

THE Scientific American.

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY AT

NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

Messrs. Sampson Low, Son & Co., Booksellers, 47 Ludgate Hill, London, England, are the Agents to receive European subscriptions for advertisements for the SCIENTIFIC AMERICAN. Orders sent on them will be promptly attended to.

"The American News Company," Agents, 121 Nassau street, New York.

American and Mexican News Company, Mexico, are Agents for the SCIENTIFIC AMERICAN.

VOL. XV., No. 2, [NEW SERIES.] Twenty-first Year.

NEW YORK, SATURDAY, JULY 7, 1866.

Contents:

(Illustrated articles are marked with an asterisk.)

*Improved Steam Boiler.....	15	Law Applicable to Reissue	21
Locomotive Boilers.....	15	of Letters Patent.....	21
Why a Gun Becomes Hot on	16	New Publications.....	21
Firing.....	16	Special Notices.....	21
Foreign Scientific News.....	16	*Lubricating, Adjusting, and Lu-	22
An Extraordinary Railroad	16	bricating Mill Stones.....	22
Disaster.....	16	Water as Fuel.....	22
Ryerson's Church.....	16	*Olmsted's Patent Drill	22
The Spectroscope.....	17	Chuck.....	22
A Great Railway Enterprise.	18	Water-Proof Enamel for	23
Variable Star.....	18	Card Photographs.....	23
*McDonough's Caloric En-	18	Educated Mechanics.....	23
gine.....	19	Free-and-Easy Legislation	23
To Prevent Chafing.....	19	on Patents.....	23
*Christian's Device for Oil	19	A Four-Tool Planer.....	23
Wells.....	19	Just Measure.....	23
Glass Brick Mold.....	19	Patent Claims.....24, 25, 26, 27,	23
Our New Dress.....	19	Advertisements.....28, 29,	23
A Weak Steam Boiler.....	20	*Improved Gage Cock.....	30
Circular Saws.....	20	*Improved Journal Box.....	33
Notes and Queries.....	20	The "Galaxy".....	30
New Inventions.....	21	University Law School.....	30

EDUCATED MECHANICS.

In a recent number we spoke of the advantages of intellectual education for mechanics and workmen, in addition to that derived from the shop, the farm, or the road. We alluded to it as a means to raise the position of the workman and to elevate the status of his profession.

In the ordinary prosecution of his business, the artisan must be stolid indeed if he did not gain some knowledge beyond that of mere manual dexterity. His judgment and his capacity for comparison is stimulated by hints, incidents, and accidents, so that he must improve more or less. But an acquaintance with the laws which govern matter in all its forms, whether at rest or in motion, the means of availing himself of the operation of those laws, come slowly to him unless he understands the principles upon which those laws are founded. Such knowledge is not readily gained in the prosecution of his business, but by study. Knowing the existence of the phenomena, of which he is a daily witness, he must spend years in using that knowledge by piecemeal as he receives it, and work over again the experiments, the processes and results of which have been recorded for him, unless by reading and study he is willing to avail himself of the labors of those who have gone before him.

Therefore we cannot too strongly insist on the study of the natural sciences by all who aspire to use the latent or active forces of nature for the benefit of themselves or of mankind in general. An instance of the benefit to be derived by mechanics by a judicious course of study, we cannot forbear to introduce here, an instance of the recognition of merit—in the hope that others may be induced to follow so shining an example. We have mentioned the fact that at the annual commencement of the University of the City of New York, held June 21st, at Niblo's Garden, the degree of Doctor of Physical Science (*Doctor Physicis Artibus, A. P. D.*), was conferred upon Erastus W. Smith, an eminent mechanical engineer. It was the first honorary degree of this character conferred in this country.

We have obtained some facts in regard to the recipient of this honor which may not prove uninteresting. Mr. Smith served an apprenticeship at the Allaire Works, in this city, remaining there four years, when he entered the University and pursued a course of study in the physical sciences, graduating with the class of 1844. He returned to the Allaire Works and spent several years as workman, foreman, and superintendent. He has since filled important positions as engineer of the American U. S. Mail

Steamships, comprising the Bremen, the Southampton, the Havre, and the Collins's Liverpool lines.

He designed and superintended the construction of the engines for the New Orleans Water Works, and of the engines of several inland lines of steamers, including the *Metropolis*, of the Newport route, and is now designing and constructing engineer of the Harlem Bridge, the engines of the New York and Bristol line of steamers—the cylinders of which measure 110 inches with twelve feet stroke,—of several other steam-transportation companies, and of the *Duenderberg*, under the Government contractor, Wm. H. Webb.

Application to and love for his business, with a determination to fit himself for the highest positions in his profession, we believe, have been of more service to Mr. Smith than the patronage of influential men or capitalists. In his letter conveying the information of the honorary testimonial, Prof. Draper said:—

"I am sure it will be gratifying to you to learn that yours is the first degree of the kind ever conferred in this country, and is the highest we can give. It is for these reasons all the more honorable to you. The establishment of this degree places the University in connection with mechanical engineering—one of the most important and growing professional interests of our city and country."

Our object in thus noticing this acknowledgment of merit is not to add to the well-earned reputation of the recipient of these honors, but to present it as an incentive to our mechanics. When literary societies and educational institutions accord to the educated mechanic and the scientific engineer the position to which his usefulness and worth entitles him, the status of the mechanic is raised and his profession becomes, in the eyes of the world, more honorable. Practical knowledge, combined with natural genius, aided by mental acquirements, is sufficient to enable any intelligent mechanic to reach the uppermost round in the ladder of his profession.

FREE AND EASY LEGISLATION ON PATENTS.

On the 25th ult., Senator Cowan, chairman of the Patent Committee, reported a bill for the extension of Thos. D. Burrall's patent for a corn sheller; he also reported a bill for the extension of Thos. W. Harvey's patent for the manufacture of wood screws; also for the extension of Stephen R. Parkhurst's patent for ginning cotton and burring wool. It remains to be seen what action the Senate will finally take in regard to those important measures.

Mr. Cowan reported the House bill, which provides for the payment of a ten-dollar tax on all cases taken from the primary Examiner, on appeal, to the Examiner-in-Chief. After the Senator had stated the nature of the bill, the following debate took place:—

Mr. Cowan.—I will merely state that an application for a patent is first referred to the primary Examiner, and if the decision is adverse there is an appeal to the Board of Examiners, but on that appeal there is no fee now paid. It is complained in the Office that parties do not appear before the primary Examiners, because they can appeal without any additional cost; and it is therefore thought to be advisable, for the purpose of compelling them to attend to the case before the primary Examiners, that there should be an appeal fee, to be paid before going to the Examiners-in-Chief. The committee think this is proper, and have therefore recommended the passage of the bill.

Mr. Grimes.—Is that all there is in the bill?
Mr. Cowan.—That is all.
The bill was reported to the Senate, ordered to a third reading, read the third time, and passed.

Thus a bill which will draw from the pockets of inventors between \$4,000 and \$5,000, annually, passed without a show of opposition. Mr. Cowan's, "That is all," satisfied the Senate, and the thing was done.

We regret the success of this unjust measure. The Patent Office has nearly \$150,000 surplus funds, and does not need to tax inventors any more for the privileges they now enjoy.

A FOUR-TOOL PLANER.

Some few weeks ago we gave a description of a seven-tool lathe for working out railway cranks with accuracy and dispatch, which was in use at the locomotive works of Crewe, England. We find, in a recent number of the *Engineer*, an engraving and brief description of a planer designed to economize time, it being well known to practical men that half the

time of an ordinary tool of this class is wasted; or, in other words, that during the return of the bed the tool is idle.

Planers that act both ways are not new, by any means, Whitworth having, long ago, introduced a machine of this class with a rotating tool post that faces about after the bed has made one stroke, and cuts on the return. What degree of popularity this device meets with in England, we are unable to say, but few machines have been imported to this country. On long lathe beds, steam engine bed plates, and similar work, such an arrangement would seem to be very desirable, but there must be some practical difficulties in the way which prevent their adoption.

We have been informed that it is a matter of difficulty to adjust the tool so that the cut is equal in running both ways, and that the least hesitation or inaccuracy in the reverse action of the tool causes it to take a heavier cut at one time than at another, and so, break the tool or spoil the work.

In Elder's machine there are two sets of standards or uprights in the middle of the bed, which face each other, and are fitted with sliding carriages and headstocks, as usual, there being two headstocks on each slide. These are so arranged that but one or all may be in use at the same time; that is, two cutting when the bed runs one way and two when it returns.

This duplication of parts, of course, entails great expense in construction and adds to the weight of the machine, besides rendering it much more complicated; but there is no question about its efficiency, which is the main point to consider.

A JUST MEASURE.

In a previous number we stated that the bill to pay Examiners in the Patent Office, for extra service rendered by them, had passed Congress. A dispatch to the Associated Press made it appear that the money thus appropriated was to come from the Treasury, which is not the case. The facts are simply these: Soon after the breaking out of the rebellion the number of applications for patents was greatly reduced, which caused also a considerable reduction in the patent fund, and in order to comply with the law making the Patent Office a self-sustaining bureau, the Commissioner was obliged to reduce the salaries of Examiners and Assistant Examiners below the amounts fixed by law, which was the best course he could adopt as a temporary expedient, as it could not be regarded wise to remove experienced Examiners in such a contingency, which was not likely to last for a long time. During the years from 1852 to 1860, the average number of cases examined per man was one hundred and forty-two; from 1860 to 1865 the average was two hundred and forty—an increase of eighty-two per cent. This increased amount of labor was done on reduced salaries and at a time when the cost of living was double what it was before the war broke out. The Examiners, as a body, are a faithful, laborious, intelligent set of men, and, at best, are not overpaid for their services, and now that the patent fund has so largely augmented, there is great justice in the act of Congress which authorizes the Commissioner to pay Examiners and Assistants out of the patent fund for services actually performed by them.

Mr. Wentworth, of Illinois, attempted to defeat the bill, but his effort did not produce any effect. Mr. Jenckes, the mover of the bill, and to whom much credit is due, met all the objections, and the bill passed by a large majority.

THE 9-22-inch bore or 12½-ton Armstrong gun burst to splinters a few days since at Shoeburyness during ordinary gun practice, and after 390 rounds had been fired. The gun's crew had a very narrow escape for their lives, and Capt. Reeves, who was conducting the practice, was nearly struck by a large piece of the gun as it flew past him.—*Mechanics' Magazine.*

ALUMINUM ARMOR.—A trial has just been made at Florence of a cuirass of aluminium, which is as light as an ordinary waistcoat, nearly as flexible, and capable of turning a musket ball fired at the distance of 38 paces, and of resisting a bayonet thrust from the heaviest hand. Each cuirass costs only 5 frs. Two regiments are, it is said, to be immediately provided with them.



ISSUED FROM THE U. S. PATENT OFFICE

FOR THE WEEK ENDING JUNE 24, 1866.

Reported Officially for the Scientific American.

Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

55,799.—MODE OF CUTTING BOOTS.—John Adams, Kokomo, Ind.:

I claim a new article of manufacture, a boot produced as follows, to wit, by cutting the foot and toe portion out of a single piece of leather, the counter or heel piece being left out, and then constructing the uppers of the boot from said foot and leg portion and a separate counter-piece, by having a seam extend down the back to the tops of the counter, then running the seam to the front edges of the counter and from thence down to the Shank of the foot, said horizontal and vertical side seams serving to fasten the separate outside counter-piece of leather over the opening which was left in cutting the foot and leg of the boot, all substantially as and for the purpose described.

55,800.—GRAIN SEPARATOR AND CLEANER.—William M. Arnall, Sperryville, Va., assignor to himself and W. H. Brownell, New York City:

I claim, 1st, The arrangement of the cylinder, B, the rollers, F, F, F, in the arc of a circle described by a radius from cylinder, E, together with the adjustable brushes, a, a, a, and dividing board, P, substantially as and for the purpose herein set forth.

2d, The throat, G, with its gauge-board, f, rollers, F, cylinder, E, and fan, D, arranged and used as and for the purpose specified.

55,801.—DEVICE TO PREVENT BOILER EXPLOSIONS.—Alfred Arnold, Tenaply, N. J.:

I claim, 1st, The mode of preventing steam boiler explosions, substantially as herein set forth.

2d, The construction and arrangement of the devices necessary to carry the mode into operation, substantially as described.

55,802.—EGG-BEATER.—Frederick Ashley, New York City:

I claim the grooved or screw threaded slide or sleeve, E, in combination with the plain shaft, A, having a fixed stud or pin, a, and a beater, B, arranged together and operating as and for the purpose specified.

55,803.—WATER WHEEL.—Samuel W. Ayres, Monticello, Ind.:

In combination with the spiral scroll, A, I claim the double wheel, B, C, from so arranged that the water shall be discharged from the scroll through the upper section, towards the center, and thence passing into the lower section be discharged from the center through the periphery, substantially in the manner set forth.

55,804.—HORSE RAKE.—H. A. Bailey and A. R. Burdick, Racine, Wis.:

We claim, 1st, The metal heads, J, provided with lips, g, and grooves, i, and retained on the rake-head by the upper ends of the rake teeth, K, passing through them and the rake-head, substantially as and for the purpose herein set forth.

2d, The attaching of the rake-head, H, to clutches, D, D, fitted loosely on the axle, A, and operated by means of levers by the driver from his seat, G, for the purpose of automatically raising the rake to discharge its load, substantially as shown and described.

55,805.—ROOF OF BUILDINGS.—William W. Beach, New York City:

I claim, 1st, The use of mica or mineral isinglass in sheets or plates as a roofing material, transparent, translucent, opaque, and ornamental, substantially in the manner and for the purpose herein set forth.

2d, Ornamenting upon or between the plates or thicknesses of the mica, substantially as set forth and described.

3d, Making an elastic roofing by cementing the plates of mica with flexible cement, substantially as set forth herein.

4th, The combination of mica with wood, slate, or other equivalent substances, substantially in the manner and for the purposes herein set forth.

55,806.—LAMP.—Jacob H. Beidler, Lincoln, Ill.:

I claim, 1st, The method herein described of creating an ascending current of air to feed the flame, by means of steam generated by the calorific emanating from the illuminating flame of the lamp.

2d, The combination of the boiler or heater, D, the steam pipes, D', D', the annular chamber, C, and the feed-tube, B, with the oil cup, A, perforated plate, g, and deflector, f, as and for the purpose described.

3d, The hot water-rank, C', in combination with the feed-tube, B, and the boiler or heater, D, as and for the purposes described.

55,807.—GRATER AND EGG-BEATER.—William A. Bemis, Spencer, Mass.:

I claim, 1st, The combination with the lower half, B, of the body of the beater, of the removable frame, D, provided with the cutting wires, a, substantially as and for the purposes set forth.

2d, In combination with the egg-beater, I claim the grater moving in guides on the body of the egg-beater, the whole being constructed and arranged substantially as and for the purpose shown and described.

55,808.—MACHINE FOR FRAMING MATCHES.—Jacob Bentz, Brooklyn, N. Y.:

I claim, 1st, In combination with the grooved bed and hopper, the loose hopper-box or frame, constructed and operating substantially as described.

2d, The construction of the grooved bed in two parts; the front part being hinged to the rear fixed part for the purpose of being swung down below the plane of the fixed part when required to remove broken splints, slivers, or other obstructions, substantially as described.

3d, In combination with the grooved bed, I claim the guides or stops in front of the grooved bed, substantially as described.

4th, In combination with the plunger frame and the front sliding frame which supports the splint frame, I claim the rock-shaft and system of levers and levers, whereby the down-throw motion of the sliding frame is communicated thereto by the back motion of the plunger frame.

55,809.—STUMP EXTRACTOR.—John W. Blodgett, Plymouth, Ind.:

I claim, 1st, The combination and arrangement of the posts, C, and foot-boards, E and N, substantially as and for the purposes set forth.

2d, Wheels, M and P, frame, L, windlass, W, chain, L, and lever, K, in combination with wheels, A, foot-boards, C, E, N, substantially as and for the purposes set forth.

55,810.—UTILIZING STEAM.—John M. Brosius, Liberty, Va.:

I claim the arrangement, with a stationary depot or water station casing, of the locomotive boiler, substantially in the manner and for the purpose described.

55,811.—COTTON-SEED PLANTER.—Frederick H. Brown, Chicago, Ill.:

I claim, 1st, In a cotton-seed planter the combination of the shaft, K, provided with arms, V, and the conveying belt, L, provided with teeth as described, arranged, and operating substantially in the manner and for the purposes herein specified.

2d, In combination with the said conveying belt, L, I claim the shaft, U, provided with suitable wings or cleaners, arranged and operating substantially as specified and shown and for the purposes set forth.

3d, The combination of the shaft, R, provided with arrows or spikes, the toothed belt, L, and the winged shaft, U, arranged and operating as and for the purposes described.

55,812.—MODE OF CONSTRUCTING VACUUM VESSELS FOR EVAPORATING, ETC.—Duncan Bruce, Rossville, N. Y.:

I claim the method, substantially as herein described, of strengthening and rendering wooden vessels air-tight, for the purposes set forth.

55,813.—HAMMER FOR BENDING COUPLINGS.—John T. Bruen, New York City:

I claim, 1st, The anvil, the hammer, the connecting-rod, and the treadle, when constructed and arranged substantially as and for the purpose herein specified.

2d, The apparatus for throwing out the material after the successive operations of the hammer, applied, arranged, and operating substantially as herein specified.

3d, The annular spring or buffer, d', applied at the lower end of the connecting-rod, substantially as described, and serving the two purposes of regulating the stroke of the hammer and of preventing destructive concussion and noise.

55,814.—LOCK.—Henry and Samuel W. Budd, Philadelphia, Pa.:

I claim, 1st, The bolt, B, and its spring, d, in combination with the sliding block, F, and plate, b, or its equivalent, the whole being constructed and operating substantially as and for the purpose described.

2d, A series of tumblers in combination with the block, F, and with projections in the casing, D, the whole being constructed and operating substantially as and for the purpose specified.

55,815.—BRUSH FOR BOILER FLUES.—Charles H. Bush, Fall River, Mass.:

I claim an expanding and contracting brush for clearing obstructions from the flues of steam boilers, constructed and operating as herein set forth and described.

55,816.—RAILROAD WATER-ELEVATOR.—William H. Butler, Chicago, Ill.:

I claim, 1st, A metal tank lined with wood which has been previously saturated with oil or other resistant to rapid condensation of steam, or coated with such resistant on one or both sides, substantially as described and for the purpose mentioned.

2d, I claim in combination with the follower and steam pipe the rubber packing, I, as described.

55,817.—STEP-LADDER.—E. P. H. Capron, Springfield, Ohio:

I claim, 1st, The ladders, A and B, platform, C, and the notched bar, E, all combined and arranged to operate as shown and described.

2d, The slotted bar, D, provided with the series of holes and pin, i, arranged to operate in combination with the ladders, A and B, and platform, C, as herein set forth.

55,818.—TREATING ORES.—Charles F. Carpenter, Louisville, Ky.:

I claim the mode of using steam of any temperature for the purpose of facilitating the process for extracting gold and silver from ores, and consists in introducing said steam into a reverberatory furnace between the flame of said furnace and the ores containing gold or silver which are spread upon the hearth of said furnace, as herein described, or any other substantially the same.

55,819.—WATER-INDICATOR FOR STEAM GENERATORS.—Franklin Chalfant, Lancaster, Pa.:

I claim, 1st, The vibrating column or cylinder, F, in connection with a steam boiler, A, when employed for the purpose specified.

2d, I also claim the soapstone disks, K, when applied substantially in the manner and for the purpose set forth.

55,820.—ICE-CREAM FREEZER.—John R. Champlin, Laconia, N. H.:

I claim, 1st, The side-scrapers, G, when made in the form and adjusted in the manner described, in combination with the horizontal arms, E, of the beater, substantially as and for the purposes set forth.

2d, The frame, K, and support, X, when constructed substantially as described, in combination with each other and with the shafts, F and L, as and for the purpose set forth.

3d, The use of a combined joint and swivel for coupling the beater to the beater and cream-holder of an ice-cream freezer, substantially as described.

4th, The coupling device herein described, in which the coupling is accomplished by dropping the clutch upon the shaft and cream-holder, substantially as described and for the purpose set forth.

55,821.—PUMP.—Robert Cochran, Morrison, Ill.:

I claim the combination and arrangement of the valve, I, pipes, O and P, and cylinders, A and B, substantially as herein described and set forth.

55,822.—PUMP FOR DEEP WELLS.—Robert Cornelius, Philadelphia, Pa.:

I claim the combination of an outer case with apertures, an interior wire gauze or perforated screen, and a receptacle below for the debris, substantially as described.

55,823.—DOOR-BELL AND BURLAR-ALARM.—Elliot H. Crane, Burr Oak, Mich.:

I claim, 1st, So arranging two hammers to a bell that, while the bell answers the purpose of an ordinary door-bell, its parts can be adjusted to act as a burglar-alarm when the door is opened, substantially as described.

2d, The combination of the two hammers, L and O, bell, D, notched base-plate, c, swiveling pawl or arm, T, and knob handle with a plate or tripper, H, upon its spindle, when the several parts are arranged together and so as to operate substantially in the manner and for the purposes described.

55,824.—HORSE HAY-FORK.—Thomas C. Craven, Albany, N. Y.:

I claim, 1st, Applying a hook or barb, h, to the hollow point of a harpoon hay-fork, so that this hook shall work loosely within said point, and project therefrom by the depression of a rod, C, substantially as described.

2d, Connecting the upper portion of the curved rod, C, to the upper portion of its hollow stem, A, by means of toggle-joints,

which are adapted to serve as a locking device, substantially as described.

3d, The combination of the tripping lever or eccentric, f, or its equivalent, with locking toggle-levers and rod, C, for the purpose of unlocking said rods.

4th, Curving the upper portion of the rod, C, for the purpose substantially as described.

55,825.—CHURN.—F. J. Crissey, Leesburg, Va.:

I claim the arrangement and combination of the center dasher with fly-wheel at top and propelling cord on the shaft, so that the shaft is operated swiftly with a forward and reverse action, as herein described and for the purposes set forth.

55,826.—CULTIVATOR.—John Custer, Sandusky, Ohio:

I claim, 1st, The hinged cleaners, H, in combination with the levers, I, arranged to operate with the cutting rollers, D, in the manner and for the purpose herein specified.

2d, The combination of the cutting rollers, D, hinged cleaners, H, frame, A, bar, K, and chain, J, arranged and operating as described.

55,827.—MARINE COMPASS.—Samuel Custer, Salem, Va.:

I claim, 1st, The combination of the lower battery magnet with the upper indicator magnet, substantially as and for the purpose described.

2d, The construction of the cruciform indicator-magnet with a pointer placed midway between the north and south poles of its two needles.

3d, The arrangement of the indicator-magnet upon and eccentric with the main compass-card or its frame, for securing a longer radius to the pointer.

55,828.—ROLLER-FEED FOR CARDING AND PICKING MACHINES.—James Dempster, Nantucket, Conn.:

I claim as an improvement in roller-feed for cards and pickers the combination and arrangement of the rolls, B, C, D, E, F, G, and the gear-wheels, I, L, M, N, S, R, and the gear-wheels, J, K, O, P, T, U, with each other and with the frame, A, of the machine, substantially as described and for the purposes set forth.

55,829.—HAY-RACK FOR WAGONS.—Daniel Dennett, Buxton, Me.:

I claim the stretchers, b, b, b, cut in two at d, d, in the manner and for the purposes specified.

55,830.—CAR FOR TRANSPORTING PETROLEUM.—J. Densmore, Meadville, Pa., and G. W. N. Yost, Corry, Pa.:

We claim the combination of the two-tank car with the one-tank car, being the three tanks, B, B, B, attached to and combined with the car-platform, A, A, A, by means of the frames, C, C, C, C', C', and the bolts, D, D, D, D, D, D, D, D, D, D, D, D, D, D, D, D, D, D, when constructed in the combination herein-before described, and for the application to the purposes herein-before written, or when done by any other mechanical construction substantially the same and which will produce the same results.

55,831.—CAR FOR TRANSPORTING PETROLEUM.—J. Densmore, Meadville, Pa., and G. W. N. Yost, Corry, Pa.:

We claim the one tank, B, attached to and combined with the platform of a car, A, by means of the frame of cars, C, C, C, C, and the bolts, D, D, D, D, D, D, D, D, D, D, D, D, D, D, D, D, D, D, when constructed and combined for the purposes herein-before described and set forth, or when attached and combined by any other mechanical construction substantially the same and which will produce the same results.

55,832.—CAR FOR TRANSPORTING PETROLEUM.—James Densmore, Meadville, Pa., and Amos Densmore and G. W. N. Yost, Corry, Pa.:

We claim, 1st, The one tank, B, square or oblong square of wood planks, bolted together and attached to an ordinary railway car, A, by means of the cleats, E, and the bolts, D, D, D, D, when the same are constructed and combined as herein-before described and for the purposes set forth.

2d, The two tanks, B, B, square or oblong square, directly over the trucks or axles, together in the middle of the car, of wood planks bolted together and attached to the car, A, by means of the cleats, E, E, and the bolts, D, D, D, D, when the same are constructed and combined as herein-before described and for the purposes set forth.

3d, The three tanks, B, B, B, square or oblong square, of wood planks bolted together and attached to the car, A, by means of the cleats, E, E, E, E, and the bolts, D, D, D, D, when the same are constructed and combined as herein-before described and for the purposes set forth.

4th, The square or oblong square tank or tanks of wood planks, attached to an ordinary car, when constructed and combined by any other mechanical contrivance, substantially the same, and which will produce the same results.

55,833.—MACHINE FOR PLANING MOLDINGS.—Thomas Dickinson, Newark, N. J.:

I claim the arrangement described and represented for dressing two moldings simultaneously by one center-head, consisting of the adjustable box-table, W, X, constructed and operated substantially as described.

55,834.—APPARATUS FOR MAKING PAPER-PULP, FOR BLEACHING AND FOR OTHER PURPOSES.—John W. Dixon, Philadelphia, Pa.:

I claim, 1st, The combination of the digester, A, the man-hole, B, the diaphragm, C, and the discharge-pipe and aperture, N.

2d, The combination of the digester, A, the heating coil, and the pump, D, as described.

55,835.—APPARATUS FOR MAKING PAPER-PULP FROM WOOD, STRAW, AND OTHER MATERIALS.—John W. Dixon, Philadelphia, Pa.:

I claim the combination of the circulating pump, the pulp digester and heating coil, or its equivalent, for heating the liquid while being made to circulate by the pump.

55,836.—PROCESS OF MAKING PAPER-PULP FROM WOOD, STRAW, AND OTHER MATERIALS.—John W. Dixon, Philadelphia, Pa.:

I claim, 1st, The pulping of wood, straw, and other vegetable substances with a solution of highly-heated aluminate of soda under pressure, substantially as described.

2d, I claim the pulping of wood, straw, and other vegetable substances by circulating a highly-heated solution of aluminate of soda through the mass to be pulped, substantially as described.

55,837.—HARVESTER.—John A. Dodge, Auburn, N. Y.:

I claim, 1st, The combination of the cam, B', bed-piece, B, and frame, A, resting upon the platform, the said several parts being respectively constructed and arranged for use, substantially in the manner and for the purpose set forth.

2d, The plate, E, and ratchet, E', upon the outside of the driving-wheel and pulley, D, upon the projecting extension of the axle, in combination with the belt, M, pulley, C, and bevel gear, for actuating the rake with the forward motion of the machine, substantially as set forth.

3d, The device for supporting the arm, H, by means of the bracket, L', attached to the socket, I, secured to the frame, substantially as set forth.

4th, The arrangement as herein set forth for supporting adjustably the inner end of the cutter-bar and platform by means of the arm, G, attached to the platform and connecting chain and projecting arm, H, secured to the main frame by the bracket, I', and socket, I.