

toothed wheel C forming a part of said driver, the driving pinions, as B and Cr, in mesh with said wheels respectively, the shafts, as H and F, arranged one within the other, the driving sheave, as G, on the exterior shaft, and the clutch connecting said shafts, whereby they may be driven in unison or independently, all arranged to operate substantially as set forth. 4th. A portable drilling machine, having its base-piece, as D, provided with an aperture for the passage of the drill, and provided also with a tubular male screw, as J, for securing the drill in the proper position for drilling, said tubular attaching screw being adapted to embrace the drill, as set forth. 5th. The combination, with a portable drilling machine having its base-piece or stock provided with a tubular male screw J, for securing the drill to a templet, of a templet provided with a female screw to receive the said male screw on the drilling machine, which latter screw embraces the drill and centers it, as set forth.

No. 30,741. Combined Cultivator, Scraper and Roller. (*Cultivateur-grattoir-rouleau.*)

William Huggins, Bushnell, Mich., U.S., 8th February, 1889; 5 years.

Claim.—The garden implement comprising the beams or handles B, the roller G journaled between the beams, the oblique horizontal cutter M, the beams adapted to carry the cultivating teeth P, the said cultivating teeth having their standards secured to opposite sides of the beam from the cutter M, substantially as described.

No. 30,742. Range and Position Finder. (*Micromètre.*)

Bradley A. Fiske, New York, N.Y., U.S., 8th February, 1889; 15 years.

Claim.—1st. The method of determining the angular change in position of a body moving about a centre, which consists in measuring the electrical resistance of a conductor extending between the initial and final positions of said body. 2nd. The method of determining the change of position in arc of a body moving about a centre, which consists in measuring the electrical resistance of a continuous conductor forming an arc of which said body is a radius, and extending between the initial and final positions of said body. 3rd. The method of determining the angle included between two lines of sight directed upon a distant object, which consists in, first, directing two pivoted radial sight tubes, located at opposite ends of a base line longitudinally in line with said object, the said tubes being pivoted at one extremity, and having their other extremities moving over arcs of conducting material having a known ratio of electrical resistance per unit length, second, placing one tube parallel with the other tube, third, measuring the electrical resistance of the arc included between the initial and final positions of said last-mentioned tube. 4th. The combination, with circuit connections, a source of electricity, an indicating device, such as a galvanometer and a variable resistance, said parts being united in a wheatstone bridge, of a radial arm moving on a centre, to which arm one member of said bridge is connected, and an arc of conducting material to the extremity of which the adjacent member of said bridge is connected, the free end of said radial arm moving over and maintaining electrical contact with said arc. 5th. The combination, with circuit connections, a source of electricity and an indicating device, such as a galvanometer, said parts being united in a wheatstone bridge, of a radial arm moving on a centre to which one member *c* of the bridge is connected, an arc of conducting material to the extremity of which the adjacent member *a* of said bridge is connected, a similar arm moving on a centre to which the third member *d* of the bridge is connected, and a similar arc of conducting material to the extremity of which the fourth member *b* of said bridge is connected, the said radial arms moving over and at their free ends, maintaining electrical contact with their adjacent arcs. 6th. The combination with circuit connections, a source of electricity, and an indicating device, such as a galvanometer, said parts being united in a wheatstone bridge, of two arcs of conducting material uniting the extremities of the opposite pairs of adjacent members of said bridge, as *a, c* and *b, d*, two radial pivoted arms maintaining at their free ends electrical contact with said arcs and conductors respectively, leading from opposite poles of the source of electricity to said arms. 7th. The combination of the four members *a, b, c, d* of a wheatstone bridge, two arcs *h, h'* respectively interposed between members *a, c* and *b, d*, two pivoted radial arms *i, i'* respectively having their free ends moving over and maintaining electrical contact with said arcs, a source of electricity having one pole connected to one of said arms, and the other pole connected to the other of said arms, two bars of conducting material respectively interposed between members *a, b* and *c, d*, contact pieces adjustable upon each of said bars, a loop conductor connected at its ends respectively to said contact pieces, and an indicating device, such as a galvanometer in said loop. 8th. The combination of the four members *a, b, c, d* of a wheatstone bridge, two arcs *h, h'* respectively interposed between members *a, c* and *b, d*, two pivoted radial arms *i, i'* respectively having their free ends moving over and maintaining electrical contact with said arcs, a source of electricity having one pole connected to one of said arms, and the other pole connected to the other of said arms, a circuit breaker interposed between said source of electricity and one of said arms, two bars of conducting material respectively interposed between members *a, b* and *c, d*, contact pieces adjustable upon each of said bars, a loop conductor connected at its ends respectively to said contact pieces, and a telephone in said loop.

No. 30,743. Sulky Plough. (*Charrue à siège.*)

Nelson Lampman, Woodstock, Ont., 8th February, 1889; 5 years.

Claim.—1st. In a sulky plough, tongue E, frame beam A, main frame A¹ and plough beam C, all formed and combined substantially as and for the purpose hereinbefore set forth and shown. 2nd. In a sulky plough, the combination of frame beam A, foot-lever H and hanger I, substantially as and for the purpose hereinbefore set forth.

No. 30,744. Balanced Valve for Steam Engines. (*Soupape équilibrée pour machines à vapeur.*)

Chilion M. Farrar, Buffalo, N.Y., U.S., 8th February, 1889; 5 years.

Claim.—1st. A balanced steam valve, consisting in the combination of a steam chest, having an upper and lower steam chamber, divided by a sheet metal diaphragm, a valve located in the lower chamber, the usual mechanism for operating it, a plate seated on the top of the valve filling the space between the valve and the diaphragm, and a steam passage connecting the upper and lower chambers, substantially as and for the purpose described. 2nd. In a balanced steam valve, the combination of a steam chest, having an upper and lower steam chamber divided by a sheet metal diaphragm a valve located in the lower chamber, the usual mechanism for operating it, a plate seated on the top of the valve, having an upward portion provided with a top piece adapted to screw up or down on the same, so as to adjust the two parts between the valve, and the diaphragm and a steam passage connecting the upper and lower chambers, substantially as and for the purposes described. 3rd. In a balanced steam valve, the combination, with the steam chest, of a sheet metal diaphragm secured steam tight to the upper portion of the same, a valve having a plate seated thereon and provided with a cylindrical portion projecting upward, and a top piece adapted to screw on said portion, so that the two parts may be adjusted between the top of the valve and the underside of the diaphragm, for the purposes described.

No. 30,745. Compound for Improving the Quality of Steel. (*Composition pour améliorer la qualité de l'acier.*)

Catharine Schaefer (administratrix to the estate of Adam Schaefer) Philadelphia, Penn., U.S., 8th February, 1889; 5 years.

Claim.—The compound for improving the quality of steel, consisting essentially of rosin, glycerine, linseed oil and carbon, substantially in the proportions hereinbefore recited.

No. 30,746. Letter and Document File. (*Serre-papier.*)

William Robertson, Mount Forest, Ont., 9th February, 1889; 5 years.

Claim.—1st. A drawer A, having rollers or projecting pins K, to rest on the curved track J and support the inner end of the door A, in combination with the spring B, arranged substantially as and for the purpose specified. 2nd. The combination, with a clamping board B, of a spring C provided with a roller *a*, and designed to impart a downward pressure on the said clamping board, substantially as and for the purpose specified. 3rd. A drawer A, designed to contain documents below the clamping board B, against which a downward pressure is imparted by the roller *a*, actuated by the spring C, a spring wire F connected to the cabinet, and fitting into a hole made in the bracket G, attached to the drawer A and actuated by the eccentric H, in combination with the rollers or projecting pins K attached to the inner end of the drawer, and resting upon the track J, and with the spring E, arranged substantially as and for the purpose specified.

No. 30,747. Railroad Switch and Signal and Apparatus for Connecting and Operating the Same. (*Aiguille et signal de chemin de fer et appareil pour les raccorder et manoeuvrer.*)

Henry F. Parsons, New York, N.Y. (administrator of the estate of Annie I. Parsons, Denver, Col.), U.S., 9th February, 1889; 5 years.

Claim.—1st. A railway switch, comprising a switch-bar, a worm-gear operating lever, a worm-shaft meshing therewith, all arranged at the side of the track, an endless bar, chain cable or the like, and vertical levers connected thereto to move it in opposite directions, and means, substantially as described, for actuating said vertical levers to rotate said worm shaft and thereby actuate the worm-gear lever, and simultaneously lock it and consequently the switch in desired position, substantially as set forth. 2nd. A railway switch-operating mechanism, comprising an endless rod, chain, cable, rope or the like, mounted upon pulleys, a series of vertical levers to move said rod in either of two directions, and a switch lever having a worm gear and a worm shaft connected to said rod, and all arranged at the side of the track, combined with signals connected to said endless rod and operated by the operating of the switch, substantially as set forth. 3rd. The combination of the endless rod or its described equivalent, and a series of vertical levers, flexibly connected in order to the upper and lower members of said rod, with a switch mechanism comprising a switch bar, a worm-gear segmental lever connected thereto, and a worm-shaft connected to, and rotated by the movement of the said rod, the whole arranged parallel to the rails, substantially as described. 4th. A switch operating mechanism comprising a switch bar and rails as usual, and two series of alternately rising and falling, or reversing levers, connected with the switch bar, and each by its operation, in one way causing the other to operate in the reverse direction thereby always to present for use one or the other series of levers, substantially as described. 5th. A switch bar and locking mechanism connected therewith, which is also its operating medium, combined with series of rising and falling levers connected with said operating medium, and arranged to work in series, so as to insure the presentation of one or the other series in operative position for reversing the last movement of the switch, substantially as described.

No. 30,748. Kerosene Lamp Burner. (*Bec de lampe à kérosène.*)

Thomas Fitzgerald, Revere, Mass., U.S., 9th February, 1889; 5 years.

Claim.—In a kerosene lamp burner, the single cone B provided