Colorado seems to be the favorite district for investment of New York and other Eastern capital because of its comparative proximity to us and of its good average returns on careful investments, but a great loss of gold is reported in the working of the rich telluride belt of Boulder county, and some improved method of working is imperatively demanded. Here is a good opportunity for inventors, for the telluride ores are among the richest known.

The gold mining business on our Atlantic coast is generally characterized by extreme slowness; stronger organizations and improved methods of working are here needed for fair development of the mineral wealth.

The general and well considered renewal of these industries cannot fail of exercising a beneficent and extensive influence throughout the country.

CORUNDUM.—ITS OCCURRENCE AND DISTRIBUTION.

The recent publication in the SCIENTIFIC AMERICAN SUPPLEMENT (*vide* No. 125, for 1878) of an elaborate paper on the industrial applications of emery and corundum has attracted such general attention that the presentation of an article upon the distribution of this useful mineral, and the quantities available for the future demands of industry, will be read with interest.

All, or nearly all, the deposits of corundum of any magnitude found in the world occur in the serpentine (or crysolite) formations, or in rocks immediately adjoining, and associated with these.

In this country it has been found in such association in numerous localities from Massachusettes to Alabama, and in certain parts of this range of occurrence in deposits of considerable magnitude.

The most important deposit in the Eastern States is that found at Chester, Mass., where, in a vein four feet in thickness, it has been traced with reasonable evidence of continuity over a distance of four miles.

The corundum of this locality is more or less abundantly mixed with iron oxide, and in this respect, as well as from its somewhat granular texture, it approaches in constitution the variety known as emery.

Small quantities of the mineral have also been found at Pelham, Mass., and at Litchfield, Conn. The Chester deposit has yielded considerable quantities of the mineral, and is still being worked.

In Pennsylvania, corundum has been found in many localities. One considerable deposit at Blue Hill has been traced with more or less certainty for about five miles, to near Rockdale, in Delaware Co. It has also been detected at Mineral Hill and Black Horse in the same county. At both the last named localities no deposits in either have yet been found, although the evidence of their existence is made probable by the finding of isolated bowlders and fragments of the mineral.

The largest occurrence of the mineral yet found in Pennsylvania occurs at Unionville, Chester Co., where it forms a deposit of from five to ten feet in thickness and of unknown extent. This mine has yielded considerable quantities of the mineral, but is not being extensively worked at the present time. The product of this mine is very pure, and has been pronounced by experts to be superior in cutting qualities to the finest Turkish emery. It is prepared and brought into the market, ground like emery, graded in various degrees of fineness from grains to flour. Concerning the available quantity of the mineral at this locality, but little positive information exists, nor has the mine been worked steadily. Some shipments from this mine have been made to England. From surface indications based upon lithological characteristics, the inference would appear to be warranted that in this region of Southeastern Pennsylvania corundum will be found in quantities sufficient to meet any probable demand for it in the near future.

Proceeding southward, it may be worthy of notice that corundum has been found in Virginia, at Staunton, in Augusta Co., but only in isolated specimens. By far the most numerous and interesting occurrences of corundum in this country occur in the State of North Carolina, where there is a corundum belt, which stretches, with occasional interruptions, in a southwesterly direction from Madison Co. through the State of Georgia, and into Tallapoosa Co., Alabama, a distance of at least 250 miles.

The variety, beauty, and purity of the corundum in many parts of this belt are unequaled, exhibiting in many instances huge crystals and splendid crystalline masses, showing perfect cleavage, and displaying the fine red and blue colorations of the ruby and sapphire. It has been mined at several points in North Carolina, especially at and in the neighborhood of Corundum Hill, near Franklin, Macon Co., by Col. Jenks and others, but whether because the demand for the mineral is limited, or because of the expense of mining and transportation to market, these deposits have not as yet attained much commercial importance.

Gainesville, Hall Co., Georgia, and Dudleyville, Alabama, may also be named as localities in these States respectively where the mineral has been detected in considerable quantity. From the foregoing *résumé*, it will appear that there is no dearth of corundum in the United States; and that should an extensive demand grow up for it in the several industries in which it has been successfully applied, the home and foreign markets could be abundantly supplied from our domestic deposits.

Concerning foreign occurrences of the mineral, the following brief summary may be of interest:

Professor Rose, of Berlin, has described an occurrence of corundum at Mramorsk, in the Ural regions, where it occurs associated with serpentine and allied rocks. The mineral appears, from his account, to be too much disseminated in the accompanying chloritic schists to promise any commercial value.

Great deposits of the impure dark granular variety of corundum, known as emery, occur at Naxos and Nicaria, in the Grecian Archipelago. There are also numerous deposits in Asia Minor, discovered by the American chemist, Dr. J. Lawrence Smith, to whose scientific zeal, combined with a keen practical perception, the Turkish Government is indebted for the creation of a valuable industry. Of other deposits of the mineral, in India and elsewhere, but little is positively known.

NOTES OF PATENT OFFICE DECISIONS.

In Sheldon's case, the subject matter of his application consisted in incorporating in a railway passenger ticket a contract with, and a personal description of, the purchaser. The ticket was one of that class which is good for a certain trip and for a certain length of time, and is not transferable.

The contract was to be signed by the purchaser in the presence of the person who sold the ticket, and contained a provision that in consideration of selling the ticket at a reduced rate, it should be good only for the person named and described, for the passage and time mentioned therein; that if transferred to any other person it should be forfeited; that the execution of the holder's signature should be made in the presence of the conductor when required, etc. Following this contract was a form or schedule containing the personal description of the purchaser, together with his signature.

The personal description, and the requirement that the purchaser should sign his name in the presence of the conductor upon the delivery of the ticket, when requested by the conductor, were the means of identification adopted by the applicant for a patent. His claim was for the ticket, with the description and executed contract, arranged substantially as shown and described.

The acting-commissioner finds that, considered as a mere structure, the claim was made up of three elements, all of which were old, and each of which performed the same function that it had performed in other places and in other kinds of business. A non-transferable ticket was old; the contract signed by the purchaser was old; and the personal description of a person holding a contract or other paper, by which he might be identified, was also old. It was a common means of identifying depositors at banks to require the depositor, upon drawing from the bank, to write his signature, for the purpose of identification by comparison with the signature already recorded in the books of the bank. It was a common method in the military service, upon giving a discharge to a soldier, to incorporate therein a description of his person for the purpose of subsequent identification. It was usual also to incorporate a personal description in a passport.

The acting-commissioner, however, holds that the matter should not be regarded as a structure; but that if patentable at all, it was as a new method of doing business.

The primary object of this railroad ticket, like all other similar tickets, was to grant the privilege to a purchaser thereof to travel on a certain railroad over a certain distance. It was the token of a contract entered into between the railroad company and a passenger, by which contract it is provided that in consideration of a certain amount paid by the passenger he has the right to ride on the railroad mentioned, the distance therein indicated. Any conditions other than this are held by the acting-commissioner to be simply additions to the contract. The essence of this so-called invention, therefore, was a contract. The making of the original signature, the re-signing, and the submitting to a personal inspection and description on the part of the passenger, were all conditions of one and the same contract. An ordinary ticket without any signatures, such as is generally sold to passengers for a single trip, is a contract, and the present ticket is the same thing, with additional conditions annexed thereto. The case, therefore, resolved itself into the question: Does a business contract constitute a proper subject of a patent? The acting-commissioner answers the question in the negative, and rejects the application for a patent.

Trade with Russia.

Since the first of January, 1878, eighty-one shipments, consisting of tools, machinery, rope, and other articles, have been made from this country to Russia, through the efforts of a Russian gentleman who is trying hard to divert to this country that portion of the Russian trade now commanded by England. In a recent interview with a representative of the Philadelphia *Press*, he said:

"The trade of England with Russia amounts to 133,000,000 rubles. I do not despair of reducing this one half in favor of America within five years. We want to fight England; if we cannot do it by warfare, we can by striking at her where she is most sensitive and vulnerable—in her trade. I find your manufacturers here willing to lend their aid and to sell for the smallest profit, looking to the future. It keeps the mills going; it brings our money here instead of to England. In Pittsburg and Oil City, and especially here in Philadelphia, where I have had transactions, I find everybody willing to co-operate in this way, and I have found assurances that distance will be no barrier to a successful trade. There is now, more than ever before, a splendid field for American goods in Russia. It is not to be supposed that we will put one cent more than we can help into British pockets, while we do want to build up our trade and more closely cement our friendship with America. But one thing must never be forgotten. The goods must be of the best quality; the price must be such as to compete with the British. There is no sentiment in business. I venture to say that if an effort is made here by your merchants to push a trade with us on these terms, they will find a most gratifying response."

Patentees Rewarded.

The following compiled from the *Tribune* indicates the manner in which Great Britain rewards her inventors:

Since 1860 England has paid £102,775 to inventors for discoveries in connection with ordnance and small arms. Mr. Henry got £5,600 for breech-loading rifles and improvements in firearms; Mr. Westley Richards, £2,375 for his breech-loading carbine; Mr. Snider, Mr. Wilson and Colonel Roden, £16,000 for their plan for converting muzzle-loaders into breech-loaders; Colonel Snider got another sum of £5,000 for the Snider rifle, and Mr. Lancaster £4,000 for his plan of rifling guns and small arms. In artillery, Major Palliser got £15,000 for his chilled projectile, £7,500 for his plan for converting cast iron guns, and £1,500 for improvements in artillery; Captain Moncrieff got £10,000 for his method of mounting guns, with £1,000 a year and £5,000 when his engagement ended in 1875; Mr. Hale got £8,000 for rockets; Mr. Frazer, £5,000 for construction of guns; Captain Scott, £2,000 for improvements in gun carriages and £8,000 for other gunnery inventions, and Commodore Harvey, £16,000 for torpedoes.

The Velocity of Light.

One of the most important papers read at the recent meeting of the American Association was that by Albert A. Nicholson, of the United States Navy, on experimental determination of the velocity of light. He said:

"The two methods by which the velocity of light was determined experimentally gave in the hands of Foucault and Cornu results which differ by nearly 1 per cent. To find the correct result is the object of the experiments I have undertaken. The method which I have adopted is essentially that pursued by Foucault, but has this important advantage, that it permits the use of any distance between the mirrors. This is accomplished by using a lens of great focal length, which collects the light from the revolving mirror into a series of parallel pencils, which are reflected back from the surface of a plane mirror. The distance between this and the revolving mirror in the preliminary experiments was 500 feet, and the displacement obtained was 0·63 of an inch—about 25 times that obtained by Foucault. The apparatus used was adapted from the material found in the Naval School, and the experiments were performed under difficulties. The following is a table of results: 186,730; 188,820; 186,330; 185,330; 187,900; 184,500; 185,000; 186,770; 185,800; 187,940; 186,508 mean. 186,600 Cornu. 185,200 Foucault."

Remarkable Steamboat Speed.

The highest speed ever attained by any boat or ship was that obtained by the steam launches recently built for the English Admiralty by Messrs. Yarrow & Co.

The boats are each 85 feet long, 11 feet beam, and draw 3 feet. They are constructed of steel, and have engines capable of indicating 420 horse power.

Run with the tide the one made 22·59 knots, or 26 miles per hour; the other, 23·92 knots, or 27·56 miles per hour. Against the tide, one made 17·69 knots; the other, 18·09. The mean of the two was, respectively, 20·14 knots, or 23·2 miles, and 21 knots, or 24·2 miles.

The Strongest Steamer in the World.

The Italian Government has just launched the ironclad Dandolo, sister ship of the Duilio. Both are to be armed with 100-ton guns, and be armored with 22-inch plates. Not content with these ships, which carry heavier metal than anyone in the English navy (the English Inflexible has 24-inch armor, and carries a pair of 80-ton guns), the government is constructing two others, which are to be armored with 24-inch plates, and are to carry cannon of perhaps 200 tons.

It is a matter of general surprise that Italy should be expending enormous sums for such an irresistible navy. Simple pride of possession cannot be the only impelling motive.

A Runaway Reaper.

The Salem (Oregon) *Statesman* tells a funny story about the performance of a self-binder reaping machine while following unattended a team of runaway horses. Their course lay through a field of wheat containing about a hundred acres; and, strange to say, the machine kept together, and bound every bundle that came to it with lightning rapidity. When the team was stopped, the machine had cut and bound about a hundred and fifty bundles; but the swath was "crookeder than the tangle of the Mollala."

EACH inhabitant in the United States pays $2.02 for the support of the public schools, and $1.39 for military purposes. These two items of expenditure in other countries of the world are as follows: Prussia 51 cents and $2.29; Austria, 34 cents and $1.39; France, 29 cents and $4.50; Italy, 13 cents and $1.57; England and Wales, 66 cents and $3.86; Switzerland, 88 cents and $1.