Correspondence.

Notes from Washington.

To the Editor of the Scientific American:

Since my last letter, several bills have been introduced in Congress, having a bearing on patent matters. One, by Henry B. Sayler, "to regulate the manufacture, use, and sale of patent right articles," enacts that every patent shall grant to the inventor, for two years only, the exclusive right; and on application before the expiration of this term, an extension of 15 years shall be granted without further payment, subject, however, to the condition that any person may manufacture and use such patented article or machine by paying a royalty of ten per cent of the market value. The same bill also allows the printing of any book protected by copyright on paying ten per cent of the wholesale market value.

A bill, introduced by Mr. McDougal, provides that no injunction shall be granted prior to final decree unless the complainant shall execute to the defendant an undertaking conditioned to pay to such defendant all damages which shall be sustained by him by reason of the issuing of such injunction, in case the court shall finally decide that said complainant was not entitled thereto; and further provides that in case of appeal from the final decree, the appellant may stay the effect thereof, during the pendency of the appeal, by executing a like bond.

Mr. Mills introduced a bill on the 18th instant to annul the patent No. 110,774, issued to T. W. Mitchell, of Fore Bend, Texas, for a cotton worm destroyer.

Another bill, introduced by Mr. Amos Clark, appropriates $100,000 to pay Montgomery & McClure for the use of their patent No. 24,947 for journal boxes, in the vessels in the United States service.

There was quite a discussion in the House on a bill to allow Norman Wiard to make a new application for an invention that has been forfeited under the two years' clause of the act of 1870. One of the members wanted to make a provision in the act that the United States should have the free use of the invention. Wiard's friends objected, and quite a spicy debate ensued, in which considerable personality was indulged in, after which the bill passed without the obnoxious clause.

One of the largest of the extensive jobs before Congress—the Atwood car wheel—has been reported unfavorably.

I understand that the House Committee on Patents decided on Tuesday last the course to be pursued with respect to the sewing machine extensions, but all information on this subject is denied.

The Senate Committee heard the argument to-day of John Pope Hodnett, counsel for the opponents to the extension of the patent of the Wilson sewing machine, when the Committee, at the request of the applicants, deferred the further consideration of the subject for two weeks. A large number of opponents were present, and much interest was manifested by the contestants.

As mentioned in my last, Mr. Sutro is giving a series of lectures on "Mines and Mining," but devoted mainly to a description of the Comstock lode, the Sutro tunnel, and the advantages that will result therefrom on its completion. These lectures are illustrated by a large number of photographic views, which are exhibited by the aid of a stereopticon and the calcium light, and, being free to all, are tolerably well attended.

The Sutro tunnel is designed mainly for an immense drain to carry off the water which is constantly accumulating in the mines of the Comstock lode, and also a means for removing the ore and providing proper ventilation to the mines. To thoroughly understand the importance and necessity for the tunnel, it will be advisable to give a brief description of the Comstock lode: This celebrated mining district is found at the foot of Mount Davidson, in the Washoe Mountains, and appears to have been formed by some terrible convulsion of Nature, which caused the separation of the surrounding greenstone formation from the mass of rock forming Mount Davidson, leaving a fissure, which became filled in the course of time with argentiferous rock and is now known as the Comstock lode. It was discovered by some poor miners, who were prospecting for gold, of which they had washed out a small quantity, but in washing were troubled by what appeared to be a heavy black sand, which they could not readily separate by the ordinary process, and which was consequently a great difficulty in their way. Happening, however, to subject some of it to the action of fire, they discovered that it was silver. Previous to this discovery, they had thrown away about five thousand dollars worth of this black sand. Directly after this the lode was quickly covered with claims, and mining has been pursued with so much success that about two hundred million dollars worth of silver has already been taken from it.

One of the greatest hindrances to the profitable operation of these mines is found in the immense quantities of water collecting in them, which requires a large number of very powerful pumps to keep them going, and in the difficulty of supplying fuel for the engines employed for working these pumps and raising the ore (of which there are not less than sixty on the Comstock lode alone), requiring, it is said, about six hundred cords of wood in each twenty-four hours. This wood has to be brought to the mines over a railroad which is probably the crookedest railroad in the world, as it pursues a waving course of twenty-three miles to reach a distance of about four and a half miles, owing to the necessities of the grade, there being something near twenty-five hundred feet rise in that distance.

The expense of operating this railroad, most of the fuel, and the great danger and delay caused by the mishaps to the pumping apparatus, whereby the mines are liable to be flooded, will be saved by the tunnel which Mr. Sutro is running to connect with the mines. It stands at a distance of over four miles from the lode, at a point more than two thousand feet below its upper surface, and is intended to run in a westerly direction until it strikes the lode, after which main branches will be run north and south, parallel with the lode; and from these main arteries smaller branches will be driven in various directions to connect with such mines as may be off the principal lines.

The main stem is now being run in and reaches about six thousand feet. Its length is rapidly increasing. There are four shafts, to increase the facilities for working, ventilation, etc. The first of these is 525 feet deep, and the second 1,042, both of which are completed, and the first has been drifted towards the mouth until it met the drift coming from it, so it is now in communication with the mouth. The third would be 1,385 feet deep if completed, but, owing to the immense influx of water, it had to be abandoned. The fourth will be, when completed, 1,500 feet, of which over 700 are now done.

The bottom of the tunnel will form an immense sewer or drain, above which will be placed a double track railroad to convey the mineral to the mouth of the tunnel, which being on a down grade will require very little power to operate. The water issuing from the tunnel will be used to drive immense reduction works conveniently situated at its mouth, and, after doing its duty there, will be employed in irrigating the land surrounding the town of Sutro.

In all those mines not sunk below the bed of the tunnel, the immense expense entailed by hoisting ore and pumping water will be avoided. A few figures will give some idea of the large amount of material to be raised. According to Mr. Sutro, 1,000 tuns of waste rock and 2,000 tuns of ore are raised each twenty-four hours; and with each tun lifted, five tuns of dead weight are raised, namely, cable four tuns, and cage and car one tun each, making 15,000 tuns of dead weight, and 3,000 tuns of ore and waste rock, to which must be added 8,640 tuns of water. All of this immense weight has to be lifted on an average to each tun of silver obtained after the ore has passed through the reducing process.

When the tunnel is completed, all this amount of hoisting and pumping will cease, as the water will run out through the tunnel, and the rock, ore, etc., may be allowed to fall to the bottom, or it may be lowered in a cage and its weight utilized in raising timber and other needed supplies; and it may even, with suitable machinery, be made to assist in pumping water from those mines which have been sunk below the tunnel. The water that now collects in such large quantities in the upper parts of the lode may be used in the same manner before entering the tunnel, by passing it through turbines suitably arranged above it. In this manner such mines as may be below the tunnel will be kept dry by the same water that is now such a trouble, thus turning a curse into a blessing.

In addition to the economic advantages thus obtained, there is another feature, which is the most important in a humanitarian point of view, namely, the ready means of escape the tunnel gives in case of fire in the shafts above the miners. One fire in the Yellow Jacket mine caused the loss of forty-two miners, who were burnt and smothered to death, but might have been alive at this day had the tunnel been in connection with the bottom of the mine.

In view of these advantages, the cost of mining will be so much reduced by the completion of the tunnel that it will pay to mine for low grade ores that are now passed by as useless. It is estimated by Mr. Sutro that, of the immense quantity of ore in the lode that can be profitably worked when the tunnel is completed, only one per cent will pay for working under the present expensive system.

The idea of tunneling for drainage is no new and untried idea, for it has been practiced in Europe for hundreds of years, where mining tunnels are of a length undreamed of as yet in the United States, there being two in the Hartz Mountains, the Georg and the Ernst-August, ten and a half and fourteen miles long respectively, besides several shorter ones. A still longer one may be found at Freiburg, which is twenty-four miles in length.

OCCASIONAL.

Washington, D. C.

Aerial Navigation.

To the Editor of the Scientific American:

A sailing bird, in a calm atmosphere, spreads its wings and tail, throws its head forward, and slides downward and forward. Now, after it has arrived at the foot of the plane, if all the conditions which caused it to fall thus were reversed, it would slide upward and forward to the top of the same plane; that is, if the position of the bird were reversed, and every part of it made as much lighter than the air as it was heavier in falling, the size remaining the same, it would fall upward and forward, obeying all the laws of descent.

This same result will also be seen in many falling leaves, and especially in letting a palm leaf fan fall with its more convex side down, or by pressing the fan under water with the more convex side up; the fan in the one case will fall, and in the other rise, in the direction of the handle.

An aerial boat, built somewhat after the model of a bird while sailing, would thus sail upward and forward by reason of the surplus buoyancy, and sail downward and forward by reason of a discharge of this buoyancy, keeping the bow of the boat elevated while rising and depressed in falling, and thus in one ascent and descent a journey would be made. The angles of ascent and descent and the momentum will depend upon the amount of surplus buoyancy, the weight, and the size of the wings or resisters.

For the purposes of aerial navigation, we are at the bottom of a boundless sea; and in a boat constructed as I suggest, with surplus buoyancy, we will be pushed upward, and with weight we will be pushed downward, the forward movement depending upon the form of the boat and of the resisters, and on the elevation or depression of the bow, as stated. In a very imperfect model, I have secured, in a hall, a forward movement of thirty feet in rising or falling eight feet.

As this idea is new to me, I would like the opinion of some practical aeronaut as to its probable utility.

LEE.

Wilkes Barre, Pa.

Combining Steam Engines and Water Wheels.

To the Editor of the Scientific American:

In an answer to N. P. S., page 363, issue of June 6, in regard to using a steam engine to assist a water wheel, it is advised to "use each separately, and divide the work to be done between them." In ninety-nine cases in a hundred this could not be done.

Wherever more power is needed, either constantly, or at seasons of low water, or when variable work is being done, a steam engine may be attached to the line shaft which leads from the water wheel, by means of its main band passing over a pulley on said line shaft (situated as near the wheel as practicable), said pulley to have such diameter as will permit both the engine and the water wheel to make each its own regular speed. The effect of this is as follows: When the supply of water is ample for the work, the governor on the engine will shut off its supply of steam or nearly so, and the steam will be retained in the boiler, little fuel being consumed. But when the supply of water fails, or the work is greater, for longer or shorter intervals of time, the speed of the water wheel is decreased, when this governor instantly opens the steam upon the engine, which in turn supplies just the amount of power needed to supplement and maintain the requisite speed of the line shaft. So that, as long as the power from the water wheel is sufficient to overcome its own friction and that of the line shafting, so long will its own water be utilized, even when it would be insufficient alone to accomplish any work at all beyond overcoming said friction.

HORACE L. EMERY.

Albany, N. Y.

Steam Pressure on River Steamers.

To the Editor of the Scientific American:

I am glad to see, by your issue of June 6, that Mr. Little has called attention to the excessive steam pressure allowed tow boats on our rivers. I am informed that the new law allows an increase of steam pressure on our passenger vessels of 20 per cent for single-riveted boilers; in other words, instead of requiring one sixth of the tensile strength of the iron for the working pressure, it allows one fifth.

Under the present law, a cylindrical boiler, ¼ inch thick, 40 inches in diameter, of 60,000 lbs. tensile strength, single-riveted, is allowed a working pressure of 125 lbs to the square inch. By the new law it will be allowed 150 lbs.

If this be the case, we are going backwards. I have for many years investigated this matter of boiler explosions on our western steamboats, and am prepared to say that I do not know of a single instance (except in some cases where the flue collapsed) that the cause could not be traced to either the boiler being too weak or the steam too strong. Some of the oldest and most experienced river men have expressed the opinion that 100 lbs. per square inch should be the maximum. It is a matter of mere dollars and cents. By increasing the size of the cylinder, you reduce the pressure in the boiler, and the boat will run just as well. This has been tried.

JAMES F. NOBLE.

Cincinnati, Ohio.

New Local Anæsthetic.

To the Editor of the Scientific American:

Noticing a paragraph with this heading in your issue of May 30, detailing the action of camphor rubbed up with a few drops of spirit in connection with chloral hydrate, it occurred to me to call the attention of your chemical readers to the action of chloral hydrate on gum camphor when brought in contact in the solid state. If a piece of gum camphor be placed in a phial in which there has been previously placed an equal amount of chloral hydrate, each substance begins slowly to deliquesce, forming a very limpid, viscous, and highly refractive liquid. In the course of a few hours, the solution of the two solids will be complete. I have used this camphor chloral, or chloral camphor, as a local anæsthetic in neuralgia, and also as an anterotic and hypnotic in the chordee of blennorrhagia with considerable success. I should be much pleased to have some of the many able chemists who read your paper examine and report on the compound. A country practitioner in these regions has neither the means nor the time to experiment.

Osceola, Ark. F. L. J.

Fish in Alkaline Waters.

To the Editor of the Scientific American:

The disastrous effects of alkali, with which our water it strongly impregnated, upon the finny tribe was strikingly illustrated during the past winter, when the thermometer ranged as low as 41° below zero Fah. The lagoons adjacent to the Humboldt river vary in depth from two to four feet at this season of the year, and are well stocked with fish. During the past winter, ice formed on many of them, 20 inches in thickness; as a result of the freezing process, the alkali was precipitated and formed so strong a solution that both fish and frogs all perished.

F.

Elko, Nev.