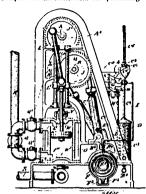
adjusting bars connected to said gaugs at or near their inner ends, springs bearing downwardly upon said bars, a crunk-shaft baring upon said springs, and means for holding the same at any point of adjustment, substantially as set forth. 8th, A harrow having two pivotally mounted gaugs of disc, adjusting bars connected to said gaugs at or near the inner cuts thereof, two plate-springs located over said bars and having bent or curved portions constantly held in contact with said bars, and neans for adjusting the tension of said springs, substantially as set forth. 9th, A harrow having two pivotally-mounted gaugs of discs, adjusting bars connected to said gaugs at or near the inner cuts thevof, two plate-springs having bent ends provided with slots through which said bars are passed said springs having inwardly extended portions bearing upon said bars, substantially as set forth. 10th, A harrow having its draft-famo provided with a rigid-bar, two gaugs of discs having angularly slotted cars near their outer ends engaged by said rigid bar, two adjusting bars connected to said gaugs at or near their inner ends. adjusting bars connected to said gangs at or near their inner ends, stotted cars near their outer ends engaged by said rigid bar, two adjusting bans connected to said gangs at or near their inner ends, and a spring located between said adjusting bars and bearing outwardly thereon, substantially as set forth. 11th. A harrow having two pivotally mounted gangs of discs, adjusting bars con-nected to said gangs at or near the inner ends thereof, two plate-springs secured at or near the inner ends thereof, two plate springs secured at their outer ends and having inwardly bent portions at their inner ends, said latter ends having slots through which said at their inner ends, said latter ends having slots through which said bars project, and a tension regulator bearing on said springs near their secured onds, substantially as set forth. 12th. A harrow having two pivotally mounted gangs of discs, adjusting bars connected to said gangs at or near the inner ends thereof, two plate springs secured at their outer ends and having inwardly bent portions at their inner ends, said latter ends having slots therein through which said bars project, a crank-shaft designed to bear on said springs at saul bars project, a craik-shart designed to bear on said springs at or near their secured ends, and means for adjusting and holding said crank-shaft, saubstantially as set forth. 13th. In a harrow the combination with the draft-frame and the pole, said frame having a rigid bar provided with hooked ends, of the two games of discs having cars near their outer ends provided with angular slots therein for reception of the said hooked ends of said bar and the ears and plates also extending from said gaugs near the inner ends therrof, said cars and plates having openings therein, the ad-usting bars having their inner ends extended through the said openings of said cars and nince ends extended through the said openings of said ears and plates, the plate-springs secured at their forward ends to said draft-frame and bearing upon said adjusting bars at or near the lower ends of the latter, and a crank-shift for engaging said springs near their secured ends, substantially as set forth. 14th. The combina-tion with the draft-frame, and the two gangs of discs protally con-nected thereto, of the adjusting bars connected to the inner ends of said gangs, the plate-springs secured at their outer ends to said draft-frame and having inner slotted bent ends through which said bars project, and the crank-shaft having rollers thereon designed to bear upon said springs, substantially as set forth. 16th. The combination with the draft-frame, the gangs of discs, and the adjusting bars, of the springs bearing on said bars, the crank-shaft designed to bear upon said springs, the foot-lever fulcruned to said crankto bear upon said springs, the foot-lever fulcruined to said cranishatt, the toothed quadrant, and means for normally holding said foot-lever in engagement with said quadrant, substantially as set forth. 16th. The combination with the draft-frame, the gauge of dises, and the adjusting bars, of the springs bearing on said bars, the crank-shaft designed to bear upon said springs and having an outer angular and, the foot-lever fulcruined on said crank-shaft and having a side-recess to accommodate said angular end, an interposed spring normally forcing said lever inward, and the quadrant designed to be engaged by said lever, substantially as set forth. Irth. In a disc-harrow having an upper frame, a series of scrapers, a movable bar loosely held to said frame and to which said scrapers a movable our nosery man to san traine and to when son so so sometime are connected, and a spring or springs for binding said movable bar and holding the same at any point to which adjusted, substantially as set forth. 18th. In a discharrow having an upper frame, a series of scrapers, a movable bar loosely held to said frame and to which said scrapers are connected, and a frictional clutch for binding said bar at any point to which adjusted, the same comprising a spring and an inner member held by said spring tight against said movable bar, substantially as set forth. 19th. In a disc-harrow, having an upper frame, a series of scrapers having a bar loosely connected to said frame, means for adjusting said bar, and a spring-pressed lug or lugs designed to bear upon and hold said bar at any point to which adjusted, substantially as set forth. 20th. In a discharrow having an upper frame, a series of keeper-plates secured to said frame having openings therein, a series of scrapers having a bar movable in said keeper-plates, a lug located in said opening of said keeper-plates, and a spring bearing on said lug, substantially as set forth. 21st. In a disc-harrow having an upper frame, a series of keeper-plates seared to said frame having openings therein, a series of scrapers having a har movable in said keeper-plates, a lug located in said opening and having a head flanged at its ends, and a plate-garing secured at one end, its free end bearing on said head of said lug and fitting between said end flanges, substantially as set forth. having an upper frame, a series of scrapers having a bar loosely

No. 48,808. Motor. (Moteur.)

Leon Abbett, Hoboken, New Jersey, assignce of Lowis Boyd White, New York, State of New York, both in the U.S.A., lat May, 1835, 6 years.

Claim-1st. The method of operating a motor by means of com-

pressed carbonic acid, consisting in alternately heating and cooling the carbonic acid for producing the power, by alternately bringing it in contact with heated and cooled carbonic acid, substantially as herein described. 2nd. The method of operating a motor by means of compressed carbonic acid, consisting in alternating heating and cooling the compressed carbonic acid for producing the power, by



alternately bringing it in contact with heated and cooled carbonic

acid, and subjecting it to pressure while in contact with the couled carbonic acid, substantially as herein described. 3rd. The method carbonic acid, substantially as herein described. 3rd. The method of operating a motor by means of compressed carbonic acid, consisting in alternating heating and cooling compressed carbonic acid in one and the same vessel, substantially as herein described. 4th. The method of operating a motor by means of compressed carbonic acid, consisting in alternately heating and cooling the carbonic acid in one and the same vessel and subjecting is to pressure while cooling it, substantially as herein described. 5th. The method of operating a motor by means of compressed carbonic acid consisting in attending it in a chanding it is a closely vessel by useans of heat, than couling it in expanding it in a closed vessel by means of heat, than cooling it in the same vessel and at the same time subjecting it to pressure in the same vessel, substantially as herein described. 6th. The method the same vessel, succeasing as neven described. On. The memor of operating a two cylinder motor, each of single struke, by means of compressed carbonic acid, consisting in heating the compressed carbonic acid in one cylinder and at the same time cooling the carbonic acid in the other cylinder, substantially as herein described. bonic acid in the other cylinder, substantially as herein described. 7th. The method of operating a two cylinder motor, each cylinder of single stroke, by means of compressed carbonic acid in one cylinder, then equalizing the pressure of the compressed carbonic acid in the two cylinders and then cooling and compressing the carbonic acid in the excent cylinder, substantially as herein described. 8th. The method herein described of operating a two cylinder motor, each of single stroke, by means of compressed carbonic acid, consisting in producing the pressure in the cylinder having its plunger on the outstroke, equalizing the pressure in both cylinders, when the pistons are on the half stroke and cooling the carbonic acid in the second cylinder when the plunger of the same is on the second half second cylinder when the plunger of the same is on the second half of the instroke, substantially as herein described. 9th. In a motor, of the instroke, substantially as herein described. 9th. In a motor, the combination with a cylinder and a plunger therein, of a single conducting pipe connected with the cylinder and separate chambers arranged in the length of said pipe for heating and cooling the motor fluid in said pipes, substantially as herein shown and described. 10th. In a notor, the combination with a cylinder, and a plunger therein, of a single pipe connected with the cylinder, a heating chamber and a cooling chamber arranged in the length of said pipe, means for heating the heating chamber and means for cooling the cooling chamber, substantially as herein shown and described. 11th. In a motor, the combination, with a cylinder and a plunger therein of a single pipe connected with the cylinder and a plunger therein of a single pipe connected with the cylinder and heating chamber and a cooling chamber arranged in the length of and a number therein of a single pipe connected with the cylinder heating chamber art aged in the length of said pipe, means for heating the heating chamber, and means for cooling the cooling chamber at intervals, substantially as herein shown and described. 12th. In a motor, the combination, with a eylinder and a plunger therein, of a single pipe connected with said cylinder, a heating chamber and accoling chamber formed in the length of said pipe, means for heating the heating chamber, and means for flowing water upon the cooling chamber, substantially as herein shown and described. 13th. In a motor, the combination, with a cylinder, and a plunger therein of a single pipe connected with said cylinder, a heating chamber and a cooling chamber formed in the length of said pipe, means for heating the heating chamber, means for means for flowing water upon the cooling chamber, and means for interrupting the flow of water, substantially as herein shown and described. 14th. In a motor, the combination, with a cylinder and a plunger therein, of a single pipe connected with said cylinder, a cooling chamber and a heating chamber formed in the length of said pipe and a concylinder and a plunger therein, of a single pipe connected with said