing a number of immense dredging machines, and are removing about one million of tuns from the channel, annually. The registered tunnage of vessels arriving and departing annually has now exceeded the enormous amount of 5,000,000 tuns.

The wharf at which we landed was reached, after passing the great shipyards from which a large portion of all the iron vessels in the world are sent out, and after slowly threading the narrow channel left between the long lines of steamers and sailing vessels which were closely packed on each side, sometimes three or four abreast. We ran the gauntlet of custom officials and were glad to find ourselves comfortably settled in our hotel, in the small hours "ayont the twal."

We had hoped to be able to make a leisurely tour *Weltausstellung*-ward, visiting some important manufacturing establishments in Great Britain and France, and some well known technical schools *en route*, but, among the letters awaiting us, at the office of our consul, was an urgent request to appear at headquarters in Vienna during the following week. Much can be done in even the limited time allowed, if it is well employed, and our programme includes a day in Glasgow, a day in London, one in Paris and one in Munich, and at least three nights on the rail. R. H. T.

Cultivation of Lobsters.

An interesting account of some recent experiments in the breeding of lobsters is presented by a correspondent of the Boston *Journal of Commerce*, the locality of the trial being on the New England sea coast, which is celebrated for lobster fruitfulness, even if its shores are sandy. It appears that the lobster conservatory consists of an inlet from the sea which has been enclosed by an embankment. The space enclosed contains thirty acres, and gates are provided to permit the tidal movement of the water.

"Last summer some 40,000 lobsters, of every age and condition, were let loose in the pond. Many of them were in the soft shell state, and many were unsaleable on account of a lost claw, or other mutilation. Food, in the shape of refuse from the fish market, was freely supplied to them; and a gate was put up at the entrance to prevent their escape into the sea.

When the ice had covered the pond, holes were cut and lobster traps were put down. Good, sizeable hard shell lobsters were at once caught, and two things were proved: First, the water was deep and pure enough to keep the fish alive, and secondly, the fish were healthy, for they had taken their hardened shells, in the usual manner, and new claws had grown in the place of those lost. In the spring, eels, perch and a great many other kinds of fish were taken from the pond in liberal quantities; and now that the spawning season is well advanced, the farm has reached its final and most critical stage. Some 15,000 good, marketable lobsters have been taken out and sold. Everything is favorable so far.

The experiment is a very important one. If it succeeds it will introduce an entirely new system of lobster fishing, and do much to prevent the destruction of the natural supply. Nor is this all: for the same pond can be made to yield perch, flounders, eels, smelts, and other fish in great quantities, at no additional expense.

Mr. J. H. Johnston, of the Great Western Gun Works, 179 Smithfield street, Pittsburgh, Pa., whose advertisement has been published in this paper for some time past, requests us to state that the minimum price of his double barrel shot guns should have been published at $8 instead of $3. We take this method of calling attention to the mistake, and would direct attention to his advertisement on another page.