

**The Great Trans-Continental Railway Line.**

We have published several articles describing the object and mode of construction of the great railway line from Omaha, Nebraska, on the Missouri River, to Sacramento, California. The line has, however, been generally mentioned under the title of what may be considered its eastern division, the Union Pacific Railroad, while in fact there are two companies, the one at the western end being known as the Union Pacific; and this company is building the road from Sacramento east to Salt Lake.

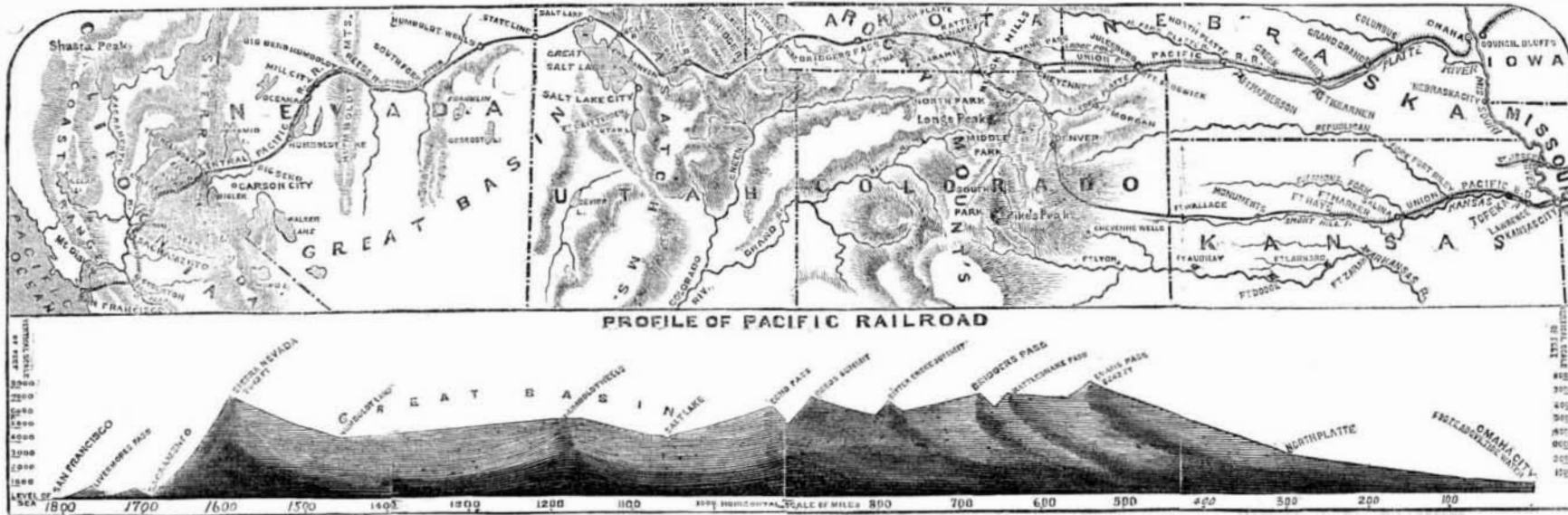
By the map which accompanies this article, it will be seen that this company has completed over 160 miles of the road, having reached the summit of the Sierra Nevada. The serrated lines show the roads as built, and the smooth lines the route and length of the unfinished portion; except that the former do not extend quite far enough to show the amount

stone vaults, increasing every day in value, and destined some time to tickle the palate of the epicure. Here is also to be seen a fine fragment of an old Roman amphitheater, built in the days of the Emperor Gallienus, and capable of holding 15,000 people. Its solid walls and massive arches attest the substantial character of Roman architecture, and seem likely to stand, while more modern structures crumble and fall to dust.

For a distance of sixty miles beyond Bordeaux the railway passes over a wide desolate plain of shifting sands, whose soil, cold, wet, and barren, barely supports a thick growth of briary shrubs, and some dwarf pitch pines, which supply the government with resin and turpentine. Upon the open treeless portion of these plains sheep are pastured to a considerable extent, tended by shepherds who walk upon stilts, and from this perched-up position they can overlook

since. The inhabitants are delighted to show the house where their Majesties passed the bridal night, previous to setting out for Paris.

Returning to Bayonne, the birthplace of the bayonet, a strongly fortified city, the key to the passes of the Pyrenees on the west, we took a carriage and rode over to Bairritz, a distance of six miles, the imperial salt watering place, where the Empress Eugénie and her husband Louis have a fine villa close to the seashore. The Empress has also erected a little chapel within the enclosure of the surrounding grounds, and is very justly regarded by the people as a kind-hearted and pious lady. The splendid and well shaded roadway was thronged with mules and donkeys, with immense panniers thrown across their backs, and it was no uncommon sight to see a female seated upon these venerable animals, with her feet hanging astride the neck. A donkey, when thoroughly loaded as I



**THE CONTINENTAL RAILROAD—MAP AND PROFILE MAP OF THE LINE FROM OMAHA TO SAN FRANCISCO.**

completed at the time of publication of this issue of the SCIENTIFIC AMERICAN. The Union Pacific Road is expected to be completed to Evans Pass, a distance of 555 miles from Omaha, by January 1st, 1867.

This point is the highest elevation on the route, as may be seen by the profile of the road.

The preliminary organization of the Union Pacific Railroad Company was made in October, 1863. The first contract for construction was made in August, 1864; but various conflicting interests, connected with the location of the line, delayed its progress, and the first forty miles were not laid until January, 1866. At that time all obstacles were removed, and the road has been built more rapidly than any other similar work in the world. There were 305 miles completed on the 1st of January, 1867, and contracts have been made for rock cuttings, to be done during the winter. The work on the California end of the route is being pushed forward with great energy toward the east, and it is expected that the whole grand line to the Pacific will be open for business in 1870. The present outfit of the company comprises ample depots, stations, car and repair shops, and all the equipments of a first-class road. It has now in use fifty-three locomotives, twenty passenger and mail cars, and seven hundred and ninety-three freight cars. The financial condition of the company is fully exhibited in an advertisement in another column.

**EDITORIAL CORRESPONDENCE.**

*From Paris to Madrid—The Character of the Country—Bordeaux and its Wine—Pau and its Climate—The Spanish People—Agriculture, Manners, Customs, Towns, and Cities—A Spanish Railway.*

MADRID, November 18, 1867.

The troubles in Italy have turned the tide of continental travel toward Spain, and although this old dominion is familiar to most American readers by the writings of Prescott, Irving, and Ticknor, yet few comparatively of our countrymen ever visit it. A railway is now complete from Paris to Madrid, and thence to Cadiz, at the utmost southern verge of the Peninsula, with connecting links to Barcelona, Alcanté, Carthagena, and Malaga, on the Mediterranean, to Lisbon, in Portugal, and to Bilbao, Santander, and St. Sebastian, on the north. The express train runs from Paris to Madrid in forty hours, but those who wish to perform the journey in an easy and comfortable manner will not omit to stop for a short time at the interesting old city of Tours, and thence on to Poitiers—both of which are filled with thrilling incidents connected with the life and times of Louis XI., Catharine de Medicis, and other great characters who have so swayed for good and evil the history and destiny of France.

A day spent in Bordeaux will well repay the time. It is a large thriving city, and stands literally above vast catacombs of wine and brandy barrels. Its noble river, the Garonne, throngs with vessels from all parts of the commercial world, and is spanned by a massive stone bridge of 1,596 feet in length, supported upon heavy piers, the finest structure of the kind in France; the quay extends along the banks of the river for a distance of three miles, and presents a busy scene of rumbling wine carts, and a strange mixture of peoples and tongues. We visited the wine cellars of one of the largest firms in the trade, and were conducted through cellars and passages lined with hogsheds and stacks of bottles filled with the choicest vintages of the country. We noticed tier upon tier of bottles covered by the accumulated mold of a quarter of a century, quietly reposing in iron frames or

their flocks, and prevent them from straying.

In appearance, one of these peasant shepherds resembles a tall man upon two wooden legs; and so expert are they, that by the aid of a long pole, they can clear the country with the rapidity of a horse at full trot. They suffer great privations, and are short-lived; but they are Frenchmen, and prefer this nomadic life rather than emigrate to a land of plenty. Statistics show that in 1864 less than two thousand Frenchmen permanently emigrated from their much-beloved country.

From the old town of Dax—so famous for its dry bracing air—a branch road runs to Pau. The country all along this route is very beautiful and generally fertile. A most charming feature of the landscape is the well-fenced farms with noble farmhouses and outbuildings located thereon, the same as in our own country. It was pleasant also to see roses blooming in the gardens, and the farmers with their carefully blanketed oxen engaged in plowing, sowing, and other agricultural labors. I enquired the reason why working cattle when at work were kept covered with blankets, but no good reason could be assigned beyond the fact that the custom was immemorial—descending from father to son. As in other European countries the yoke is fastened to the heads of the oxen by means of straps wound around the horns, which seems to me a system of cruel torture, but it is old, and as custom among farmers in Europe appears to be arbitrary it would be useless to reason with them; that the yoke upon the shoulders is far better than the one which they have inherited. Be it said however to the praise of the inhabitants of the Basse Pyrenees, the men instead of the women perform the labors of the field. Why is this? Simply because they have a better and more advanced civilization, for which they are mainly indebted to King Henry of Navarre, and to Margaret of Valois, who were not too bigoted even in those rude times, to listen to those who led the vanguard of freedom from ecclesiastical tyranny and oppression, a work that is now rapidly advancing throughout all Europe, and will continue to advance proportionately as the minds of men begin to think and act upon intelligent and independent convictions.

Pau has a fine old castle, where good King Henry IV. was born, Dec. 13, 1553. The apartments are grand, and, strange to say, cheerful—a comfort which is usually wanting in all other kingly palaces that I have visited. The royal bed, and the tortoise shell cradle wherein His Highness was rocked, are still preserved among the curiosities of the castle. From the high tower where Margaret of Valois gave asylum to John Calvin, and listened to his stern preaching, a grand view is had of the Pyrenees and surrounding country. An other old tower was used alternately to imprison Romanists and Reformers, but history does not inform us that "pure religion and undefiled" was ever advanced by prisons and persecutions. Pau, which ranks as one of the healthiest spots in Europe, is a place of great resort for consumptives. Their wasted, tottering frames are seen moving about the streets, receiving temporary inspiration from the bracing air, but only to add, it may be, a few more days to their lives. The constant presence of so many "sick, lame, halt, and blind," in this beautiful and healthful spot, of course detracts from its pleasures to those who, more happily circumstanced, might desire to remain and enjoy the fine scenery and the charming excursions through the neighboring mountains. A few miles beyond Bayonne we stopped at the old town of St. Jean de Luz, where Louis XIV. married Maria Therese, the Infanta of Spain, daughter of Philip IV., in 1660. In honor of this event, the authorities of the town closed the door through which the royal pair entered, and it has remained shut ever

have frequently seen them, affords a most grotesque sight, as often under a pile of bags or brush, nothing of his corporeal frame is visible except the ears, nose and feet.

At the poor, miserable town of Irum, we reached the Spanish frontier, where baggage is searched and cars are changed. The gage of the Spanish railway is a few inches broader than the French, so constructed in order to prevent the running of cars across the border in time of war. The examination of the Spanish officials is very strict, and an armed guard is maintained at all the stations, who search the trains, and lynx-eye all the passengers to discover concealed weapons, and, if possible, to detect revolutionary design. After a delay of an hour and a half, we set out on our journey toward the interior, thankful that we had escaped with so little annoyance. We were permitted to enjoy the complaisance, however, but for a brief period, for on reaching Miranda, a station some six hours journey from Irum, our baggage was again thrown out of the car, and underwent another examination, and one of the guards entered our car and commenced searching under the seats and carpets, and ended his investigation by pounding vigorously upon the cushions and upholstery. Nothing of a warlike character being discovered, we were permitted to pursue our journey in peace until we halted for the night. The recent attempt at revolution in Spain has excited the authorities to an excessive vigilance, and strangers are looked upon with suspicion. The night of our arrival at Burgos, the train bound for Paris was attacked by a band of brigands, who expected to plunder a large amount of bullion belonging to the government, but they missed the prize. The engineer, however, was killed, and some depredations were committed upon the passengers. We saw one of the brigands being marched through the streets of Burgos the next day, on his way to prison, escorted by two armed guards.

Our first night's experience in Spain was had at Vitoria, an old, wind-blown, weather-beaten city, containing about seventeen thousand inhabitants. Vitoria is historically celebrated as the spot where the Duke of Wellington, in 1813, encountered the forces under Joseph Bonaparte, who was the acting king of Spain. Joseph was badly whipped and ran off, leaving an enormous amount of plunder in the hands of the Iron Duke. This victory resulted in the final expulsion of the French from Spain. The town has the usual Spanish Plaza, with very narrow streets, which emit the foulest odors, through open gratings of cesspools that receive all the sewage of the houses, without the necessary draining. No carriages or vehicles of any sort are seen upon the streets, except a few ox-carts, having solid wooden wheels bound by a thick iron tire, and a few iron straps on the sides. In some cases a thick wooden rim, or double felly, secured by pins, is used in place of iron. The water necessary for domestic purposes is collected at the public fountain in the Plaza, in large water jugs, such as the woman of Samaria brought to the well, and these are carried either upon the heads of women or the backs of donkeys. The priests are numerous, and are really the only fine looking men I have yet seen in Spain. They have usually pleasant, intelligent faces, and walk about the streets with great dignity, clothed in their flowing black cassocks and broad-brimmed, turned-up hats. They enjoy the cigarette, and in one instance we noticed a group of them descending the steps of San Miguel after morning mass, puffing the smoke of these little paper rolls. The moment the Spanish territory is entered, the observing traveller notices a complete change, not only of language but also in the appearance of the people, manners and customs, as well as in the character of the country itself. The French are gay,

light-hearted and cheerful and fond of amusement, and particularly polite and attentive to strangers. The Spaniard, muffled within the folds of a huge cloak, appears dull and taciturn, and being naturally suspicious, he seems reserved and manifests no interest in what is going on around him.

The towns are a fitting type of the Spanish character, and many of them have stood unchanged for centuries, apparently unconscious of the stirring activities in the world beyond, but steam and electricity have at last crossed the Pyrenees, and entered these abodes of mournful desolation, and sooner or later a newer and better civilization will reanimate them into a new existence.

The people pride themselves upon their ancestral renown, and in the Basque Provinces they claim to be the descendants of Noah and Tubal. Their antiquity is well attested by the rudeness of their agriculture and the few, uncouth implements which they employ. The plow is made of the trunk of a crooked tree with a lower branch sharpened and faced with a thin sheet of iron. The trunk forms the beam, and lies obliquely between the heads of the mules or oxen, no chains or traces being used. Heavy, ugly-looking stuffed collars are placed upon the necks of the mules, in front of which there is also a strong wooden yoke, similar to an ox yoke, but instead of bows it is provided with two long wooden pins at each end, to prevent it from slipping off the neck. This yoke is then fastened to the plow beam, or to a cart tongue, by means of a long rope twisted several times around both and then passed under the fore legs of the animals; and thus equipped the plowman holds in his right hand the upturned end, which forms a handle, and with whip in the other, the soil is thinly skimmed over, and after the corn is planted, I should judge from its sickly appearance and the thick covering of grass upon the ground that it was left to take care of itself. In some portions of Spain the plow is not used to open the green sward. It is not sufficiently heavy for that purpose, but the labor is done by men working in gangs, who use a heavy, long-tined fork or spade, which is raised above the head and forced down into the turf. They all raise the implement at the same moment, and throw it violently into the ground. Women usually follow with hoes, to break the clods—truly a curious sight, and an evidence that their claim to relationship with Noah is tolerably well founded.

The topographical character of northern Spain is somewhat peculiar. It is interspersed with bare, desolate-looking mountains, scattered about in promiscuous disorder; timberless, fenceless plains, and some apparently fertile valleys; poor villages of low stone houses or huts, covered with red tile—windows often without glass; a huge church of rough stone wholly destitute of architectural symmetry and effect; peasants dressed in fancy costume; men, women, priests, donkeys, dogs, and hogs make up the picture of a country nowhere better portrayed than by their own author of Don Quixote and Gil Blas. The domestic architecture of Spain belongs to a ruder age, but the country is especially distinguished for the grandeur and magnificence of its ecclesiastical edifices, as also for its many interesting remnants of walls, towers, and fortifications of the Roman, Moorish, Gothic, and Castilian periods. For example, in the dull, decayed old city of Burgos, a place of less than twenty thousand inhabitants, there is an old cathedral erected by King St. Ferdinand in the thirteenth century, which is one of the most sublime Gothic structures to be found in Europe, and strikes the mind of every beholder with wonder and astonishment. The exterior effect of this noble building is much injured by its unfavorable location and the mean buildings which have been erected close to its side walls. Nevertheless the principal front is exceedingly fine and the spires and pinnacles rise most beautifully in richly carved open work, so that on a clear night the stars may be seen glittering through them. The interior is in the form of a Latin cross, 300 feet long, 213 feet wide, and 193 feet high. Independent of the magnificent central nave with its elaborate ornamentation and fine retablo, or high altar, there are two lateral naves and fifteen distinct chapels, some of which are as large as an ordinary church; besides these there are also extensive cloisters, and other church appurtenances, the whole containing fine tombs, sculptures, and paintings of ancient date.

At the time of our visit morning mass was being celebrated in all the chapels and also at the high altar by upward of twenty priests and groups of worshippers, chiefly women veiled in black, were kneeling upon the cold marble pavements, and so far as the outward eye could discern they were offering up devout prayer either at the shrine of the Virgin or before a carved embodiment of a suffering God.

There are several very curious relics in this cathedral which are held in high veneration by the inhabitants of Burgos. For instance they have the Christe de Burgos, a wooden image of Christ which was, according to their traditions, carved by Nicodemus, a ruler of the Jews, shortly after he and Joseph of Arimathea had buried our Lord. It was rescued from a box found floating in the sea. The hair, beard, eyelashes and thorns are real, and the image is said to sweat on Fridays, and even to bleed on certain occasions. The image is dressed up in an embroidered petticoat after the modern fashion. There is also an image of St. Cecilia, a recumbent figure, to which is ascribed the special virtue of curing aches and pains about the head. The devotees of this saint bring their tresses to the shrine under the belief that by so doing they will be cured of the headache. This faith in the virtues of a wooden saint is much more sensible than the more common one that resorts to the advertised nostrums of quacks, which flourishes no where so extensively as in our own country. Here is also to be seen the famous old trunk of Mio Cid, the legendary hero and poet of Spain, who being short of money to prosecute his campaign against Valencia resorted to the sharp financial dodge of filling the box with sand and

pledging it as so much gold to the Jews for a liberal loan of hard cash. The bones of the Cid and of his faithful heroic wife Jimena are carefully preserved in a walnut case. The dust is corked up in a beer bottle and is shown to strangers in a room fitted up as a chapel in the old town hall. In this same building is also preserved the first throne of the kings of Castile, a very common old wooden arm chair. Burgos has several very extensive monasteries and convents which are no longer permitted to flourish in Spain as in former times.

At Valladolid, formerly the capitol of Castile, once an imperial city, now much reduced in circumstances, we visited the old house where Christopher Columbus died May 20, 1506. It is a plain two-story building, stucco front the lower story striped to imitate stone, the upper painted to imitate columns with scroll work capitals. On the outside just above the door a carefully sculptured medallion has been inserted which represents the head of Columbus, a globe, anchor, scroll, and a horn of plenty. Underneath are the words "Aqui Murio Colon," "Here died Columbus." A large old building called the Audiencia, now used as a court house, contains the room where Ferdinand and Isabella were married Oct. 18, 1469. It is a very plain apartment with an altar at one end before which it is supposed that the royal couple pledged their marriage vows. Phillip the II., of Spain, was also born here in an old brick palace now deserted and opposite to this is the house once owned and occupied by the learned Gondomar, who was ambassador of Philip IV. to the Court of James I., King of England. The poor old dwelling of Cervantes, author of Don Quixote, is one of the lions of the place and bears his sculptured head. Valladolid is an interesting spot to all Americans, but very few even of those who travel in Spain ever take the trouble to visit it. Like many other Spanish cities its ancient glory has departed, and it appears to have retired from active business.

The railway between Irun and Madrid is a stupendous piece of engineering, and but for the enterprise, skill, and capital of a French company, Spain would have remained isolated, a sort of political fossil whose glory reverts to the buried centuries of the past.

There are upward of seventy tunnels on the line, of which one that pierces the Guardarama mountains is three thousand feet in length, cut through granite mixed with gneiss and other crystalline schists. The cars are comfortable and good order and regularity are as well maintained as upon European lines, in spite of the grumbling tourists and letter writers of England, who, according to John Murray, do more growling than any other traveller. S. H. W.

#### The Patent Office.

With the additional force of newly-appointed examiners, and the extra hours of duty performed by all the examiners, the accumulated work of the Patent Office has been nearly brought up. There are now but few classes that are more than a few weeks behind in examination, while most of the rooms are entirely cleared of back cases.

As an indication of the enterprise of the Patent Office, see the long list of patents reported in these columns every week. We received from Washington by a single mail last week official circulars of allowance of FIFTY-ONE patents, all solicited through this office.

#### MANUFACTURING, MINING, AND RAILROAD ITEMS.

The percentage of female operatives to males, in all the mechanical operations carried on in this city, is 37-18; in Philadelphia, 44-81.

It is stated that Mr. Winans of this country has proposed to buy the Moscow railroad, so long in the market and recently offered to the Russo-French company by the Government. He is willing to pay 25,000,000 roubles (\$19,700,000) within a year, besides undertaking to amortize a former loan.

The Turkish government is trying to turn to account its forests and mines but the want of means of communication in the interior is an almost insurmountable barrier. So in spite of the great mineral wealth of the country no one will take the mines. One forest district in Bosnia has been however sold, and is expected to yield \$100,000.

Operations on the railroad which is being built to the summit of Mount Washington have ceased for the season. A new company have been organized fixing the capital at \$200,000. A little over a mile of the road has been constructed and it is expected that the balance will be finished next year.

Crescent employs 9,950 workpeople. The blast furnaces there turn out 130,000 tons of pig iron annually, while the forges produce 100,000 tons of wrought iron in the same period.

In the ordinary method of manufacturing alloys of copper and zinc, the copper is first melted and into the molten mass the zinc is introduced in a solid state. By a late English patent it is proposed to melt both metals, pour the melted zinc into a ladle situated near the melting furnace, and afterwards pour the melted copper into the same vessel, the mixture is then stirred, and the combination takes place, the heat which is evolved in the act, raising the sensible temperature of the alloy and preventing the undue cooling which would result but for the said evolution.

A Mr. Sibert of Staunton, Va., has, it is stated discovered a process for converting iron ore directly into cast steel by a single operation in an ordinary furnace. This gentleman is now laying a number of steel rails made by this process on the track at Staunton and we may hear more from them hereafter.

Since the closing of the war the gold field of Georgia is again engaging attention. In former years the yield of gold was so large that Government established a mint at Dahlouega, Lumpkin county, in the western part of the State. Orders have been recently given to have this mint which was necessarily closed during the war, opened again. Three large ingots of gold from the Levis gold mine valued at \$4,500 the product of one week's work at the cost of \$1,100 were recently exhibited in Washington.

The process of galvanizing iron, as practiced in one of the leading establishments of Philadelphia is as follows:—Selected sheets of iron after being trimmed to requisite size and cleaned by a weak acid solution, are rolled smooth, then dried in an oven and each sheet placed in contact with zinc. Both metals are raised to unequal heat and thus fusion is effected. The regulation of the heat necessary to metallic combination is a point of nicety and care.

The highest elevation ever reached by the railroad is a point on the Pacific road, 8,340 feet above the ocean level or more than four thousand feet higher than the summit of Mount Cenis.

Twelve hundred tons of steel rails have been substituted for iron ones on the Boston and Providence railroad. At Roxbury they have been in use for upwards of a year, at a point when one hundred and twenty trains or locomotives pass over them daily but there is as yet no perceptible wearing away. Iron rails had to be relaid seventeen times a year at the same place.

The rapid growth of the town of St. James, in Missouri, shows what railroads are now doing in developing the country. St. James, on the line of the Southwest Pacific Railroad, was laid out in 1850, but owing to the war but few buildings were erected for several years. In 1856 the population amounted to about 1,300. Within a year past there have been erected, or put under contract, as many new buildings as the town contained last year.

About 25 miles from Santa Fe, New Mexico, is an extensive bed of coal which has been pronounced by experts true anthracite, and is so far as yet discovered the only anthracite deposits west of the Alleghany mountains.

Not less than thirty thousand French Arizans are employed in the manufacture of artificial flowers, and the trade in this line amounts in value to \$3,000,000 every year. America is the best customer of France in the articles demanding in the same time \$1,000,000 while \$800,000 worth finds a market in Prussia. England consumes \$600,000 worth, Germany is a customer to the extent of \$400,000, and Italy for somewhat less.

#### Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent new home and foreign patents.

**LEACHING TAN BARK.**—Charles Korn, Wurtsborough, N. Y.—This invention relates to a new apparatus for leaching tan bark and consists in the use of a vat which is provided with various compartments which are connected in such a manner that the tanning liquid will continually circulate through the same in any required order or succession.

**STEAM VALVE.**—R. A. Filkins, North Adams, Mass.—This invention relates to a conical valve which has a perfectly smooth lower base or face and which rests on a seat in which the channels for the steam passage are arranged. A passage is provided in the valve which when brought in line with the steam pipe connects the two parts of the same while otherwise it can be so set that the passage will be completely or partly interrupted as may be desired.

**WATER INDICATOR FOR STEAM BOILERS.**—R. A. Filkins, North Adams, Mass.—This invention relates to a device by which the height of the water in a steam boiler can be instantly ascertained without the use of faucets or taps and which, when the water in the boiler descends below a certain line, will blow an alarm whistle and notify the attendants of the fact.

**PLUMBERS' AND PAINTERS' LAMP.**—George Wanier, New York city.—This invention relates to a new lamp for creating a powerful flame similar to that produced by means of the ordinary blow pipe. Its object is to have a self-acting blow pipe and to produce a flame which can be used by painters for burning old paint on doors, etc., prior to applying the fresh paint.

**DISTILLING APPARATUS.**—Theodore Gründmann, Cleveland, Ohio.—This invention relates to a new and simple device for distilling, condensing and cooling mash, beer, cider or other suitable liquid adaptable more particularly for distilling on a small scale. The invention consists in arranging above the retort a small vessel into which the vapors pass and whence they are conducted to the cooler.

**SCAFFOLD.**—Clark Robinson, Rochester, Minn.—This invention relates to a portable scaffold which is to be used by painters, carpenters and masons, and which can be raised or lowered at will to any desired height by the parties standing upon the platform of the scaffold.

**CARRIAGE.**—Ephraim Soper, New York city.—This invention relates to a new construction of the front support of carriages and its object is to allow the application of C-springs to the front part of carriages and also the strengthening of the top bed and upper transome plate. The invention consists chiefly in the use of a front perch which is secured, or swivelled to the back bar and extends to the under side of the carriage to which it is pivoted, thus doing away with the through perch and still permitting the use of C-springs which are fastened to the back bar and top bed and from which the front end of the carriage body is suspended.

**DOOR SPRING.**—Josiah J. Mackey, South Brooklyn, N. Y.—This invention relates to a new and improved application of a spring to doors for the purpose of preventing the slamming of the same as they close.

**MACHINE FOR STACKING HAY.**—William Loudon, Fairfield, Iowa.—This invention relates to a new and improved device for stacking hay whereby several important advantages are obtained over other devices hitherto devised for the purpose and a great saving in labor effected.

**SPINDLE BOLSTER.**—Francis A. Sterry, Canton, Mass.—This invention consists in forming an annular recess in the top part of the bolster in which is placed an absorbent for the oil and also in cutting slits through the central portion of the bolster through which the lubricating oil passes to the spindle.

**HOLDER FOR HORSES.**—John P. Reynolds, Mirabile, Mo.—The present invention relates to a holder for horses while being shod which holder is constructed in such a manner and so applied to the horse as to occasion no injury to him and without the least danger of accident or injury to the person operating upon or shoeing the horse.

**TAG.**—Frederick G. Sargent and Norman H. Bruce, Graniteville, Mass.—This invention consists in so preparing such surfaces of the said metal wire as are in contact and held by the folded over paper with a coating or covering of paint or fibrous or other material suitable to allow the said wire and card paper to become firmly united and joined together with the use of glue or gluten or other proper adhesive material, and also to enable the string around such wire or metal to be similarly fastened thereto.

**LIFE PRESERVER.**—D. H. Heyen, New York city.—This invention consists in combining an elastic air-tight tube with a broad substantial belt thereby effectually protecting the air tube from injury and rendering its application to the purpose intended much more easy than where air tubes or vessels are attached directly to the body of life preservers without such support.

**COMBINATION OF AN ALARM AND LOCK.**—Ezekiel Tracy, Kansas City, Mo.—The present invention consists in so combining an alarm with a lock and arranging it in connection therewith that in unlocking the lock an alarm will be set free and sounded and thus the approach or entrance of burglars or other parties indicated to the occupants of the premises or room where the lock is applied.

**PESSARY OR SUPPORT FOR THE UTERUS.**—Mrs. Emiline T. Brigham, Philadelphia, Pa.—This invention consists in combining with a pessary which may be made of India-rubber or any other suitable material of the proper shape a coiled, spiral or other suitable-shaped spring support of a length sufficient to pass through and out of the mouth of the vagina where at its outer end it is secured to the person by straps or other suitable fastening or holding means or devices. The object of the spring support is to hold the pessary against and about the mouth and neck of the uterus and thus to support the same, the spring shape causing it to produce an elastic support thereto and one most comfortable and easy to the wearer.

**DOUGH KNEADING MACHINE.**—Samuel Emmore, Stouchburgh, Pa.—This invention relates to a new machine for mixing and working dough, and consists in the use of an axle provided with stirrers; a screw thread is formed near one end of the axle, at one bearing, so that when it is revolved it will receive a combined intermittent, rotary and reciprocating motion.

**HITCHING STRAP.**—Thomas B. Chambers, Newtown, Pa.—This invention relates to a new manner of arranging the strap for hitching horses to posts, or other stationary devices, and consists in the use of a chain or strap, secured with its ends to the rings of the bridle. The hitching strap, which is fastened to the halter, is passed through this chain or strap, and is tied to the post.

**TRANSMITTING AND CONVERTING MOTION.**—Nathaniel Thompson, Farmington, Mich.—This invention relates to a new and improved means for transmitting and converting motion, a reciprocating motion being converted into a rotary one, and vice versa. The invention is an improvement on the double rack and pinion, which is an old and well known means for imperfectly effecting the result specified, but which by this improvement is made to operate in a satisfactory manner.

**SCREEN-GUARD ATTACHMENT FOR CULTIVATOR PLOWS.**—G. Brain, Springfield, Ohio.—This invention relates to a new and improved screen-guard attachment for cultivator plows, whereby clods of earth are prevented from being thrown upon the plants, and a greater or less quantity of fine earth thrown upon or around them, as may be required.