ENGINEERING INVENTIONS.

Mr. James Manes, of Denver, Col., has patented an improved machine for pulverizing and amalgamating ores. This invention relates to a machine for extracting gold and silver from their ores or from tailings. It consists, mainly, in a series of metal cylinders placed horizontally and made cone-shaped or tapering, so as to be larger at one end than at the other, the said cylinders being provided at their large ends with detachable heads, and being arranged with the large end of one above the small end of the other, and the cylinders being connected by spouts arranged alternately at opposite ends, so that the ore travels by gravity down to the larger end of the cylinder and enters the smaller end of the next subjacent cylinder, and in each of which cylinders is arranged a rotary shaft bearing mullers, brushes, or other devices for pulverizing, stirring, and mixing the ore with mercury or other chemical as it passes through the machine.

Mr. Jacob J. Anthony, of Sharon Springs, N. Y., has patented a new and improved car truck, which is strong and durable, and has a broad spring-bearing for the car body, and which prevents undue wear of the wheels and rails at the curves of the latter.

An improved furnace for steam boilers has been patented by Messrs. Josef Nitsche and Theodor Grellneth, of Vienna, Austro-Hungary. This invention may be carried out in various ways, but the main feature in all is that a part of the air which passes through the grate and is thereby heated, is led to a passage or chamber, whence it, at a certain height above the grate, is made to meet the gaseous products of combustion before they escape over the bridge. The carbon particles which have not been consumed, or the carbon which has only been formed into carbonic oxide and otherwise escaping into the chimney, are thus again brought into contact with the oxygen of the heated air, and thus completely burned.

An improved steam engine valve has been patented by Mr. William Hopkins, of Dubuque, Iowa. This invention relates to that class of valves known as "steam actuated steam valves," that are operated by steam and not by mechanical attachments.

Mr. Robert Holbon, of Alpena, Mich., has patented an improvement in car couplings, which consists, principally, in providing the draw heads of each of the cars with horizontal draw bolts, upon which are pivoted the spring actuated bevel-headed connecting bolts, which may be simultaneously operated from either of the cars for disconnecting the same by means of double-acting tumblers.

An improved side bar for locomotives has been patented by Mr. John R. Fish, of Grand Rapids, Mich. The object of this invention is to prevent the side bars of locomotives from breaking in cold weather. The invention consists in a side bar connecting the driving wheels of a locomotive, having longitudinal strips of wood attached thereto parallel therewith to break the shocks or vibrations caused by irregularities of the track.

A breakwater for protecting harbors and roadsteads, and keeping open channels through bars at the entrances of harbors, the mouths of rivers, and in other places, has been patented by Mr. Alexander G. Follett, of Velasco, Texas.

Mr. Wendel Collin, of Pittsburg, Pa., has patented an improvement in car couplings, the object of the improvement being longitudinal a coupling which will lock automatically, and may be unlocked from the platform, sides, or top of the car. It may be used where the cars differ in height.

Mr. David Nevin, of Silver Cliff, Col., has patented an improved stamp guide for ore mills, which is durable, easily kept in order, and it provides better facilities for taking out stamps and changing and repairing guides as they wear out.

The Absecom Beacon Light.

There are a few great beacon lights on the Atlantic coast that are known by the mariner the world over. One is at Hatteras, others at Cape Ann, Cape Cod, Grey Head, Minot's Ledge, and Nantucket, and another at Absecom. This great Absecom light at Atlantic City, furnished by a Fresnel lens of the first order, which gives a mass of light six feet wide and ten feet high, burns steadily from sunset to sunrise, and can be seen from the deck of a vessel twenty miles at sea. It is a fixed white light, exhibited from the top of a tower 167 feet high, and is visible all round the horizon. To protect the tower thousands of tons of stone and huge dikes are placed on the seaside, but the washing of the waves seriously threatened it, until three years ago a pier was constructed a long distance out to sea, and since then the land has made, removing the beach hundreds of feet away from the tower and the town. About twenty-five years ago a huge package was sold by auction in New York for unpaid custom duties, and brought about $200. It had been consigned in France to a person who had never called for it. Being opened, an immense Fresnel lens of the highest order was found, and this is now the Absecom light. It had cost the Government about $11,000, and they thought it was lost. Let us make this great lighthouse a visit. Major Wolf, the keeper, lives in a modest brick building at the foot of the tower. He is a bird fancier, and has a large lattice-work house near by, with almost a hundred pigeons, many of them carriers, and some of them most amusing tumblers, while over the assemblage presides a solemn wild goose. As we signed the book a pretty little rose-breasted grosbeak, which had been caught in the netting outside the lantern, chirped merrily in its cage. Were it not for this netting the birds flying against the lantern at night might break the glass. As it is many are caught in the netting. The Major said he once caught seven brant at one time, and they had thus captured as many as 300 birds in a single night.

Let us climb laboriously up the winding stairs of the gradually narrowing tower, and count 228 steps as we ascend. It is a tough job even for the keepers who are used to it, and the climber winds around and around the twisted stairway, until he gets almost into the condition of the whirling dervish. The stairway finally comes to an end in a little room beneath the lantern, and on a level with the balcony outside the tower. Here they sit at night serving four-hour watches, and as the tower vibrates in the wind they superintend the light above. We go up into the lantern and see the wonderful construction that makes this powerful light. Imagine yourself in the chimney of a mammoth lamp, ten feet high and six feet across, the central part of the sides made of thick curved glass, and all the rest, top and bottom, of curved prisms acting as a multitude of reflectors. In the center is a large lamp with four circular wicks, arranged regularly one inside the other. Above and below are huge reservoirs of lard oil, with pumps moved by clockwork which regulate the supply. Two gallons of oil are burnt in a night to keep up this artificial sun for the mariner, which outshines any other light that has yet been adapted for lighthouse use.

The view from the top of this tower is grand. Far out to sea the haze over the water obscures the junction of the ocean and sky, but vessels spread their white sails in all directions.

Draining a Bog.

The following account of draining a bog in Holland was furnished the *Times* of London by a local correspondent:

My steps were directed to the well-known reclaimed estate of Mr. Nering-Bölger, called Principell, about two miles from the little station of Mill, on the Boxtel-Wesel Railway.

The entire estate is of 1,500 acres, and cost Mr. Nering £10,000 about twelve years ago, he having paid that sum for it when in the original bog state to the community of Mill. Mr. Nering, in the meantime, went over to North Germany and studied the methods of reclaiming bog lands as followed at or near Osnabrück and Arenberg-Meppen, and other places, and after a careful study of those methods returned home, determined to make the experiment on a bold scale. Bold it certainly was, for in addition to his £10,000 paid down as purchase-money of 1,500 acres of a treeless waste of bog, it cost him £12,000 more in draining, labor, manures, and putting up the requisite farm-buildings, including his own residence. As Mr. Nering truly told the writer, those in Holland who have the money will not enter upon experiments of this kind, and those who have not the money cannot.

The general plan of the estate has been to select 1,000 acres for reclamation, which has been done, while the remaining 500 acres are left for future operations, when Mr. Nering's convenience may permit. In the meantime he prefers to wait the result of his 1,000 acres and the experience he will gain year by year before he attempts to reclaim the remaining 500, which will also supply him with fuel for himself and the fifty men or so who work the farm for him. Mr. Nering commenced operations about eight years ago, by cutting suitable ditches and roads, all in parallelogram form, thus dividing the 1,000 acres into four divisions of about 250 acres each, and each division again subdivided into suitable plots for drainage and cultivation purposes. For each of the four principal divisions Mr. Nering built a suitable farm and outbuildings for stock, etc., and over each division he appoints a farmer, who is put upon his mettle by being made a kind of partner, his remuneration depending entirely upon the results of the land under his care. The whole estate is closely supervised by Mr. Nering himself, assisted by an intendant or bailiff. I, of course, could not see more than the springing crops which, however, seemed quite as backward as in England, many of the fields of oats and maize especially having only just been sown; but the cattle were in capital condition, and Mr. Nering seems inclined to devote himself largely to stock for the development of his estate and for present and ultimate profit. The manure of the beasts is, of course, all used in the cultivation of the land, and as the stock increases, Mr. Nering is enabled to do with less of some of the chemical manures with which he began the experiment after the methods of the Osnabrück and North German school of waste-land reclamation. The land yields capital pasture of grass and clover.

This brings me to the main point of the experiment, viz., the use of chemical manures, which is a method that has only been practicable since the great potash deposit discoveries in the Stassfurth district and Anhalt duchy some dozen years ago, or rather more. Prior to those remarkable discoveries of potash salts in various combinations, the supply of this fertilizing material was limited to costly methods and sources, which made the article too dear for agricultural purposes of this kind, and this discovery may truly be said to have come in time to revolutionize the agricultural procedure in the reclamation of bog land. The method pursued is to dig broad ditches, to drain and to divide the bog into suitable plots, and at the same time to supply the requisite amount of sub sand to put an even layer of four or five inches in thickness on the neighboring plot of bog land. Mr. Nering then spreads upon the sand after a slight working of it his mineral manures in the following proportions—viz., of kainit, which is a double sulphate of potassium and magnesium, about 240 pounds per statute acre, which costs 5s. for 200 pounds, including carriage from Stassfurth. He also uses about 80 pounds of nitrate of soda per acre, which costs him about 30s. for 200 pounds, and then he uses a fair proportion of the more costly, but necessary, phosphate of lime, which he makes himself by first buying bones at about £4 to £5 per ton, and mixing them with sulphuric acid.

Mr. Nering uses large quantities of his farm-yard manure, and finds it better to put the farm-yard manure separately on his land, because of the difficulty of evenly mixing it with the mineral manures. These latter he therefore applies as guano is sometimes or generally applied—that is by scattering it with the hand, thereby insuring a tolerably even distribution. He has experimented with various quantities of the kainit per acre, having used as much as 400 pounds per acre; but as he did not find any proportionate advantage, he of course now restricts himself to supplying only 240 pounds per acre. Mr. Nering suspects that the potash and nitrate soon pass away, from their soluble nature, into the drains, and so into the river. Notwithstanding this, he is amply satisfied with the profitable results of his experiments, which have shown a steady four to five or six per cent on his capital outlay per annum since 1875, although the latter seasons have not been propitious in Holland any more than in the British isle.

In a recent pamphlet Mr. Nering's example is cited as a notable example of the North German and Dutch method of bog reclamation, and the assertion is made that Mr. Nering had realized in one year (1875) a net profit of twenty-two per cent on his outlay. I took the opportunity of calling Mr. Nering's attention to this statement, asking if it were really true, and he at once declared that he had never realized more than the modest four to five or six per cent I mentioned before.

Any way, the truth is that Mr. Nering's experiment is a substantial success, and it is well that the error just mentioned has been discovered and rectified at a moment when the Irish land question is to the front, and when, no doubt, vast sums of the public money will be asked for and probably voted for reclamation of hogs in Ireland. It is of the first importance, therefore, that the facts should be known, both in the interests of the Irish and the other nations forming the British Isles. I especially put the question to Mr. Nering as to his opinion of the conditions requisite to a bog being reclaimable, and yielding a reasonably profitable return. He distinctly gave his opinion that the first requisite is that the land can be drained successfully, and the second that the bog is not deeper than five feet, or six feet at the outside; further, that it should rest on sand or on marl, but not on stiff yellow clay; the marl, to be spread on the surface of the bog, would weather and fall under the frosts and rains, and would, like the sand, give the requisite top-dressing upon which the chemical manures could be spread. But if the bog is more than five or six feet deep, it must be pared down to that depth before there can be a reasonable prospect of profitable reclamation, and if that can be done and the water can be drained away, the experiment, properly conducted, must be a success. Mr. Nering's land is, in fact, a mere skin of turf or bog of from one foot to certainly not more than three feet in depth, and probably not averaging more than two feet, and this rests on a hungry sand such as might have been left on the shore of an estuary.

History of the Screw Propeller.

The erection of a monument to Sauvage, who is believed to be the first to have practically applied the screw propeller to the driving of ships, has given rise in France to a discussion of the true history of the propeller, and the interesting fact has been elicited, says *Engineering*, that it was actually applied on a small scale by Leonardo da Vinci about the end of the fifteenth century. That great artist and engineer endeavored all his life to find a means of flying; and though his admirable studies on the flight of birds are well known, few are aware that he invented several apparatus for elevating man above the ground and wafting him through the atmosphere. All these solutions of the aerial problem are independent of the principle of levitation, and aim at realizing flight by apparatus heavier than the air. Among these numerous plans, which can be seen in the "Codice Atlantico" deposited in the Ambrosian Library of Milan, and also in the volumes belonging to the library of the Institute at Paris, there is the design of a large screw destined to turn round a vertical axis, beside and below which are written some notes in Italian to the effect that the thread of the screw should be of iron wire stiffened with light supports, and covered with linen cloth having its pores stopped with gum. According to the author, when this screw is rapidly turned, it mounts into the air. The design is a very rough one, but it is perfectly clear, as may be seen at page 401 of the *Comptes Rendus* for August 29. We see, therefore, that Leonardo da Vinci in all probability invented the screw propeller, and first applied it to aerial locomotion, thereby anticipating M. Tissandier in his recent application of the same device to a balloon by means of stored electricity. The latter employs bamboo for the framework of his screw, and curiously enough the Italian philosopher also suggests the use of long stout reeds. Moreover, on consulting the "Saggio delle Opere di Leonardo da Vinci," published at Milan in 1872, M. Govi finds that that universal genius had studied the effort exerted in striking the air with plates of a given size, and also invented the well-known parachute, of which a rough design is given, showing the figure of a man clinging to it.

The Tehuantepec Ship Railway.

While the preliminary works of the Panama ship canal are in progress—though, according to the imperfect information afforded, the progress is very small and the difficulties far greater than were foreseen—Captain Eads is earnestly developing his project for the construction of a ship railway across the isthmus at Tehuantepec. The abilities of Captain Eads, both as an engineer and a financier, have been too well established by the successful completion of one of the great engineering works of the world—the deepening of one of the mouths of the Mississippi—for this scheme to be passed lightly on one side, and pronounced chimerical; on the contrary, emanatiug from such a source it commands the most serious attention both in a professional and a commercial point of view; it would be at once the most original and boldest engineering work ever attempted, and if successful would have an incalculable effect upon the carrying trade of America, and to a less extent upou that of the whole world. In the United States the question is one attracting great attention, for not only is the work of M. De Lesseps generally regarded with a feeling of mistrust, and with a sentiment of jealousy also, but the route located by Captain Eads lies so much nearer the direct line of travel that it would naturally absorb nearly all the trans-isthmian traffic.

On a subsequent occasion we shall consider this point in more detail, but at present we will content ourselves with a few figures relating to the two routes. Speaking roughly the ship railway route is at the north and the ship canal at the south of the isthmus connecting the two continents, the 'ines of crossing being ahout 1,100 miles apart. This is a matter of the utmost importance, especially since Captain Eads has opened for large ships the great waterway of the United States, and converted New Orleans into a vast seaport. A ship leaving the mouth of the Mississippi for California, Japan, or China would, if intending to cross the isthmus by the canal, after passing the site of the railway, be obliged to follow the coast for 1,100 miles to reach the canal, and having crossed, pass up the coast on the western side for the same distance before reaching Tehuantepec. Thus the voyage would be necessarily 2,200 miles further than by the ship railway. This would represent a saving of about nineteen days on a round trip between New Orleans and San Francisco, and a saving of twelve days on a round trip between New York and San Francisco. Shipowners and merchants alike will understand the practical results of such an economy.

Although Captain Eads' project has not yet advanced so far upon the ground as that of M. De Lesseps, it stands upon at least as firm a foundation, and its ultimate prospects are probably far brighter, apart from its physical advantages. The concession granted by Mexico to Captain Eads is a peculiarly advantageous one, the estimate for construction is only £15,000,000, as compared with £48,000,000 for the canal, and if these figures are insufficient, the excess of cost in each case will probably be in the proportion of the estimates; the work could be completed in four years, and there is no doubt as to the amount of traffic which would await the railway on its completion. Naturally the undertaking will meet with much political opposition in the United States, but on the other hand it will meet with widespread and powerful support. The chief opponents will be those whose material interests lie in preserving railway monopolies, and preventing the carrying out of any work which, no matter how vast the national benefit resulting from them, would produce competition and destroy monopoly. On the other hand, support will come on all sides from those who desire the welfare of the country, and who also have great material interests at stake, such, for example, as the merchants of New Orleans now possess. Under these conditions we think there is little doubt but that the United States Government will accord the guarantee asked of six per cent on two thirds of the capital for a maximum term of fifteen years, subject to conditions which throw the whole responsibility on Captain Eads, and also to special advantages which would well repay them for a guarantee which they might never be called upon to redeem.—*Engineering.*

Recent Elevation of the Himalayas.

The superintendent of the Geological Survey, Mr. H. B. Medlicott, and the deputy-superintendent of the same work, have prepared a manual of the geology of India, in two large volumes. With regard to the movements producing the Himalayas the authors say: "During the interval that has elapsed since Eocene times, while no important movements, except small and partial changes of elevation, can be traced in the Peninsula, the whole of the gigantic forces, to which the contortion and folding of the Himalayas and other extra-peninsular mountains are due, must have been exercised. The sub-Himalayan Eocene beds were deposited upon uncontorted Paleozoic rocks; and, although the Himalayan area was probably in great part land at a much earlier period, there is no reason for believing that this land was of unusual elevation, while the direction of the Himalayan ranges is clearly due to post-Eocene disturbance. It will be shown, in the chapters relating to the sub-Himalayan rocks, that the movement has been distributed over the Tertiary and post-Tertiary period; and a great portion is of post-Pliocene date. Indeed, the fact that earthquakes are now of common occurrence in the Himalayas, the Assam hills, Burma, Cutch, and Sind, and that many of the shocks are severe and some violent, while the peninsula area is but rarely affected by earthquakes, may indicate that the forces, to which the elevation and contortion of the Himalayas are due, are still in action; and that the highest mountains in this world owe their height to the fact that the process of elevation is still in progress to a sufficient extent to counterbalance the effects of denudation.

"In Sind and the Suleman ranges, there is much probability that some movement took place during Miocene and Pliocene times. Some slight unconformity between beds, elsewhere conformable, and the absence of different groups in parts of the country, may thus be explained; but the principal disturbance is clearly of post-Pliocene date. To the eastward, in Burma, however, the Pliocene formations of the Irawadi valley are but little disturbed, and the Miocene beds, although contorted, are unaltered; while many of the Eocene and Cretaceous rocks are greatly changed, besides having undergone excessive disturbance and folding. These facts may, perhaps, indicate that the disturbing forces were more severe to the eastward in middle Tertiary times, and that the main action to the westward was of later date; a view partly supported by the fact that there is evidence of elevation having taken place in the Himalayas, near the Ganges and Sutlej, at an earlier period than farther to the westward. In the Simla area there is marked unconformity, due evidently to upheaval and denudation combined, between the Sirmúr and Siwalik series, and between the lower, or Náhan, group of the Siwalik series itself and the next overlying subdivision; whereas farther west, in the Northern Punjab, all the groups follow each other in apparently comformable sequence. The evidence, however, is not sufficient to prove that the contortion to the eastward is older than to the westward; and the absence of any important break in Burma is opposed to the suggestion of great movements having taken place in that country in early or middle Tertiary times.

"It is evident that the forces, to which the principal ranges in the extra-peninsular area owe their direction, have not only been exerted throughout a considerable portion of the Tertiary period, but that these forces have acted contemporaneously, at all events in the post-Pliocene period."

Antarctic Ice.

Mr. Buchanan made experiments on the melting point and amount of salt contained in salt water ice.

He came to the conclusion, from analyses of successive meltings, and the varying of the melting point, that in salt water ice "the salt is not contained in the form of mechanically inclosed brine only, but exists in the solid form, either as a single crystalline substance or as a mixture of ice and salt crystals."

He thinks that by fractional melting salt water ice might be made to yield water fit to drink, although when a lump is melted as a whole the resulting water is undrinkable.

We crossed the Antarctic circle on February 16, passing about six miles to the south of it. There was open water ahead, but the Challenger was not strengthened for ice work, and we were not ordered to proceed further south, so we turned back.

There seemed to be a deep opening in the pack here nearly due south of Heard Island.

We subsequently passed within six miles of what is marked on maps as Wilkes' Termination Land, and found that this did not exist.

Wilkes, no doubt, was deceived by the land-like appearance of distant icebergs.

It is to be noted that he merely says that he saw appearance of land here, sixty miles distant, but high and mountainous. Others have named it for him and placed it on the charts.—*H. N. Mosely, Challenger Notes.*

New Lead Process for the Extraction of Gold from Ore.

The tall chimneys of a large building at the foot of West Fifteenth street, New York city, have attracted some attention of late. An *Evening Post* reporter who investigated the building found that it contained machinery designed to extract the precious metals from ores and tailings by a new process which is said to be a great advance upon all previous methods.

Mr. Hamilton, the inventor of the process, said: "The whole thing lies in the affinity of lead for silver and gold. It was discovered, many years ago, that if into a bath of melted lead you plunge a piece of gold or silver heated to the same temperature as the lead, it will disappear so fast that you cannot see it melt. The extraordinary thing about it is that lead will melt at 630°, while silver only melts at about 2,000°; yet, if you take a bar of silver as thick as your finger, and, after heating it to 650°, plunge it into a bath of lead at 650°, you cannot withdraw it fast enough to save it; whatever part has touched the lead will have disappeared.

"The great trouble that I have experienced in my years of experimenting has been that if I crushed my ore and plunged it into melted lead it would not stay there long enough for the lead to get through the mass of ore to the metal. The ore is about thirteen times as light as the lead, so that it would rise instantly to the top. I could succeed in small quantities, but for practical working in which hundreds of tons of ore would be used every day, the difficulty of mixing together two substances of so unequal density as lead and ore was found almost insurmountable. I think that I have succeeded at last by means of a certain apparatus contained in a furnace of brick and cast iron. The lead has an ample chance to reach each particle of ore and extract all the gold and silver. Everything will be done automatically from the time the ore arrives until the lead containing the gold and silver is poured out to cool. We expect to reduce a ton every ten minutes at a cost of one dollar."

Mr. Hamilton then showed the reporter through the works, in which nearly one hundred men are employed fitting the machinery together. As about thirty-five tons of molten lead are used in this machine, it has to be of the most substantial character. The furnace for heating the ore aud the blast fires for furnishing heat are all enormous structures.

MISCELLANEOUS INVENTIONS.

Mr. J. N. Proeschel, of Milwaukee, Wis., has lately patented an improvement in firearms which consists mainly in the combination, with the usual self-cocking lock, of a concealed trigger readily projected from a small guard by a pressure of the thumb or finger. This arrangement, by doing away with the usual open guard and projecting trigger, notably diminishes the bulk and weight of the lock while increasing the safety in handling and carrying the arm. While the invention applies to all firearms, the advantages which it affords when applied to revolvers are especially noticeable. These advantages are, of course increased safety and diminished bulk.

An improved machine for treating grain has been patented by Mr. Charles T. Schramm, of Pontoosuc, Ill. The invention consists in combining an air flue and sliding screens, the flue provided with two openings and hinged plates.

Mr. George W. Logan, of New York city, has patented an improved hat and clothes rack which can be folded very compactly, and the arms of which can be raised, lowered, and locked at any desired inclination very conveniently and quickly.

An improved attachment for cloth-shearing machines has been patented by Mr. David McColl, of Cleveland, Tenn. The object of this invention is to take the curl and slack out of the selvages of cloth, so as to present a smooth, even surface to the shearing cylinder.

Mr. John Brunny, of Fort Scott, Kan., has patented an improved calf and cow weaner. The invention consists in a wire pointed at the end, bent to form a hook, a spring coil, and two angles, and having a pointed wire attached to it in line with its pointed end, the wire bent into a loop at its center, coiled around the main wire, and having its pointed ends projecting. The device is to be applied to the nose of the calf.

Anchor chains are usually connected to the shank of the anchor by a ring or shackle that is held on the end of the shank by a pin or bolt. With that manner of connection the chain frequently fouls with the anchor and prevents it from holding. Mr. John J. Moule, of Fishkill-on-the-Hudson, N. Y., has patented an improved shackle bar for anchors, which prevents anchor chains from fouling without limiting free movement of the chain and anchor.

Messrs. Daniel W. Shaw and Pleasant W. Brown, of Murfreesborough, Tenn., have patented an improved steam engine. The object of this invention is to economize steam and to cause a constant equal pressure or strain upon the driving shaft of the engine. The invention is an improvement on steam engines having more than one movable piston working in the same cylinder, each of which is separately connected with the crank shaft.

Lizzie I. Jones, of Texarkana, Ark., has patented an improved portable bath tub, which when not in use can be compactly folded.

An improved car coupling has been patented by Mr. Nicholas Barr, of Cayuta, N. Y. The invention consists in the peculiar construction and arrangement of the parts, whereby all danger of accident in coupling and uncoupling cars is avoided.

An improved lumber wagon has been patented by Messrs. John G. Seifer and John Maschek, of New Orleans, La. The invention consists, essentially, in a novel construction and arrangement of the reach and connections, whereby provision is made for extending and contracting the length of the wagon to accommodate it to long or short lumber.

An improved thill coupling has been patented by Mr. Clarence J. De Witt, of Havana, N. Y. The object of this invention is to lessen the labor and time required in removing or replacing the thills or pole of a vehicle. It consists in dispensing with the removal of the ordinary bolts, eye-pieces, and rubbers, and providing each thill or pole iron with a loop, through which the projecting end of an eye-piece is passed and secured to the thill or pole iron by a bolt passing through the thill or pole iron and secured by a thumb nut.

Mr. Hiram A. Laws, of Thompson's Station, Tenn., has patented an improved car coupling provided with a lever having double hook at the front end, a fulcrum near its rear end, with a shoulder against which rests the end of a spring for throwing the hooks into engagement.

An improved hoisting machine has been patented by Mr. Henry Field, Jr., of New Bedford, Mass. The arrangement of the parts of this elevator or hoisting machine is such that, by means of a continuously rotating wheel or pulley and link-and-lever mechanism, and friction and clutch mechanism, the action of the machine and the weight will always be under sudden and easy control with the outlay of very little power upon the governing lever.

An improved windmill has been patented by Mr. Isaac M. Steward, of Stromsburg, Neb. The object of this invention is to insure a uniform speed from a variable wind, and also to cheapen the construction of windmills, and economize space.