



[Reported officially for the Scientific American.]

LIST OF PATENT CLAIMS Issued from the United States Patent Office FOR THE WEEK ENDING APRIL 28, 1857.

RAW HIDE WHIPS—Charles Baeder, of Brooklyn, N. Y.: I claim constructing raw hide whips without a core of filler, and giving the wrappers a slight twist, as shown and described. [Raw hide whips made according to this invention have the strips of which they are made cut angularly, and the butts twisted at an angle of 45 deg. The improvement enables the inventor to manufacture such articles from short hides, hitherto considered unfit for this purpose. This method effects a great saving in the cost of material, while at the same time a superior article of manufacture is produced—very important considerations.] HARVESTING MACHINES—J. F. Barrett, of North Granville, N. Y.: I claim constructing the combination of the straight forward and back moving knife, N, or its equivalent, with the oscillating or swiveling knives, R, R', when constructed and operating substantially as described. BINDING GRAIN—J. F. Barrett, of North Granville, N. Y.: I claim, in devices for facilitating the binding of grain, twisting or tightening the band after it has been crossed upon the sheaf by the operator, by means of jaws m, working in balanced shaft, c, in combination with the devices described for simultaneously closing and rotating said jaws, substantially in the manner set forth. FIREARMS—G. A. Blitkovski, of New York City: I claim, first, the rotating and oscillating breech-piece for receiving the charge so attached to the stock as to be capable of being withdrawn from the end of the barrel, and elevated to receive the charge, and to be returned thereto with a grinding and wedging action, whereby a secure and tight joint is effected, substantially as described. Second, I claim the safety guard, c, upon the end of the breech-piece, so placed as to prevent the cock from striking the nipple until the said breech-piece is secured in the barrel, as described. CONSTRUCTIVE LOCKETS, &c.—C. G. Bloomer, of Wickford, R. I.: I claim, first, the making of locket rims out of single pieces of metal instead of two or more, which are everywhere used. Second, I claim the making of them out of sheet metal instead of wire. Third, I claim the making of them substantially in the manner described. SIDEWALK PAVEMENT—J. B. Cornell, of New York City: I claim casting in one piece section of a street gutter, and curbs of suitable shape and proportions, substantially as set forth. I also claim forming the sidewalk pavement of a series of metallic plates, a, when said plates are combined with each other, and with the above-said metallic street gutter and curb, substantially as set forth. LOOKS—Leger Diss, of Iliou, N. Y.: I claim the combination of the stop holder, G, self spreading stops, e, and the spring N, with the tumblers moving the stop holder and needle block, the arrangement and operation being as described. Second, I claim the needle block, H, as attached to the stop holder, with its series of needles or pins, operating on the stops as described. Third, I claim the key block, F, constructed as described, and also the needle key, as shown in figures 3 and 4, fitted to its position, and operating as described. BUILDING AND ORNAMENTS—Steel and Other Metals—A. H. Dufresne, of Paris, France. Patented in France, May 14, 1856; I do not confine myself to the precise working details laid down, as the same may be modified according to the requirements of each operation, without departing from the principle of the invention. But I claim, first, the application of gold and silver to metals incapable of direct amalgamation by means of the processes described. Second, The employment of photographic, heliographic and printing processes for the production of the reserves on the metallic surfaces to be operated on by the means described. Third, The use of chromic acid for the destruction of the nickel, copper, antimony, or other metal employed in these processes as described. MORTISING STILES FOR BLIND SLATS—E. T. Drake, of Leominster, Mass.: I claim the described machine for cutting mortises for window blind slats, constructed in the manner substantially as set forth, and consisting essentially in the carriages E and G, in combination with the cutters, N, and bits n, operating in the manner specified. PORTS IN STEAM CYLINDERS—Bowen Eaton, of Roanoke, Ind.: I claim the arrangement of the central exhaust and steam ports as set forth for the admission of steam at each end of the cylinder only, and its exclusion from the central port only, the latter being controlled entirely by the piston of the engine cylinder. FIREARMS—Josiah Ellis, of Pittsburg, Pa.: I claim the arrangement of the traverse lever to permit of its playing on the same center as the hammer, without danger of lateral derangement. Second, The use of the cam in the lock plate, in combination with the shoulder on the traverse lever for the purpose of withdrawing the point of the traverse lever from the radial groove in the rotating breech in the reaction of the trigger for the purposes before set forth. Third, I do not claim the radial grooves in the end of the rotating breech, as new in themselves, but I do claim the combination of radial beveled grooves in the rear end of the rotating breech with the traverse lever, as applied to trigger cocking firearms for the purpose of rotating and locking the breech preparatory to firing, substantially as described. SEED DRILLS—Ezra Emmert, of Franklin Grove, Ill.: I do not claim broadly the use of edge wheels in seeding machines, neither do I claim broadly the use of extension tubes. But I claim the arrangement and combination of the wheels, E, with the extension pieces, d, in the manner and for the purposes substantially as described. [A series of wheels, similar to circular edge cutters, are arranged on the axle of the machine in front of the drill teeth, and connected with curved extension tubes. The wheels cut up all obstructions, and ordinary propelling wheels are not required; they also prevent the teeth of the drill from being clogged, which often occurs by coming in contact with sods and stones, and they render the operation of planting, either in drills or check rows, more perfect.] ACTION FOR GRAND PIANOS—D. F. Haasz, of Philadelphia, Pa.: I do not claim that portion of the described parts which bears directly on the immediate action of the check, J, on the hammer, as that portion is similar to the French action, known as Erard's. But I claim, first, attaching the supporter, L, to the key and the lever, M, and spring S, to the supporter, in the manner and for the purpose set forth. Second, The arrester, P, with the lever, Q, as connected to the key in combination with the adjustable wire, R, as attached to the key frame, the whole being arranged and constructed substantially as set forth and for the purpose specified.

CHRONOMETRIC LOCKS—Amos Holbrook, of Milford, Mass., and H. D. Fish, of Hardwick, Mass.: We do not claim the employment of two or more locks to operate chronometric locks. But we claim the confining of the frame bolt, G, and the releasing of the same by means of the jointed portion, G, i, the embracing pawls, H, H, and release levers, E, E, operated by said clocks, as set forth. We also claim the partial setting back of the independent locking spring bolts, I, I, by means of the spring catch, Q, until the closing of the door, as set forth. SEED PLANTERS—George M. Evans, of Pittsburg, Pa.: I claim so uniting the wheel and guard frame to the beam and to the rods or bars, K, as to the operator may from the depth at which the shoe shall open the furrow, adjust the depth at which the shoe shall open the furrow, by moving said wheel and guard frame forward or back, substantially in the manner and for the purpose explained. ENGRAVING WATCH CASES, &c.—C. H. Field, of Providence, R. I.: I do not claim two roses or irregular discs acting upon two studs for the purpose of determining the length of the line, nor do I claim an eccentric adjusted by the foot of the operator for this purpose. But I do claim the variable pattern disc, and combination of the same with the stud J, for governing the cutting of the tool. I also claim the combination and arrangement of the tappets, f, f', f', and the stud, v, also the tappet, b, in connection with the same, for imparting and regulating the motion of the pattern disc. I also claim the arm, E, and the lever, K, and the mechanisms attached thereto, the whole being so combined and arranged as to render the machine self-operating. Lastly, I claim the adjustable pitman, as set forth, for imparting the required motion to the vertical sliding plate, B. INVESTIGATIONS—Kingston Goddard, of Philadelphia, Pa.: I claim the application of the bent tube, C, to a common ink bottle, the whole arranged as described, whereby said common ink bottle is converted into an effective and economical fountain inkstand. BLANK BOOK INDEX CUTTER—George Hodgkinson and T. F. Randolph, of Cincinnati, O.: We do not claim any of the devices separately. But we claim the arrangement of the machine described for the purpose set forth. HARVESTER FRAMES—M. G. Hubbard, of Penn Yan, N. Y.: I claim joining the parts of the frame, substantially as described, by means of the lock plates or irons and bolts, so as to make a firm and rigid union between the parts at a small cost, as set forth. PHOTOGRAPHIC PICTURES, ENGRAVINGS, &c.—S. D. Humphrey, of New York City: I do not claim two photographic pictures, and a reflecting back ground, the rear photographic picture being colored, as the same was patented by J. Bishop Hall, January 20, 1857. But I claim an improvement on the said patent of J. B. Hall the use of a semi-transparent media interposed between two transparent photographic pictures or engravings for the purpose of blending the rays of light reflected from the rear colored photograph and beautifying the picture, substantially as specified. SAW GUMMER—Oliver B. Judd, of Little Falls, N. Y.: I do not claim dressingsaw teeth on a circle, as this has been done imperfectly by means of complicated machinery. I claim the method of constructing and arranging the posts, G, G, so as to cause the cutter to move in regular curves as described. ATMOSPHERIC PUMPS—Levi Keller, of Catawissa, Pa.: I am aware that the elevation of water by condensation of air is not new, and do not claim anything more than the combination of the water receiver, A, and air induction pipe with the valve n, acting with respect to the openings, o and r, as set forth, when said parts are arranged with respect to air condenser and discharge pipe, substantially as described. BRUSHES OF SAW COTTON GINS—Edwin Keith, of Bridgewater, Mass.: I claim inclining the heads of the brush cylinder from the periphery towards the center and opening the passages, a, through the heads in the manner substantially as set forth. SUBMERGED PROPELLING WHEELS—Thomas Kendall, Jr., of San Francisco, Cal.: I claim the means described for feathering or changing the positions of the wings, consisting of the cam plates, P, concentric ring, a, and curved levers, B, Z, which slopes or planes, the whole being arranged and operating substantially in the manner described. HARVESTERS—Isaiah Knauer, of Valley Forge, Penn.: I make no claim to the manner of producing the reciprocation, as that is not new. But I claim the peculiarly constructed close box, B, in combination with guides, G, G, and cover C, when arranged to operate in the manner and for the purposes set forth. STREET SPRINKLER—C. O. Luco, of Brandon, Vt.: I claim the combination of the water reservoir, C, horizontal rotating discharging wheels, H, H, operated from the wheels, B, of the carriage, substantially as shown, and the conveying pipes, I, I, provided with the cocks, J, J, the whole being arranged as shown for the purpose set forth. [The common arrangement for sprinkling streets is a perforated tube extending across the back end of a cart, and receiving its supply from a hogshead. This improvement embraces two horizontal wheels secured on the axle of the wagon, and receiving their water from the reservoir. As the cart is drawn along, these wheels revolve, and sprinkle the streets by water thrown out by centrifugal action. The quantity of water supplied to the wheels is regulated by cocks.] CHURNS—H. N. Mackey, of Morgantown, Va.: I claim the combination of the oblique wings with the double-headed self-acting pistons passing through them, operating as and for the purposes set forth. REVOLVING LAST HOLDERS—Benjamin Marshall, of Philadelphia, Pa.: I claim nothing in the idea of a revolving arm and shaft, or a holder combined with it and the last attached. But I claim, first, the screw, V, and nut W, in combination with the inclined plane, U, for the purpose of raising and lowering the torest, L, and swinging it back and forth, all arranged in the manner substantially as set forth. Second, I claim the combined arrangement of the crank or eccentric, R, with the revolving shaft, F, and the attachment of the elastic band, S, or its equivalent at the wrist, l and t, the set screw, f, substantially as described. OIL PRESS BOXES—Wm. W. Marsh, of Jacksonville, Ill.: I do not claim generally the use of longitudinal guides or flanges at the sides of the trusses to guide the boxes to and from the trusses, and keep the hinged side of the boxes closed. But I claim the employment upon the upper sides of the trusses, of the longitudinal guides, B, B, of such form, substantially as described, that while they serve to conduct the boxes to and from the press, and to confine the hinged sides against the outward pressure, they also serve to connect the trusses with the boxes for the purpose specified. [This invention relates to vertical oil presses. The upper sides of the trusses are furnished with guides so formed that while they serve to guide the boxes into and out of the press, they also connect the trusses with the boxes immediately above them in such a manner that the weight of the trusses aids in drawing the boxes of the pistons which operate in them, thereby opening the press, when the ram is allowed to return after having pressed all the oil out the meal—a good improvement.] PAINT CANISTERS—J. W. Masury, of Brooklyn, N. Y.: I claim the use of metallic cans for putting up paints, or other substances of any known form with ears attached thereto through which a wire ball may be passed in such a manner as not to interfere with the packing of the cans, and to render it at once a package for transporting the paint, and a convenient and useful pot or pail out of which to use the same, with a removable cover secured to the can, in the manner and for the purposes described and represented.

PHOTOGRAPHIC BATHS AND PANS—George Mathiot, of Washington, D. C.: I claim to construct the baths and vessels for photographic uses of an impervious substance formed by the combination of a cement with an earthy matter or its equivalent; and also to form the bath or other vessel by first forming the vessel of unglazed pottery or its equivalent, and making the pottery impervious by saturating it with wax, gum, balsam, resin, pitch, stearine or siccativo oil, or other equivalent for any one of these. COP-TUBES—John Marland and Earlsworth Crockett, of Lawrence, Mass.: We do not intend to limit ourselves to the precise method described of forming the tubes. We lay no claim to the machine upon which the tubes are made, as that forms no part of our invention. We claim a cop-tube formed of gutta percha prepared in the manner substantially as set forth for the purpose specified. SAILS AND RIGGING OF VESSELS—George T. May, of Tompkinsville, N. Y.: I am aware that boats and small vessels having one or more masts unsupported by rigging, and depending for support upon the hull, have been fitted with sails that have or may have a full semi-circular sweep, and I do not, therefore, claim broadly the use of a sail having such sweep. But I claim the use of a self-supporting "set" of masts, whether the same is composed of two or more masts, they being stayed and sustained by rigging whose spread at the line of the deck shall not exceed the lines of the distance between the forward part of the pivot mast and the forward part of the spring mast of the set, as set forth. WASHING MACHINES—Josiah Mayes, of Cohoes, N. Y.: I do not claim the beaded strips, d, g, irrespective of their peculiar position and arrangement, as shown, for they have been previously used. Neither do I claim a rotating reciprocating rubber placed within a tub, for they are well known and in common use. But I claim attaching the beaded strips, d, g, to the bottom, E, of the tub, B, and the face of the rubber, C, substantially as shown and described, for the purpose set forth. TEMPERING STEEL PLATES—Henry A. Seymour, of Bristol, Conn.: I claim the employment of the perforated plates, D, D, and the water cooling boxes, B, B, substantially in the manner and for the purpose as set forth. BOMB LANCES—Rufus Sibley, of Greenville, Conn.: I claim causing a bomb lance or projectile to take the wings that are to guide it through the air or water, from the muzzle of the gun from which it is discharged, substantially in the manner set forth. I also claim sloping the muzzle of the gun so that the wings may come back and close down to the barrel, substantially as set forth. EXCAVATOR—Samuel W. Soule, of St. Louis, Mo.: I claim the frame, d, lever, d', lugs, g, h, rod, i, and pins or lugs, j and j', and projection, k, or their equivalents, for the purpose of mechanically operating a scraper, as described. TENONING BLIND SLATS—Lafayette Stevens, of Elmira, N. Y.: I claim the movable and reversible gage, D, as described, in combination with the sliding table, C, arranged and operating in connection with the mandrel head, I, as made, and cutters, k, and spur, b', as described, and for the purpose set forth. SELF-ADJUSTING SACK HOLDER—Augustus Stoner, of Mount Joy, Pa.: I claim the spring, G, and the adjustable base, E, by means of the screw and burr, H, and piece, c, and the hopper, D, when combined, substantially as set forth. CONSTRUCTING LETTERS FOR SIGNS, &c.—Thomas Motley, of Brooklyn, N. Y.: I claim the new manufacture of frame or skeleton letters described, that is, the outline of each letter or numeral is formed of a skeleton frame, open both front and back, or entirely through, as shown. WINDMILL—Rufus Nutting, of Randolph, Vt.: I claim the construction of a horizontal wind power, with a regulator or clasp, operated by centrifugal force, which shall regulate the amount of surface of wing or sail opened to the wind, substantially as described. Also an arrangement by which the regulator or clasp may be conveniently set at any time by the operator, in such position as to prevent the wings from opening too far, or at all, as is desired. SETTING HEAD-BLOCKS OF SAW MILLS—Ira Robbins, of Unityville, Pa.: I claim the combination of the lever catch, S, spring, S', cords, p, p' and g, weight, r', stud, t, and lever, L, in connection with the lever, K, operating as and for the purposes described. PLANING HOOPS—Thaddeus S. Scoville, of Elmira, N. Y.: Machines with rotary cutters have been used for dressing hoops. India rubber feed rollers and elastic guides have been used; these I do not claim. But I claim the employment of a concave guide, c, c, arranged with a hinged portion immediately before the cutters, which is held in place by a spring having less pressing force than the counter gage roller, E, in combination with said gage roller, or its equivalent, substantially in the manner and for the purposes set forth. WINDING WADDING—Thomas Thompson, of Niverville, N. Y.: I claim the apparatus substantially as described, for removing the full roller, and supplying or depositing the empty roller, or the equivalent thereof, for the purposes substantially set forth. I also claim the devices covered by the first claim or their equivalents, in combination with the rollers arranged to divide or break the wadding or other material wrought, substantially as described. RAILROAD CHAIR MACHINES—Corydon Winch, of Jersey City, N. J.: I am aware that a number of machines have been devised for making railroad chairs from wrought iron, and dies operated by cams, or their equivalents, have been used and arranged in various ways in connection with cutters, benders, &c. I therefore do not claim separately, or in itself considered, either of the parts described, or any of the peculiar construction and arrangement of the same. But I claim the two bending and upsetting arms or bars, Q, Q, having their upper surfaces made inclined, and provided with ledges or flanges, k, k, at their inner ends, the bars being operated or moved, as shown and described, so as to both bend and upset the lips, a, and thereby increase the thickness, and consequently the strength of the lips where most required, viz., at the junction of the lips with the plate or base of the chair. [This machine has dies, cutters, punches, beveling and upsetting arms, a drop mandrel, and a clearing device, so arranged and operated that the wrought iron railway chairs are formed in a very perfect manner at one continuous operation, from bars.] SKATES—John A. Winslow, of Roxbury, Mass.: I claim the application of a second metal runner to the skate, which being placed on the bottom outside of the central line of axis, and the runner in the ordinary skate which lies along that line removed to a correspondent position on the other side, completes the improvement. WASHING MACHINES—Henry D. Youry, of Junius, N. Y.: I claim the mode of operating the apron, 6, to give its surface a slower motion than the surface of the rubber, 5, in combination with the shaft, 8, and apron, 6, the side plate and hook, 13, constructed and operated in the manner and for the purposes set forth. PURIFYING OILS—Halvor Halvorson, of Cambridge, Mass. (assignor to himself, Edward H. Baker, J. F. Athearu, and W. Tracy Eustis, of Boston, Mass.): I do not claim clarifying oils by means of caustic lye, and subsequently washing out the stearine soap by means of alcohol. But I claim in the process of manufacturing or purifying oils, the employment of alcoholic solutions of alkali, in the manner substantially as set forth. REVERSING THE CHISELS OF MORTISING MACHINES—Moses Marshall, (assignor to himself and Russell Dyar,) of Lowell, Mass.: I claim the projection, c, on the pawl, J, so constructed and arranged as to press back the bolt, H, when moved in one direction and release the collar, G, so that it may be turned by the pawl, J, to reverse the chisel, and also that if the projection c, will pass outside of the pin, e, when moved in the other direction, substantially as described for the purpose set forth. I also claim the slotted lever, Q, chain, O, and lever, U, or their equivalent, so constructed and arranged as to turn the collar, K, and reverse the chisel, as described.

ANCHOR TRIPPERS—John B. Holmes, (assignor to himself and John R. Pratt,) of New York City: I do not claim the various parts when separately considered. But I claim the combination of the thread or screw, E, working in a spiral groove or nut with the shaft or bolt, D, when arranged in the manner and for the purpose substantially as described, whereby I am enabled to relieve the chain and trip the anchor at an instant, in the manner set forth. MAKING PAPER BAGS—Benjamin F. Rice, (assignor to Benjamin R. Smith and Charles H. Morgan,) of Clinton, Mass.: I claim a combination of machinery composed of machinery for bending a strip of paper around a former, e, and into a tubular form, so that one edge may be lapped over the other, as described; machinery for pasting such edges, or one of them, and closing or pressing them together, and machinery for cutting the tube crosswise, as described. I also claim the combination of machinery for bending a strip of paper around a former, e, and into a tubular shape, so that one edge may be lapped over the other, as described; machinery for pasting such edges, or one of them, and pressing them together, machinery for cutting the tubes slantwise, as specified, while it is on the former or holder, and machinery for pasting or cementing the said tube near its front end, and bending or lapping the end of the tube on the cemented part, so as to form the bottom of the bag, and discharge said bag from the machine, as specified. I also claim arranging the pitch line of the feeding gear, w2, in or about in the prolongation of the axis of the shaft of its crank, whereby we obtain intermittent and variable motions of the paper, as described. I also claim arranging and operating the cutting knife with respect to the former, e, so as to cause said knife to cut obliquely across the end of the former, and through the tube of paper, as set forth. I also claim the combination of the presser, the bending and discharging rollers or their equivalents, the whole being made to operate together, substantially as described. I also claim combining with the rollers, m, n, the mouth bars or scrapers, l2, applied thereto, in manner and for the purpose as set forth. I also claim the improved construction of the cutting knife, viz., with a serrated edge beveled, substantially as set forth. GAGES FOR CASES—John W. Cochran, of New York City: I do not intend to confine myself to this particular manner of constructing my gage, but in any way, so long as it is substantially the same in effect. I claim, first, the arrangement of the sliding plungers and set screws in relation to the connecting rods and measuring arms, by which I am enabled to work each arm independent from the other and gage cases or vessels, whether the bung hole is in the center, in the head, or elsewhere. Second, I claim making the measuring arms adjustable, as set forth. SPLITTING WOOD—Waterman L. Ormsby, of Jersey City, N. J.: I claim, first, the arrangement of the chisels in broken or serrated, and in diagonal lines, according to the nature of the wood to be split. Second, the arrangement by which the pieces of one row do not coincide, but alternate with those of an opposite row. Third, the feeding apparatus and clamp, inclined as represented, by which sticks put into the feeding boxes require no further attention or handling till they drop as kindling wood from the splitting chisels. Fourth, the combination of the feeding, sawing and splitting apparatus, substantially as described, by which greater economy of time and power in preparing kindling wood is achieved than has been hitherto attained. I also claim, fifth, the combination of the guide grooves in the flanch of the hopper, thereby avoiding the introduction of separate guide plates for the chisels. RE-ISSUES. MILL FOR RE-SAWING BOARDS, &c.—Pearson Crosby of Fredonia, N. Y. Patented Nov. 3, 1841; re-issued March 10, 1859; extended Oct. 30, 1856; I claim the mode of operation substantially as described, of a saw, which mode of operation results from combining with a slitting saw the mechanism substantially as described, for guiding and guiding one face of the boards, and the mechanism for making a self-adjusting pressure, substantially as described, on the opposite face of the boards so that the boards will be clamped between the two said mechanisms on opposite faces, and immediately in front of the cutting edge of the saw, so as to prevent the aged face of the boards, however warped or bent they may be, in a plane parallel with the plane of the saw, as set forth. And I also claim, in combination with a slitting saw, the arrangement of the gage and pressure rollers, substantially as described, connecting the said gage and pressure rollers with the mechanism from which they derive motion by means of universal joints, substantially as and for the purpose specified. And I also claim the method substantially as described of hanging and straining the saw, by the combination of the three struts at the ends of the saw, constructed and connected in the manner substantially as described. GAS BURNERS—Charles H. Johnson, of Boston, Mass.: I claim elevating the orifice of injection, a, above the base of the burner, by means of a cone, or its equivalent, raised on said base, and into the chamber of the burner up into the distributor or among its wires, as described, in order that advantages as stated may be attained. Passenger Coal-Burning Locomotives Successful. Coal-burning locomotives have been very successful as freight engines; but to use bituminous coal—the most abundant in the West—they must be able to burn their smoke, or they will not answer for passenger engines. The locomotive which was illustrated and described on page 160, this Vol., SCIENTIFIC AMERICAN, which burns its smoke, has been quite successful as a passenger engine. A copy of the Chicago Times of April 16th comes to us "marked" containing an extract, in which it is stated that two such locomotives, built by Mason & Co., Taunton, Mass., have been put on the Illinois Central Railroad, to burn the common coal of that State. Respecting the last engine put on, the Times says:—"Not discouraged by some difficulties met with in introducing the first engine, they have put on a second, and this has run the passenger train between Chicago and Urbana for a fortnight past, probably not one passenger out of fifty knowing that the engine was burning coal. To test the machine more completely several of the officers of the road left Chicago last week for Cairo, thence to Dunleith, and back to Chicago, via Mendota—a grand circuit of 1,044 miles, run with one engine; and the whole was performed without the slightest delay or accident, or any failing in the tireless steed. The consumption of coal during the trip was six tons. This experiment is the most successful of those which have yet been tried with Illinois coal, and the result is likely to be of the greatest importance in railroad economy."