

the hinged shank K₁ provided at its lower end with the friction roller L₁, substantially as specified. 2nd. In an automatic indicator, the combination, with the indicator mechanism, and the tunnel way provided with the inclined wedges, of the spring rod or bolt provided with a head and the collar G₁, and the hinged shank K₁ provided at its lower end with the friction roller L₁, substantially as specified.

No. 26,632. Process of and Apparatus for Manufacturing Gas. (*Procédé et appareil de production du Gaz.*)

Burdett Loomis, Hartford, Conn., U.S., 6th May, 1887; 5 years.

Claim.—1st. In the manufacture of gas, the process of coking bituminous coal and heating such coked coal to incandescence for decomposing steam, which consists in passing the air blast or draft down through the ignited fuel, and periodically charging fresh bituminous coal on top of the fuel body, whereby the ashes and dust are blown down into the ash pit leaving the body of the coal porous for the passage of steam, and preventing the formation of clinker, and whereby the formation of a tarry coating on top of the fuel is prevented and improved results secured. 2nd. The process of manufacturing gas, which consists in coking bituminous coal, and suitably heating such coked coal by passing the air blast or draft down through it for keeping it clear of ash and clinker, adding fresh bituminous coal as required, and decomposing steam by passing it through the heated fuel and distilling coal, whereby a mixture of water gas and carbureted hydrogen is produced. 3rd. The process of making illuminating gas by forcing air downward into and through the fuel, thereby better coking it and heating it to the decomposing temperature for steam, causing combustion of the resulting gaseous products, and conducting the hot products through the regenerator for heating it, then decomposing steam by passing it downward through the fuel, and conducting the resulting water gas through the ash-pit into the regenerator or fixing chamber, there adding hydrocarbon liquid or vapour, and then fixing the gas by passing it in contact with the heated refractory material. 4th. The process of manufacturing heating gas, which consists in heating two bodies of fuel by downward blast of air, heating two superheating and fixing chambers by burning the resulting gaseous products, then superheating steam by passing it through one of the superheating chambers, decomposing it by passing it through one body of heated fuel, then passing the resulting gases through the other body of heated fuel for converting the carbonic acid into carbonic oxide. 5th. The process of manufacturing gas, which consists in heating two bodies of fuel by downward blast of air, heating two superheating and fixing chambers by burning the resulting gaseous products, then superheating steam by passing it through one of the superheating chambers, decomposing it by passing it through one body of heated fuel, then passing the resulting gases through the other body of heated fuel for converting the carbonic acid into carbonic oxide, then carbureting the water-gas and fixing it by passing it through the heated fixing-chamber. 6th. The process of generating gas, which consists in passing superheated steam up through a body of incandescent fuel for decomposing it, then admitting crude oil, tar, or liquid asphaltum into the resulting hot gas, and passing it down through a second body of heated fuel for converting such oil, tar or asphaltum into gas, then carbureting the gas if required and fixing it by passing it through the heated fixing-chamber. 7th. The process of manufacturing gas, which consists in superheating steam, then decomposing it in contact with a body of incandescent fuel, and at the same time distilling bituminous coal on top of and in contact with the body of incandescent fuel, and causing the resulting gas and vapours to pass downward into the heated fuel below for converting them into fixed gas, and finally conducting off the coal-gas and the water-gas together some distance below the surface of the fuel, whereby fresh charges of bituminous coal are successfully coked and the hydrocarbons distilled therefrom converted into fixed gas. 8th. The process of manufacturing gas, which consists in heating a body of fuel to incandescence by blasting with air, and by means of the resulting hot products heating a chamber containing refractory material, then shutting off the air and superheating steam in contact with the hot refractory material, decomposing it in contact with the incandescent fuel, and at the same time distilling bituminous coal in the form of lump or slack in contact with the incandescent fuel, and causing the resulting gas and vapour to pass down in contact with the incandescent fuel for converting them into fixed gas and finally conducting off the coal-gas and water-gas together below the more recent charge or charges of fresh coal, whereby the coal is better coked, the formation of hard crusts by excessive heat is avoided, and the hydrocarbons are converted into fixed gas. 9th. The process of manufacturing gas, which consists in heating two bodies of fuel to incandescence by blasting with air burning the resulting gaseous products, and thereby heating two superheating and fixing-chambers, superheating steam by passing it through one superheating chamber, decomposing it by passage up through one body of incandescent fuel, and at the same time causing distillation of fresh charges of bituminous coal in contact with the body of incandescent fuel, and passing the evolved gas and vapour and water-gas from below the recently charged coal into the second body of fuel below its surface, and down through it for converting carbonic acid into carbonic oxide and hydrocarbon into fixed gas, then carbureting the mixed gas by means of hydrocarbon liquid and finally combining and fixing the carbureted gas by passage through the heated fixing-chamber. 10th. In a gas apparatus, the generator having the air blast pipe connecting with its top, in combination with the regenerator for fixing gas or superheating steam connected with said generator by means of the ash-pit, and combustion-chamber below the grate, and a blast-pipe connected to supply air between the fuel and regenerator for the purpose set forth. 11th. The fuel and generating chamber having an air blast pipe connecting with its upper portion, in combination with the regenerator connecting with said generating chamber below the grate, and containing the vertical partitions or check-walls extending alternately from opposite side walls or top and bottom of the chamber, and an escape flue for products of combustion from the rear end or base of the regenerator, for the purpose set forth. 12th. The combination of the generator, with the regenerator or superheater connecting with such

generator at its base, and having a series of vertical partitions or check-walls made of fire-brick or other refractory material projecting alternately from opposite sides or top and bottom of said regenerator, so as to form the tortuous passage and such regenerator having cleaning openings and closing devices in its side walls, for the purpose described. 13th. A down blast gas generator having an air blast pipe connecting with its top, in combination with a regenerator for fixing gas or superheating steam, provided with partitions or check-walls extending alternately from the opposite side walls or top and bottom of the chamber, so as to form a tortuous passage. 14th. A down-blast gas generator having an air-blast pipe connecting with its top, in combination with a regenerator for fixing gas or superheating steam, connected with its bottom and provided with partitions or check-walls, as described, and a steam supply, for the purpose described. 15th. In a cupola gas generating furnace, the fuel chamber having gas education ports, flue and take-off pipe arranged at a distance below its top, in combination with an air blast pipe connecting with the top of the furnace, and a steam supply pipe connecting with the base of the fuel chamber, for the purpose described. 16th. In a cupola gas generating furnace, the fuel chamber having an air-blast pipe connecting with its top, and the gas education pipe connecting below its top, as described, in combination with the superheater and fixing or regenerator chamber placed at the base of the cupola, the connecting flue C₃ and vaporizing retorts extending transversely through the superheating and fixing chamber, and opening into flue C₃, for the purpose described. 17th. In combination with the fuel chamber of a cupola gas generator, the deep fire-clay grate-bars resting upon the floor of the chamber, for the purpose described. 18th. In a cupola gas generating furnace, the superheating and fixing chamber having vertical partitions or check-walls forming connecting flues and the vaporizing retorts extending transversely through the chamber and opening into a flue leading from the fuel chamber, for the purpose described. 19th. The two generating chambers connected at or near the top, in combination with the two superheating and fixing chambers connecting with the bases of the generating chambers, as and for the purpose described. 20th. The two fuel chambers connected by a pipe or pipes for the passage of gas from one to the other, in combination with the two superheating and fixing chambers having the vaporizing retorts, and the gas inlet pipes leading from the connecting gas pipes of the fuel chambers into the retorts, for the purpose described. 21st. In a cupola gas generator, the fuel chamber above, and the connected superheated and fixing chamber below, in combination with gas take-off pipes G and F, connecting pipe H, connecting valve boxes U, V, having seats at top and bottom, and the ball valves suitably hung so as to be adjustable upon either seat, for the purpose described. 22nd. The combination of the two fuel chambers and two superheating and fixing chambers connecting therewith, and the double steam boiler valves and pipes connecting the fuel chambers with each other and with the chambers of the boiler, and pipes and valves connecting the superheating and fixing chambers with the chambers of the boiler, whereby either gas or products of combustion may be passed through each chamber of the boiler, as described. 23rd. In combination with the double cupola generator, the double boiler and suitable connecting pipes and valves, and a gas pipe leading to a seat box, and a pipe for the escape of products of combustion having a valve at the top connecting with each chamber of the boiler, for the purpose described. 24th. The two fuel chambers and the two superheating and fixing chambers connecting with such fuel chambers, in combination with pipes F, E₁ having valve boxes and valves connecting the superheating and fixing chambers with the double boiler pipes G, G₁ and p, and valve boxes provided with double seats and ball valves connecting the two fuel chambers and the pipes H, H₁, connecting pipes G, G₁, with pipes F, E₁, through the medium of the valve boxes. 25th. The two fuel chambers connected by a valve pipe or pipes below their tops and below the level at which the fuel is maintained, in combination with two superheating and fixing chambers having steam supply pipes and valve take-off pipes for the gas and products of combustion, as described.

No. 26,633. Sash Balance.

(*Contre-poids de Croisée.*)

James McArthur, Rochester, N.Y., U.S., 6th May, 1887; 5 years.

Claim.—1st. In a sash-suspending device, a frame, a rotating spring-drum, with contained spring held by said frame, and suspending band for the sash secured to the latter and to said drum, in combination with a semicircular tension-band secured to said frame, substantially concentric with said drum bearing upon said suspending-band, to act as a tension therefor, said tension band acting upon said suspending-band only when the connected sash is approaching its uppermost position or increasing its action on said suspending band as said sash rises, substantially as described. 2nd. In a sash-suspending device, a frame, a rotating spring-drum with contained spring held by said frame, and suspending band for the sash secured to the latter and to said drum, in combination with a semicircular tension band secured to said frame, substantially concentric with said drum bearing upon said suspending-band to act as a tension therefor, said tension-band being held against said suspending-band by a spring p acting upon its free end, to press said suspending-band more firmly as said sash moves upward, substantially as described. 3rd. In a device for suspending a window-sash, a frame, a rotating spring-drum or holder with contained spring and band or suspender for the sash, secured to the latter and to said drum, a brake or retarder for said sash, in combination with springs p and r for said retarder, and threaded stud, and screw-nut, substantially as and for the purpose specified.

No. 26,634. Bed Bottom. (*Sommier de Lit.*)

William E. Long and Joseph H. Long, Brantford, Ont., 6th May, 1887; 5 years.

Claim.—A bed-bottom, with the side rails B formed of pipes, and having right and left hand screws with nuts, or having smooth ends and screwed ends C, with nuts D, in combination with casting E and G, substantially as and for the purposes hereinbefore set forth.