TELEGRAPHING WITHOUT WIRES.

The *N. Y. Herald* publishes a long cock-and-bull story from a correspondent at Tonawanda, N. Y., detailing the marvelous discovery of a young man "of modest mien" in that town, of the name of James H. Mower. The invention purports to be an electrical screw or a method of telegraphing without wires. The account states that, after going through secret studies of electricity, chemistry, and all the sciences for three years, during which he encountered difficulties the mere mention of which would occupy two columns of our paper, this modest young man emerges from his obscurity and makes a trial of his invention on Lake Ontario with a pair of the newly-discovered apparatuses. These were each sunk in 25 feet of water, and placed 25 miles apart, in an exact mathematical straight line, extending precisely east and west. The parallel was obtained from the most accurate surveys by a skilled astronomer, because the slightest variation from the true line would have been fatal to success. The precise nature of the apparatus used is not stated; but we are told that, by means of a remarkable electrical machine of his own getting up, "but of too intricate a character to be described here," he generates an immense quantity "of a fluid of astonishing qualities, possessing all the desirable requisites to a quick and thorough decomposition of water."

"On the 10th of July, everything was got in position, the weather being calm and the water smooth. A scow from which to operate was anchored at each end. He then commenced to generate a powerful stream and an immense quantity of the decomposing fluid, which he stood ready to let loose upon the susceptible medium, a hundred radiating agents converging to a common center, all charged with electricity, and which were only waiting for the needed touch to speed the fluid upon its impulsive errand. At seventeen minutes past two o'clock he handled the operating screw and sent the following dispatch:

"'J. B. SPEARMAN—
"'Success at last is mine. JAMES H. MOWER.'

"At nineteen minutes past two o'clock, back came the response:

"'MR. MOWER—
"'The world will acknowledge your triumph. J. B. SPEARMAN.'

"Two hours were then spent in uninterrupted communication upon matters relating chiefly to the apparatus, its operations and disposition.

"As to the whole evolution of dispatching messages through water, using it as the only medium, without the aid of any wire or insulated conductor, it may be explained thus: The water at the point of contact with the fluid is decomposed in the first drop, when the chemical separation advances to the second globule and there effects a like change, communicating the evolution to the third, and so on in the line of transmission, always in the same stratum of water. Why this line of invariable decomposition is always east and west, Mr. Mower, as I remarked before, will not now disclose.

"It is impossible to overestimate the importance of this discovery—a discovery which will establish a perfect gridiron of ocean telegraphs between our Atlantic coast and Europe on the one hand, and the Pacific coast and China on the other. Obscure islands in the most neglected corners of the earth will be able to hold converse with civilization, and soon receive her quickening breath of industry and art. Every respectable seacoast newspaper can open its own channels of communication at an expense insignificant when compared with the present transatlantic rates. A thousand benefits will accrue to mankind, and it is hoped that, in their full fruition, the name of Mower will not be forgotten, for he has, indeed, electrified the world."

The suggestion of a telegraph without wires is very old. Our modest young man might have saved himself the labor of writing up his silly yarn, and given the pith of his story in much better style, by quoting, as follows, from Addison's article in the *Spectator*, published over 150 years ago:

"Strada, in one of his prolusions, gives an account of a chimerical correspondence between two friends, by the help of a certain loadstone which had such virtue in it, that if it touched two several needles, when one of the needles so touched began to move, the other, though at never so great a distance, moved at the same time, and in the same manner. He tells us that two friends, being each possessed of one of these needles, made a kind of dial plate, inscribing it with the four and twenty letters. They then fixed one of the needles on each of these plates in such a manner that it could move round without impediment. Upon their separating from one another into distant countries, they agreed to withdraw themselves into their closets at a certain hour of the day, and to converse by means of this their invention. Accordingly, when they were some hundred miles asunder, each of them shut himself up in his closet at the time appointed, and immediately cast his eye upon his dial plate. If he had a mind to write anything to his friend, he directed his needle to every letter that formed the words which he had occasion for, making a little pause at the end of every word or sentence, to avoid confusion. The friend in the meanwhile saw his own sympathetic needle moving of itself to every letter which that of his correspondent pointed at. By this means they talked together across a whole continent, and conveyed their thoughts to one another in an instant, over cities or mountains, seas or deserts."

Here is an almost exact description of Brett's needle telegraph as used for twenty years past in England, the essential difference being that, in order to make the two separated needles sympathetic, Mr. Bett is obliged to keep them constantly connected by means of a telegraph wire.

Rules for the Strength of Boilers.

The "Useful Information for Railway Men," written by Mr. W. G. Hamilton, for the Ramapo Wheel and Foundery Company, among many other valuable items of information, gives the following, regarding steam boilers. For the cylindrical parts:

To Find the Working Steam Pressure Due to a given Diameter, Thickness of Plate, and Quality of Joint:—RULE—Multiply thickness of plate in inches by 2, and by the working strength of the longitudinal joint in pounds, per square inch, and divide by the diameter in inches; quotient is working steam-pressure in pounds, per square inch.

To Find Thickness of Plate, Due to a given Diameter, Quality of Joint, and Working Pressure:—Multiply the working pressure in pounds, per square inch, by the diameter in inches, and divide the product by the working strength of the longitudinal joint in pounds, and by 2. The final quotient is the required thickness of plate in inches.

The ultimate or bursting pressure is five times the working pressure.

To Find Working Steam Pressure, Due to a given Diameter of Tie-Rod, and Area of Segment to be guarded by it:—Divide the working strength of the tie-rod in pounds, by the area of the segment in square inches; quotient is working steam pressure in pounds, per square inch.

To Find Thickness of Plates of Stayed Surfaces:—Multiply the square root of the pressure in pounds, per square inch, by the greatest distance between the stays in inches, and by .008; product equals thickness of plate in inches.

To Find Area of Segment, Due to a given Diameter of Tie-Rod and Working Pressure:—Divide the working strength of the tie-rod in pounds, by the working pressure in pounds, per square inch; quotient is area of segment in square inches. Working tensile strength of best iron rods is seven-eighths inch diameter, 8,000 pounds; one inch diameter, 10,000 pounds; one and one-eighth inches diameter, 13,000 pounds. Deduct ten per cent if the rod is reduced by screwing.

To Find Dimensions of Stay Bolts:—Multiply area supported by stay in square inches by pressure of steam in pounds per square inch; the sum divided by 9,000 equals area of stay bolts in square inches, if the stay is thickened out where the screw is cut. If the screw is cut out of the body of the stay, divide by 6,000. Where stays are secured by keys, the stay at the end should be one and a quarter diameter of the body of the stay. Depth of cutter, 1·6 diameter of stay; thickness of cutter, 0·3 diameter of stay.

To Find Working Strength of a Roof-Stay (or Crown Bar) of given Dimensions, fixed in its Place:—Multiply thickness of stay at the center in inches, by the square of its depths at the center in inches, and by 30; divide the product by the length of the span in inches; quotient is working load in tuns equally distributed, when stay is fixed in its place.

Staying Locomotive Boilers.—Fire-Box Water Spaces:—Working pressure in pounds, per square inch, being one sixth of bursting pressure; stays, three-quarters inch diameter; copper plates, one-half inch thick; iron do., three-eighths inch thick.

STAY.	PLATE.		STAYS 5 IN. APART.	STAYS 4 IN. APART.
Copper	Copper	Screwed and riveted	107	185
Iron	Copper	Screwed and riveted	160	250
Iron	Copper	Screwed only	120	190
Iron	Iron	Screwed and riveted	185	290

For low pressure boilers, at twenty pounds per square inch flat portions should be stayed at intervals of twelve inches apart.

To Find the Pressure borne by the Roof-Stays (or Crown-Bars) of a Fire-Box:—Multiply span of the roof in inches, by the pitch of the stays in inches, and by the pressure in pounds per square inch, and divide by 2240; the product is the pressure uniformly distributed, borne by each roof-stay, in tuns.

Strength of Boiler Plates and Joints:—Working strength of best boiler plates are:

Yorkshire plates, per square inch of entire section	11,000 pounds.
Staffordshire	9,000 "
American	14,000 "
American, ordinary	12,000 "
Cast steel plates	18,000 "

Working Strength of Joint per Square Inch of Entire Section:

	BEST YORKSHIRE.	BEST STAFFORDSHIRE.	BEST AMERICAN.
Scarf-welded, joint	11,000	9,000	14,500
Double riveted, double welt	9,000	7,000	10,500
" " lap joint	8,000	6,500	9,750
Lap, welded joint	7,400	6,000	9,000
Double riveted, single welt	7,300	6,000	9,000
Single riveted lap	6,700	5,400	7,800

The strain per unit of length upon transverse circular joints is only half of that on longitudinal joints; longitudinal seams should therefore be the strongest, and the double-riveted double welt joints should be used for longitudinal joints, and the single-riveted lap joints for circular seams.

Riveting for Boilers.—Table of Dimensions of Rivets, etc., for Steam Boilers:

Thickness of Plate.	Diameter of Rivet.	Length of Rivet from head.	Distance apart of Rivets, Center to Center.	Breadth of lap, single riveting.
in.	in.	in.	in.	in.
3-16	⅜	⅝	1¼	1¼
¼	½	1⅛	1½	1½
5-16	⅝	1⅜	1⅝	1⅝
⅜	¾	1⅝	1¾	2
½	13-16	2¼	2	2¼
⅝	15-16	2⅝	2¼	2⅝
¾	1¼	3¼	3	3¼

For double-riveted joints, add two thirds of the breadth of lap.

MR. RECHTEN, of Bremen, has been exhibiting the newly patented German whaling gun at New Bedford. The gun is double and very heavy, mounted on trunnions. One barrel is designed for a harpoon and the other for a bomb lance. The harpoon is said to have been thrown a long distance with great accuracy.

THE BESSEMER PROCESS---HOW ITS EARLY DIFFICULTIES WERE OVERCOME.

Before considering the conduct of the Bessemer process, i is necessary to bear in mind, 1st, that the grand value of Bessemer metal over puddled metal, is due to its being produced in a fluid state; 2d, that while cast iron is easily liquefied at a temperature of 3,000°, wrought iron or soft steel can only be kept liquid at a temperature of at least 5,000°, which is quite beyond the convenient and practicable capacities of fuel and furnace material as ordinarily employed.

For nearly a century, the partial decarburization of pig iron has been accomplished by blowing air upon (and in some cases into) a melted mass of it. But the liquidity of the mass was only maintained by contact with an intense coal fire. The combustion of the carbon by the air was so slow and so limited in extent, that the iron was rather chilled than heated by it. This was the "finery" process, and was merely preparatory to puddling; the product was still cast iron.

Some years before Bessemer began his experiments, Mr. William Kelly of Kentucky advanced the finery process by a great stride, but left it still far short of practical steel making. He blew air into the iron just smelted from the ore, and lying in the hearth of a blast furnace, and partially decarburized it, but not without the liquefying agency of the mass of fuel above. He afterwards blew streams of air into melted iron contained in a covered brick vessel or chamber, without fuel. The almost invariable chilling of the iron, after repeated experiments with various forms of apparatus, and extending over several years, led to the suspension of further trial in this direction. The subsequent success of the Bessemer process, however, revived the claims of Mr. Kelly. The precise legal status of the two inventors has not, fortunately for the public as well as for the parties immediately interested, been brought to test, the various interests having been combined.

At this point we are prepared for the inquiry—What is the Bessemer process? If the old finery did not fulfill the theoretical specification, Kelly's certainly did. Here were carbon and silicium in the iron, but all ready to leave it upon the heated appeal of oxygen; here was plentiful oxygen spread over and bubbling through it, and here was the ample heat of three thousand degrees. Still, the reactions were irregular and impracticable.

Just here, Mr. Bessemer introduced a radically new element, that made all the difference between failure and success. To describe his process as the introduction of oxygen into melted iron, is to play Hamlet without the prince. Bessemer's is not strictly a chemical process. The chemical reactions will look out for themselves, but they must have an adequate chance, and this is what Bessemer for the first time gave them, by mechanical means, viz.: the mechanical force of numerous blasts—not sluggish drafts, but roaring blasts of air, blowing the melted iron all into spray, so as to give the oxygen and the carbon hundreds of square feet of surface contact, so that every drop of iron should be enveloped with air. Thus, and thus only, the combustion is so perfect and rapid, and so diffused throughout the whole mass, that the two grand desiderata are attained—1st, the decarburization is effected without the use of other fuel; and 2d, the product is liquid and can be cast into homogeneous masses.

To accomplish these results, Mr. Bessemer developed the radically new machinery and apparatus which, with various extensions and modifications, is everywhere used. It consists principally of the converting vessels mounted on trunnions, and so shaped that the liquid metal can lie quietly in it while the tweeres (air admission) and the entrance or mouth of the vessel lie above the metal line, and so that the mouth becomes a chimney and the tweeres are brought beneath the metal, when the converter is turned upright. He also, after great trouble, developed a refractory material (chiefly silicious stone), and a mode of lining the converter adequate to the great heat and wear. The general arrangement of casting pit, ladle, ladle and ingot cranes, regulator, and other plan to be hereinafter described, were rapidly developed by Mr. Bessemer. During ten years of his first practice, he advanced the machinery of the new art to a much higher degree of perfection than has yet been attained to in the old processes.

But Mr. Bessemer had no sooner conquered this difficulty than he encountered another and equally serious one. Except when a few of the choicer irons were employed, entire decarburization left the product "red-short," or incapable of malleability at red heat, and therefore utterly useless. To stop the blowing at such a point as should leave in sufficient carbon to cure the red-shortedness and constitute a mild steel, was on the whole impracticable, because there is no adequate indication of degrees in decarburization, and the accuracy of blowing through a fixed time, would be impaired by varying heat and other circumstances. Here, then, were the impossibility of definite degrees of decarburization on the one hand, and the spoiling of the product by complete decarburization on the other hand.

In studying Mr. Bessemer's numerous patents and writings, we observe that he clearly understood this difficulty, and approached very near to its solution. Indeed, he rather vaguely described, in several patents, perhaps without seeing the end from the beginning, substantially the remedy afterwards patented by Mr. Robert Mushet.

The indications of complete decarburization by blowing air into melted iron, are as distinct as the time of day on the clock. The flame at the converter mouth suddenly decreases in volume and loses—not its own brightness, but its power of illuminating other things. But the product is valueless. Mr. Bessemer vaguely conceived, and Mr. Mushet definitely specified the finishing touch in the great art—re-carburization. A definite weight (three or seven per centum) of a pig iron, containing not only carbon but manganese (either Franklinite or

Spiegeleisen), is melted and run into the decarburized iron. At this excessive temperature—not less than five thousand degrees—the oxygen and other impurities that make the iron red-short, come out of it with great commotion, and enter into the carbon and manganese thus added, forming an intense flame and copious slag. A part of the carbon combines with the iron, thus producing steel. All this is the work of a moment, and the thorough reaction is due to the excessive temperature. The oxygen which is removed by the carbon (or chiefly by the manganese), was produced by the oxidation of some of the iron, by the blast of air. This, and the sulphur, and some other impurities, now removed by the manganese, were what made the product red short before recarburization. The steel is now cast into ingots, which are malleable at a high heat.

But Mr. Bessemer's troubles did not end here. The product was still uncertain, though often uniform and excellent. Some subtle impurity was still lurking in some obscure corner—now appearing and now retiring. To find it, Mr. Bessemer put every iron and material employed, through a costly and thorough course of chemical analysis, and so discovered phosphorus to be the arch-enemy. And to this day, irons containing above two hundredths of one per centum of phosphorous cannot be employed to advantage. Experiments to remove or neutralize it are in progress, and greater obstacles than this have been overcome. Mr. Bessemer also determined the amounts of other materials—silicium, sulphur, etc.—that affected his process, and with Mr. Mushet's assistance (satisfactorily acknowledged) has presented to the world, not merely a theory, but a perfected process and adequate machinery, for carrying it out. It will thus be observed, that however greatly the public is indebted to Mr. Bessemer's inventive powers, it owes still more to his indomitable pluck.—*Troy Times.*

BURYING ALIVE—EXPERIMENTS WITH VESTER'S PATENT BURIAL CASE.

The idea of being buried alive is one that fills the mind with horror, and the accounts which have from time to time appeared in the public prints, describing such occurrences, have always attracted the attention of a sensation-loving public. It may safely be assumed, however, that a very large proportion of the stories of the exhumation of bodies which gave signs of having moved in their coffins, are rehashes from old romances, or have their origin in the awkwardness of those who were intrusted with the interment of the remains; the indications of convulsive efforts to escape death; and other sensational details, being purely imaginative. The chances at this age in a civilized community, observing the decent rites of burial, that living bodies should be interred by mistake, is so small, that it is practically unworthy of consideration. In Germany it has long been the practice in many places to deposit the dead in mortuary houses erected for that purpose, until the commencement of decomposition shall have absolutely proved the death of the bodies deposited in them. Our editorial letter from Strasbourg, page 202, vol. XVII, contains the following description of this practice, as we saw it at Frankfort-on-the-Main, and at Munich:

"In a building at the entrance to the cemetery, the bodies are placed upon iron cots in a recumbent or half-sitting posture, and upon the wrists are fastened rings, which connect with wires and alarm bells hung in the adjoining rooms of the watchman. Each cot is numbered to correspond with the number fastened under the bell, so that in case there should be the slightest motion of the body an instant alarm would summon the watch to the spot. In an adjoining room there is a bed carefully prepared, a bath-tub, electric apparatus, and restorative medicines to be employed in cases of resurrection.

"At the time of my visit I counted the bodies of eight infants, and eight adults, all serenely reposing in a profusion of flowers, and watchmen were sitting in solemn silence awaiting the click of the bell. In Frankfort not a single case of resurrection has yet occurred, but at Munich they had a case many years ago; so they say."

At Wentz, the surgeon, during a course of forty-five years, had only one alarm. It occurred from the body of an old man whose abdomen having subsided from the discharge of a large quantity of fluid, allowed the arms to fall lengthwise beside the body.

There are numerous and generally reliable tests for determining whether death has actually occurred previous to the commencement of decay, which are familiar to most people. Granted that in extremely rare cases, it is possible these should fail, it is difficult to perceive how the device of Mr. Vester is an improvement upon the German method. It consists of an ordinary burial case or coffin with a tube at the head, containing a ladder and a cord to enable the resuscitated individual to return to the upper air, provided he has strength to do it, which we think would in most cases be doubtful.

An experiment with this apparatus was made by the inventor on the 1st instant, at Newark, New Jersey, in the presence of a large number of people, and is thus described in the New York *Tribune*:

"At the hour named the inventor made his appearance and laid himself in the coffin, the lid of which was fastened by four screws, two on each side. This coffin was of the ordinary description, with the exception of a wire screen immediately at its head. The coffin was then ornamented with a cross and a quantity of leaves and white flowers, and the whole—man, coffin, cross, and flowers—lowered by straps into the grave. A large box, rather larger than the customary ones, with a hole two feet square at the head, directly over the coffin screen, was then lowered into the grave. Another box, about two feet in width and seven feet high, was placed in an upright position, one end fitting exactly into the square hole in the coffin box. The earth was thrown upon the box, around the upright, and all was ready for the test. In the upright box was a flight of stairs, by which the ascent to the "upper crust" was to be made. One curious individual looked down the upright, and, seeing the inventor wiping the perspiration from his brow, asked if it was "warm down there?" He narrowly escaped being put from the grounds by the excited Germans present. About an hour after the "burial," Mr. Vester pulled himself from his coffin by means of ropes attached to the lower portion of the upright, and ascending to the stairs, again appeared upon the earth. He was greeted with kisses and other manifestations of warm approval by a number of his ardent admirers. The exhibition passed off very successfully. Those who witnessed it are divided in opinion as to the utility of the invention. The inventor proposes to place a sort of alarm upon the upright, that the person interred can attract the attention of parties in case assistance is need, and also intends to place shelves in the upright, within reach of the party buried, on which stimulants may be placed. The invention is claimed to be of inestimable service where parties have been interred while in a trance, as well as to relieve persons of the sorrowful thought that perhaps their friends have been buried alive."

MANUFACTURING, MINING, AND RAILROAD ITEMS.

A FACT OF IMPORTANCE TO TOURISTS.—At this time, when many persons are about to make a European tour, it may be interesting to learn that so great are the facilities of communication between London and Switzerland, that a traveler leaving Charing Cross Station at 8:30 A.M., can arrive at Geneva on the following morning.

ILLINOIS AND ST. LOUIS BRIDGE.—The total cost of the great Illinois and St. Louis Bridge, including structure, land, and approaches, is set down at $4,500,000. The engineer-in-chief estimates that the work will be completed in 1870, or 1871, and that in the last named year the receipts of the bridge will be $1,136,260.

THE CANARSIE RAILROAD.—The Canarsie Railroad Company contemplate an extension of their track northwesterly to Greenpoint; thus having two water fronts, and furnishing facilities for travel from East New York to Greenpoint and the upper part of Manhattan Island.

THE MONCRIEFF GUN-CARRIAGE.—Experiments were conducted last month at Shoeburyness, for the purpose of testing the Moncrieff Gun Carriage, the construction and operation of which were fully described in a late number. The gun mounted was the ordinary 7-inch land service, fired first with 14 lb. powder and 115 lb. shot, and afterward with full battery charge of 22 lb. powder and 115 lb. shot. The result was very successful.

FRENCH RAILROADS.—According to official documents, there are at present in working order in France 9,666 miles of railroad, and it is proposed to have 14,699 miles completed before 1878. The cost of construction per mile is estimated at about $145,000 gold.

SLEEPING CARS FOR EUROPEAN RAILROADS.—An American firm has sent an agent to Europe to negotiate with various railroad companies for the introduction of sleeping cars upon their lines. The firm offers to build the carriages and hand them over to the companies on condition of being permitted so collect extra fares, for the accommodation thus furnished, from such travelers as may avail themselves thereof. The adventure will likely prove a success on the long continental lines.

OUR STREET DEPARTMENT.—The President of the Citizen's Association charges the Street Commissioner, in a lengthy letter, with expending $40,000 per annum for blank books and stationery and $50,000 for repairing roads and avenues contrary to section 38 of the city charter, which provides that no expenditure exceeding $250 shall be made except in pursuance of contracts. There would seem to be a necessity of mending ways in a metaphorical as well as in a literal sense.

Recent American and Foreign Patents.

Under this heading we shall publish weekly a list of some of the more important recent home and foreign patents.

COMBINED SHEARS AND BOLT AND RIVET CUTTER.—Thomas Smith, California, Mo.—The object of this invention is to furnish a neat and convenient tool for the use of persons who work in sheet metal, blacksmiths.

SELF-ACTING WAGON BRAKE.—Thomas Smith, California, Mo.—In this invention the friction blocks are adjustable in order to accommodate them to to different wheels, and are directly attached to and supported by the springs of the brake. The apparatus is also made adjustable to horses of different sizes.

CULTIVATOR.—D. McNeely and C. J. Cady, Spurgeon, Ind.—This invention has for its object to produce a cultivator which will be convenient and effective for plowing corn, cotton, tobacco, potatoes, and other vegetables, and which can be readily and easily adjusted for shallow or deep plowing, as circumstances may require.

CHURN.—J. W. Thompson, Bureau Junction, Ill.—This invention relates to that class of churns in which the dasher has four motions, viz: up, down, right, and left, and consists in effecting such motions by means of a new and greatly simplified device, which can be attached to any churn at a trifling expense, and which is convenient and easy of operation.

HAY FORK.—C. S. Ambruster, Woodstown, N. J.—The object of this invention to provide a neat, cheap, and convenient hay fork, by which the hay can be grasped securely, and firmly held, while being elevated, and can be instantly released when arriving at the place where it is desired to deposit it.

POTATO DIGGER AND SEPARATOR.—Wm. Green, Holly, Mich.—In this invention, a new and improved device is employed for separating the vines from the potatoes, whereby the work is more rapidly and effectually accomplished than in other machines, and in connection with this, a new apparatus is used for adjusting the working parts of the machine, and throwing them into or out of gear.

COMPOSITION FOR ROOFING.—Benjamin Stephens, Wheeling, W. Va.—This invention is an improved composition of matter for roofing which is of such a nature, that it will prevent the paper from cracking, and will form a fire proof and water-proof covering for the building.

SELF-FEEDING ROD MACHINE.—Frank Douglas, Norwich, Conn.—In this invention, the knives which reduce the stick to a round rod, are so arranged that one of them scores directly into the stick, and, at the same time, draws it along and feeds it to the cutter, while the others shave off the corners of the rod and round it to the proper size. A new guide plate is also employed together with a new device for holding the rods when they shall have passed through the guide plate.

FLOUR BOLT.—H. N. Shultz, Sabillasville, Md.—The object of this invention is to provide a simple and inexpensive device which can be used in connection with any form of flour bolt, and applied to the old ones now in use, and by which the bolt can be jarred or subjected to a series of sudden shocks during each revolution, so as thereby to be cleansed and kept free from the accumulation of flour. The device is so arranged that it can be readily adjusted to impart any required degree of violence to the shocks, or to allow the bolt to run smoothly, if desired.

BASE BALL TALLY BOARD.—Thos. L. Canary, Brownsburg, Ind.—This invention relates to the game of base ball, and consists in an arrangement of pins and in the use of colored balls thereon, and in a slate or other equivalent marking surface in combination therewith, whereby the game of the contending sides may be accurately kept, as well as that of each individual player.

MACHINERY FOR TURNING, CROSING, AND FINISHING BARRELS.—Saxton J. Arnold and Amos F. Clark, Raymondsville, N. Y.—This invention relates to improvements in machinery for turning, crosing, and finishing barrels, and consists of a device for holding the barrel in a convenient position for the performance of these operations.

SHUTTLES.—Edward Baggett, Fall River, Mass.—This invention consists in a secondary spring interposed between the spring commonly used, to take the wear off from the shoulder of the spindle, and in constructing the shoulder of the spindle in a form adapted to the application of the said secondary spring.

RAILROAD CHAIRS.—Samuel T. Alexander, Pittsburg, Pa.—This invention consists in a bed plate which is to be fastened to the tie, provided with grooves for seating clamping pieces which support the rail and with lugs for preventing the said clamping pieces from being thrown out of the grooves wherein they rest; and also in the said clamping pieces.

CHECK VALVE FOR PUMPS.—Wm. R. Malone, Mason, W. Va.—This invention consists in providing a hollow tapered seat having a downward projection for supporting the valve stem, which is provided with jam nuts to regulate the amount of lifting of the valve, which is seated upon the top of the valve seat, the latter is arranging to be fitted into a box or cylinder and secured in the well tube at any desired point.

STOVE DRUM.—G. S. Walker, Erie, Pa.—This invention consists of a hollow radiating cylinder or drum made of sheet metal and suitably arranged to be applied to a stove in any desired manner, and having pipe connections for securing and discharging the product of combustion, and provided with an internal apparatus for conveying the said product around and exposing it to the shell of the drum in a manner to extract the heat therefrom.

ADHESIVE PLASTERS.—John Lynch, Columbia, S. C.—This invention consists in attaching to the backs of such plasters one or more springs, stays, or flexible rods or bows, which not only prevent the plaster from crumpling or wrinkling, but serve as additional support to the muscles.

CARRIAGE COUPLING.—Alfred S. Johnson, Waupun, Wis.—This invention relates to an improvement in the method of coupling the thills of buggies or the poles of carriages to the

PUNCH FOR BELTS AND OTHER PURPOSES.—David M. Weston, Boston, Mass.—This invention consists of an improved construction of the jaws of a common hand punch, whereby the distance of the hole to be punched from the edge of the material may be readily gaged, and the material disengaged from the punch after the hole has been formed; also, an improved arrangement of the spring for opening the jaws.

HAND LOOM.—Edwin Lowe, Burrows, Ind.—This invention consists in connecting to the lay, pawls suitably arranged to give intermittent rotary motion to a tappet shaft, which in turn operates the treadles and picker staves.

GATE.—J. H. McKnight, Oakland, Mich.—This invention has for its object to furnish an improved gate, simple in construction, strong, and durable, and which may be conveniently operated to open or close it, without its being necessary to get out of the carriage for that purpose.

ORGAN PIPE.—Geo. H. Brock, Huntington, N. Y.—This invention relates to a new manner of constructing organ pipes, and consists in making each pipe of a curved plate, held between two disks. In this manner a more substantial, solid, effectual, and a cheaper pipe is obtained than could ever be produced according to the old plan now in use.

SEGAR PIPE.—Henry E. Doster, Bethlehem, Pa.—This invention relates to an improved method of smoking tobacco, whereby all the advantages of a fine segar may be enjoyed without incurring the expense, and whereby the objections to the vulgar pipe are obviated.

CHURN.—N. P. Chaney, Potsdam, N. Y.—This invention relates to improvements in churns, the object of which is to provide a churn having beaters provided with air passages to convey the air down into the cream while it is being agitated, and scrapers for scraping the cream off from the underside of the cover, all arranged in such a manner as to scrape it away from around the opening for the shaft, and thereby preventing it from oozing up through the cover around the shaft.

SLEIGH.—Lewis A. Spickler, Clear Spring, Ind.—This invention consists in the location of the point of attachment of the shafts with the sleigh behind the front or bent part of the runners and the metal plate, permitting this improved location of the same.

RAILROAD CAR SEAT.—F. F. Wagner, Harrisburg, Pa.—This invention consists chiefly in attaching projecting lugs to the axles, by which the swinging arms, holding the chair backs, are secured to the seat frame, said lugs being attached to that side of each axle which is opposite to that from which the arms project, so that if the arms are turned down, the lugs will project from above the axle, and will raise the seat on that side on which such arms are folded down.

DISTILLING APPARATUS.—Duby Green, New York city.—This invention relates to a new apparatus for distilling alcohol directly from the mash, and consists in a new construction of the boiling apparatus, which contains six chambers, one above the other, all communicating with each other, and all producing vapors from the mash contained in them; the lowest chambers, which have the weakest mash, receiving the greatest amount of heat, and the highest the least. The invention also consists in the arrangement of a new stirring device, which receives its heat from the vapors that arise from the boiling apparatus, while heretofore direct steam had to be used for that purpose.

VENTILATING SASH OPENER.—W. C. Stickney, and James McGee, Steubenville, Ohio.—This invention has for its especial object to furnish an improved device for opening and closing ventilating sash-doors, or transoms of railroad cars, which shall be simple in construction, easily operated, and which will hold the sash securely in any position to which it may be adjusted.

CIRCULAR SAW CARRIAGE.—John Orm, Paducah, Ky.—This invention has for its object to improve the construction of the carriages of circular sawmills, so as to make them more convenient and effective in operation.

LIFE AND SURF BOATS.—John R. Grace, Brooklyn, N. Y.—This invention has for its object to improve the construction of the improved and surf boat, patented by the same inventor, March 6th, 1860, and numbered 27,362, so as to make it more convenient and safer in use.

VELOCIPEDE.—Andrew Christian, New York city.—This invention has for its object the construction of a velocipede, in such manner that the axle will always be under complete control of the operator, the dead point being readily and completely overcome. The invention consists in so connecting the two operating levers with the connecting rod of the crank, that the dead point of one will readily be overcome by the movement of the other.

WATER WHEEL.—Joseph Hathaway, Woodstock, Vt.—This invention relates to a new and improved water wheel, of that class which is attached to a vertical shaft, and works within a cylindrical case, and has an internal discharge.

CORN PLANTER.—S. O. Campbell, Leavenworth, Kansas.—This invention relates to a new and improved corn planter, which also, when desired, may be readily converted into a cultivator. The invention consists in a novel construction and arrangement of parts whereby corn may be dropped with great accuracy, and properly deposited in the hills; the kernals or grains being left at the desired distance apart, and the device placed under the complete control of the operator or driver.

CHURN DASHER.—A. T. Bleyley, Conception, Mo.—This invention has for its object to furnish an improved churn dasher, which shall be so constructed and arranged as to bring the butter in a very short time, while at the same time it may be used for gathering the batter, and for removing it from the churn.

CHURN.—Joseph Watts, Brazil, Ind.—This invention has for its object to furnish an improved churn, which shall be simple in construction, easily operated, and effective in operation; bringing the butter quickly, developing