Communications.

Our Washington Correspondence.

To the Editor of the Scientific American:

Business in the Patent Office still continues brisk, and a larger number of patents than usual are being issued—the average weekly list for the last three weeks being 352, including all issues.

The competitive examination for the vacant position on the Board of Appeals resulted in the names of Messrs. Bates, Wilbur, and Catlin (as the three best on the list) being reported by the Examining Board to the Secretary of the Interior, who nominated the first named gentleman to the President for appointment; and he was accordingly appointed to the position. Mr. Bates being Examiner of Interferences, it became necessary to appoint some one to fill his place; and Mr. Wilbur, as second on the above list, was appointed to this position. This creates a vacancy in the primary examining corps; and now there is to be another examination to fill the place made vacant by Mr. Wilbur's promotion, which will probably take place ere this is published.

The Coast Survey Office is now fitting out two parties to survey the coast of Maine: the first party under Lieutenant Moser, U.S.N., on the steamer Endeavor, and the other under Lieutenant Hawley, on the schooner Ernest. A third party is being fitted out for the purpose of making off-shore tidal current observations in the same locality, under Acting Master Robert Platt, on the schooner Drift.

The question how to survey, economically, the occasional spots of arable land which dot the sterile deserts in the far West has engrossed the attention of the Land Office for several years. The practice has been to extend one of the main base lines and one of the principal meridian lines until they intersect in the vicinity of the spot to be surveyed, and from this point continue the survey by laying out townships, sections, etc. This often involves running lines through desert lands, for hundreds of miles, at great expense; to save which Lieutenant Powell, the explorer, now proposes to arrive at the initial point for this kind of lands by triangulation, which can be done at much less expense and with equal precision. It is thought, however, that the law as it now stands will not allow of this being done; and it is probable that the subject will be submitted to Congress at the next session for consideration, and the necessary change in the law.

Many agents of the different European governments are reported as scattered over the country, engaged in buying up all the white oak timber in the market ready for shipment. The French Government has recently made large purchases in Norfolk and other Southern ports; the English agents are busily negotiating for all they can find in New York, Philadelphia, and Baltimore; and Russian agents are securing all they can find wherever it is to be purchased. Ex-Secretary Robeson was very much blamed by the opposition press for making large purchases of this material during his official term; but now the different foreign agents are willing to pay the government double what he gave for it.

There is now being erected in the Mineral Hall of the Smithsonian Institute some remarkable specimens of the plastic art. One of these is a copy in terra cotta of the group "America" upon one of the pediments of the Albert Memorial in London. The figures are of heroic size, and are probably the largest ever made in this material. There is also a pulpit, with the steps leading thereto in red and white terra cotta, relieved by gilding; and two fonts of the same material. The sides of the pulpit are ornamented with scenes representing the life of the Saviour, and the fonts with scenes connected with children from the Scriptures.

Washington, D. C. OCCASIONAL.

A New Remedy for the Potato Bug.

To the Editor of the Scientific American:

In the spring and summer of 1875, in experimenting with the Colorado potato bug and the action of certain chemicals on the bug and its eggs, I discovered that a solution of the sulpho-carbonate of potassium in water had the property of dissolving the skin or covering of the eggs. When this solution was applied to the potato plants on which there were eggs, that part of the leaf on which the eggs were would be turned brown and dead, and the eggs (which are generally on the under side of the leaves) would be dissolved and run into a pasty mass which soon dried up.

It is not necessary for the solution to come in direct contact with the eggs; for when it was applied to the upperpart of the leaves, the eggs on the under side would be dissolved as effectually, though not quite as fast, as when the solution was applied directly on them.

I do not remember having seen any notice of this action of the sulpho-carbonate of potassium on the eggs of insects; and it occurred to me when I read the article in the SCIENTIFIC AMERICAN of April 28, page 261, by Professor C. V. Riley, on the grasshopper, that this salt might prove as effectual a remedy for the grasshopper, by destroying its eggs while they are in the ground, as it has proved for the phylloxera in France. In the SCIENTIFIC AMERICAN SUPPLEMENT, No. 34, page 536, there is a copy of an article, read before the French Academy of Sciences by M. Joubert, on the sulpho-carbonates as a remedy for the phylloxera. He gives 145 grains per square yard of surface as the amount to be applied for this insect. These proportions would not do to apply for the grasshopper, as it would cost more than the land is worth in many cases. If the sulpho-carbonate of potassium has the same effect on the eggs of the grasshopper as it has on the eggs of the potato bug, it would certainly be well worth trying.

I hope some one who may have the opportunity of trying this remedy will do so and report the result. The sulpho-carbonate which I used is known in the market as the sulphide of potassium.

Philadelphia, Pa. WM. L. BILLIN.

Steam Cars vs. Horses.

To the Editor of the Scientific American:

An experiment was made in Philadelphia, a few days ago, to show the possibility of superseding horses by steam on their railways. The seven cars used in this trial present nothing different in their general plan from that of the most successful ones which have been many times tried and are now in use in some other localities, except perhaps the application of steam to the brakes for sudden stops.

Steam seems destined to complete its mission to man through the media of piston and crank. These simple devices will probably never be superseded as a means of transmitting the force of steam to a driving wheel. The only thing now to be done is to give to the steam car the best material, the best proportion, the best of workmanship, and a level track to work upon, and its complete success will be assured. No grade should exceed twenty feet per mile; it is far better to go three or four miles round than to go half a mile over a hill at a much steeper grade than this. Six of the cars are inside-connected, and have 5½ inch pistons and 7 inch cranks; the other is outside-connected, and has 8 inch pistons and 5 inch cranks. This last is far the best arrangement for hard work. Less area of pistons and longer cranks would be preferable, however, and 5½ inch pistons and 10 inch cranks would be quite as efficient and would impose far less strain upon the bearings, and hence would be more durable. The bodies of the cars are about twenty feet long, five feet of which, at one end, is used for the boiler and engineer, the machinery being placed horizontally under the floor. Now that we have excellent steel plate for boilers, and have learnt to exactly match the rivet holes by drilling, and to rivet by machinery, there can be no reason why a steam car should not be made, with all of our improved appliances and experience, to run twenty years at an expense for repairs of less than twenty dollars a year.

The most formidable bars to the success of steam cars are steep grades. It requires only about 8 lbs. to draw a ton on level rails, while the ascent of a 20 feet grade requires about double this amount; and the ascent of a 160 feet grade, like that upon the Worcester and Shrewsbury road, requires about nine times this amount. To figure this out, we have only to divide the number of feet in a mile by the number of feet rise per mile, and then divide the number of lbs. in a ton by the quotient. The last quotient, *plus* 8, denotes the number of lbs. required to draw a ton up the grade. Thus: $\frac{5280}{160} = 33$, then $\frac{2000}{33} = 60$, then $60 + 8 = 68$ lbs. to draw a ton up a 100 feet grade.

Worcester, Mass. F. G. WOODWARD.

The Russian and Turkish Navies.

The present war between Russia and Turkey is likely to bring about the one event which is needed crucially to test the efficacy of modern armored vessels, that is, their opposition in actual combat. All the building of ironclads, and the constant improvements in their armor due to the increase in power of heavy guns, which have been going on for the past fifteen years, fairly may be regarded as accomplished under conditions embodying a constant element of uncertainty; and this for the reason that the always varying circumstances under which vessels may enter into conflict cannot be foreseen or provided for. Leaving out of consideration the skirmishes which occurred on the coast of Spain during the civil war in that country, none of the European ironclads have ever (with the exception of a single instance) been in action. This exception was the quickly decided fight between the Austrians and Italians, in which twelve Italian armored vessels and eight wooden vessels met the seven armored and fifteen wooden vessels constituting the Austrian fleet. The Italian flagship Ré d'Italia, a wooden ironclad, was rammed and sunk by the Austrian flagship Ferdinand Max; and the Italian corvette Palestro was blown up. The Italians exhibited extraordinarily bad gunnery, and the Austrians won an easy victory. This battle, however, furnishes no useful lesson, unless it is to show how difficult it is to manœuvre a ship so as to render her ram effective against an enemy who manœuvres equally well to get out of the way; for the Austrian could not ram the Ré d'Italia until the latter had had her rudder disabled. The conflict mainly, however, is an instance in point, exemplifying the fact that the conditions determining success in battle are not to be gained by providing a preponderance of ironclads in one opposing fleet; nor can the fortunes or misfortunes of vessels be invariably provided for by the skill of the naval constructor.

The two fleets which are soon to serve as targets for each other, and thus, at the cost of much blood and money, to furnish data of inestimable value to the war-shipbuilder of the future, are quite evenly matched, as far as ironclads are concerned. Russia has 29 armored ships, and 196 other vessels of all classes, carrying altogether 521 guns; 27 of the first mentioned vessels are in the Baltic, and 2 are in the Black Sea. Of these, the recent report of Chief Engineer J. W. King, U.S.N., on European ships of war, whence we take our facts, says that but two, the Peter the Great and the Minin, approach the modern standard of fighting efficiency. The Peter the Great's armor is 14 inches in thickness, with iron hollow stringers on the backing besides, which are alleged to give an additional resistance equal to 2 inches of iron. The four guns, two in each of the turrets, are steel breech-loading guns on the Broadwell system, of 12 inches caliber. She has no ram. Her length is 321 feet, breadth 64 feet; displacement 9,510 tons. She has twin screws, and a maximum speed of 13 knots. The Minin is 298 feet long and 49 feet broad, and displaces 5,650 tons. She carries four 11 inch guns, and 12 inches of armor on 24 inch backing. She is a rigged turret ship on the Coles system, but is undergoing alterations which will place her guns on two turntables on the main deck, so that they fire *en barbette* over the top of the battery. Next in importance are the broadside vessels Duke of Edinburgh and General Admiral. These are of iron, wood-sheathed, and displace 4,438 tons each. Their armor is disposed in a belt over the vital parts, and is 6 inches thick by 7 feet wide. Their speed is 13 knots, and armament four 8 inch rifled and two 6 inch chase guns. Next in the sea-going fleet are four ships named after admirals, two carrying each six guns in three turrets, and two each four guns in two turrets. The caliber of the guns is but 9 inches, and the armor but 6 inches thick. Two wooden armored frigates follow, which carry large batteries of small guns and thin armor. They may be regarded as obsolete. For coast defence, Russia has the circular ironclads which we have so frequently referred to, but the efficacy of which is, to say the least, doubtful. One has two 11 inch, the other two 12 inch, guns; and the thickness of armor is respectively 11 and 18 inches. There are ten single turret monitors of the early Ericsson pattern, and the three two-turret monitors carrying 10, 8, and 9 inch guns, and having armor not exceeding 5 inches.

As against this fleet Turkey can make the following exhibit: The Mesoodiyeh and Memdoohiyeh have recently been completed in England. The first has already been delivered to the Sultan, the second completed her trial trips in January last. The displacement of these ships is 9,000 tons each, length 332 feet, and beam 59 feet. They are full-rigged frigates of the broadside central battery type, with hulls of the usual cellular construction, there being in all 82 watertight compartments. The battery is 153 feet in length, and the armor plating on the sides is 12 inches thick, backed by the same thickness of East Indian teak. The armaments are twelve 18 ton and two 6½ ton Armstrong guns. The maximum speed is 13·8 knots. Five ironclads follow, each nearly 300 feet in length and carrying 10 inches (in one case 9 inches) of armor plating. The armament of four is fifteen 6½ ton guns and one 12 ton gun; the fifth has ten 12½ ton, two 6½ ton, and 6 small, guns. Seven ordinary station service ships follow, four with armor ranging from 9 to 7 inches in thickness, and carrying each four 12 ton guns, three with armor from 4½ to 4 inches carry five 150 pounders and one 12 ton gun. Lastly come five gunboats, each carrying two 12 ton guns and 3 inches of armor, and two coast defence monitors. In all, Turkey has 24 armored fighting ships, nearly all new. She has few wooden seagoing cruisers, and therefore it is probable that no naval combats will occur elsewhere than in the vicinity of the immediate seat of war, and most likely in the Black Sea.

The Fall of the New York Post Office Roof.

The falling of a portion of the roof of the Post Office Building in this city recently killed three men, and wounded several others who were at work in a room beneath. The Acting Supervising Architect, Mr. James G. Hill, says that the roof was from 50 to 75 per cent heavier than it should have been. It carried five inches of concrete and cement at the crown of the arches, and a thickness of fourteen inches of the same materials at the deepest part, over the nine inch rolled beams. Some time ago, a portion of a brick wall, which aided in supporting the weight of the roof, was removed, and in lieu thereof a Howe truss girder was substituted. This gave way, and appears to have slipped from its inner bearing on the interior wall, and also to have brought down the plate and purlin by which the outer end was sustained. The purlin seems to be badly wrenched; but as yet it is not definitely determined where the structure first failed.

It is generally conceded that the Post Office Building, though imposing in general appearance, is of inferior architectural merit; but it has always been supposed that, as an edifice, it was exceptionally solid and strong. The Coroner has impaneled a jury of prominent architects, and the thorough investigation which the structure will receive at their hands will doubtless bring out the true facts in regard to it.

A VERY general reduction of wages is in progress among the miners and blast furnacemen of Scotland. In a number of instances the men are already working on the reduction, and in a week or two the notices will take effect at other works. As a rule, the reduction amounts to 6d. per day, which brings down the wages to a very low level. In one district it is said that the wages, even for six days' work, will not exceed $4.50, gold, per week, when the offtakes are deducted from the gross earnings.—*Engineering.*

THE address of Mr. H. R. Houghton, whose fire escape we illustrated in our last issue, is 59 West 42d street, New York city.