

pipes, the closed hot air chamber surrounding said retorts, the combustion chamber provided with a fire grate and connected with said hot air chamber by flues, the hot-air pipe adapted to connect the combustion chamber with an outside furnace, and the gas chamber below the retort, substantially as described. 7th. The combination of the air-tight retorts or ovens, with their escape pipes, the closed hot air chambers surrounding said retorts, the grate *b* upon the bottom of said chamber, the chamber *L*, pipe *N*, and means for injecting steam into the retorts, substantially as described. 8th. The combination of the closed hot-air chambers, their inclosed air-tight retorts, and the escape pipes *Y*, *Y*, with the perforated valve plate *G*, and means for injecting steam and air into said retorts, substantially as described. 9th. The combination of the closed hot air chambers, their inclosed air-tight retorts having escape pipes, and the pipes *T* for admitting steam into said retorts, substantially as described. 10th. The combination of the closed hot-air chambers, their inclosed air-tight retorts having escape pipes, pipes *T* for admitting steam into said retorts, and the steam super-heating pipes *R* having partitions *J* connected with said pipes *T* and inclosed within the super-heating chamber *M*, substantially as described. 11th. The combination of the closed hot air chambers, their inclosed air-tight retorts having escape pipes, pipes *T*, for admitting steam into said retorts, super-heating chamber *M*, the steam pipes therein, flues *W* and heating chamber *L*, substantially as described. 12th. The combination, of the closed hot-air chambers, their inclosed air-tight retorts having escape pipes and the air pipe *U*, substantially as described. 13th. The combination of the closed hot air chambers, their inclosed air-tight retorts, the air-tight chambers *E*, the valve-plate *G* and outlet doors *u* and *v*, substantially as described. 14th. The combination of the closed hot air chambers, their inclosed air-tight retorts, the air-tight chambers *E* and sliding grates *G*, and the pipes *T* and *U*, substantially as described. 15th. The combination, with the chambers *C* having perforated plate *a* and grates *b*, of the partitions *c* forming the chambers *E* and *E*, and the retorts *F* embracing the perforated plate *a* and the valve plate *G*, substantially as described. 16th. The combination, with the steam connection *S*, pipes *R* having partitions *J* and the coils *Q*, as shown, the pipes *T*, retort *F*, plate *a*, valve-plate *G*, substantially as described. 17th. In combination with the external structure *A*, *B*, and internal structure *A*, *B*, forming the chambers *C*, the masonry *K* forming the chambers *L* and *M*, the flues *V*, *W* and *X*, the dampers *a*, *p* and *q* and the grates *b*, substantially as described. 18th. The retort *C* having the covered extensions *P* and *H* and sliding grate or bottom *G*, in combination with the hot-air chamber surrounding the retort, substantially as described.

### No. 20,896. Combination Letter Sheet and Envelope. (*Papier à Lettre formant Enveloppe.*)

Daniel W. Clegg, Pleasantville, N. Y., U.S., 16th January, 1885: 15 years.

**Claim.**—1st. The combined letter sheet and envelope, consisting of a sheet of paper folded in legal paper form, and provided on one edge with a sealing flap, and on the edge adjacent thereto with a marginal flap not overlapping the folded section of the sheet, the two sections of the said marginal flap adapted, substantially as described, to be sealed together, so as to close the end of the folded sheet, substantially as described. 2nd. The combined letter-sheet and envelope, consisting of a sheet of paper folded near its centre and having on one edge a sealing flap gummed on its upper side, and on the edge adjacent thereto a marginal fold not overlapping the folded section of the sheet, and gummed on its under side, so that the two parts of said fold may be sealed together, substantially as described.

### No. 20,897. Well Boring Machine.

(*Machine à Forer les Puits.*)

William E. Brown, New York, U. S., 17th January, 1885: 5 years.

**Claim.**—1st. In combination with the supporting frame and the shears or mast hinged to the top of said frame, and extended to the base thereof, as shown, a windlass pivoted on the frame, and a rope connecting the foot of the mast with the windlass for hoisting and lowering the mast, substantially as described and shown. 2nd. The combination of the base *A* provided with the upright frames *B*, *B*, braces *C*, *C* and girders *D*, *D*, the shears *S* hinged on the frame *B*, the braces *E* hinged on the side of the shears, the shaft *F* provided with pinion *f* and crank *g*, the drum or shaft *P* provided with the gear *s*, and the rope *R* wound on said drum and connected with the foot of the shears, substantially as described and shown. 3rd. In combination with the shears *S*, rope-drum *a* and cam *q*, the lever *H* pivoted in proximity to, and nearly in the same horizontal plane with the said rope-drum, substantially as described and for the purpose set forth. 4th. In combination with the rope-drum *a*, the gears *b*, counter-shaft *a*, pinions *b*, crank *c*, brake-pulley *h* and brake-lever *h*, substantially as shown and set forth. 5th. In combination with the rope-drum *a*, the gears *b*, counter-shaft *a*, pinions *b*, pulley *i*, ratchet *k*, dog *k*, brake-pulley *h* and brake-lever *h*, all substantially as described and shown. 6th. In combination with the driving-belt *J*, the slush-pump drum *K* provided with the pulley *L*, the box *M* having the elongated bearing *l* and a lever for shifting the shaft of the drum *K* in said bearing, substantially as described and shown for the purpose set forth. 7th. In combination with the lever *H* composed of two bars carrying between them the sheave *d*, the two cams *G*, *G* bearing on said lever respectively at opposite sides of the sheave, substantially as described and shown. 8th. The combination, with the lever *H*, of the hook *r* and latch *l*, substantially as and for the purpose shown and described. 9th. In combination with the rope-shaft *a* and shaft *a* geared to transmit motion to the shaft *a*, the pinion *e* and the worm *e* pivoted to an oscillatory bearing and adapted to be thrown in and out of connection with the said pinion substantially as and for the purpose set forth.

### No. 20,898. Steam Engine. (*Machine à Vapeur.*)

Leon B. Carriaburn, New York, N.Y., U.S., 17th January, 1885: 5 years.

**Claim.**—1st. The combination with the steam cylinder and piston, of the valve *F*, the valve moving-pistons *G*, *G*, the cylinders for the same, the ports 4, 5, 6 and 7 leading from the steam chest to the cylinder *A*, and the ports 8 and 10 leading from the cylinder *A* to the cylinder *H*, *H*, respectively, and the ports 9 and 11 between the ports 5 and 6 and cylinders *H*, *H*, respectively, substantially as set forth. 2nd. The combination, with the steam valve and two separate and independent valve-moving pistons, of two steam ports and two exhaust ports extending from the valve seat to the main cylinder and an exhaust outlet, the parts being arranged substantially as set forth, so that the steam piston is cushioned at the end of each stroke and the steam ports open into the cushioning spaces of the steam-cylinder, and the live steam is admitted by the valve directly into the cushion to move the piston, substantially as specified. 3rd. The combination, with the valve and the valve-moving pistons and rods, of india rubber or other yielding material between the valve and the piston rods, substantially as set forth. 4th. The combination, with the valve, the valve-moving pistons and rods, of the latches, constructed substantially as set forth, to retain the valve when moved and to be unlatched by the piston rod as it commences to move the valve, substantially as set forth. 5th. The combination, with the valve, of the valve-moving pistons, piston rods and cylinders and the respective ports between the steam chest, the engine cylinder and the cylinders for the valve-moving pistons and the ports 20, 21, substantially as and for the purposes set forth. 6th. The steam cylinder *A* having the ports and tubular valve chamber *T* in the lower part of the same, and the removable caps 25, at the ends of such chamber, in combination with the separate valves 26 introduced from opposite ends into such valve chamber, substantially as specified. 7th. The combination, with the steam engine cylinder, of a chamber *v* and the channel around the cylinder connecting with the exhaust port for the discharge of the water of condensation, substantially as and for the purposes set forth. 8th. The combination, with a steam valve having one or more small passages, of a valve seat with one or more openings into the steam cylinder and closed by said valve except when the valve is in a central position, in order to communicate the pressure from the steam chest to the steam enclosed in the cylinder when the valve is on its centre, so the steam will act upon the valve-moving devices and complete the movement of the valve, substantially as set forth. 9th. In a direct acting steam engine, a valve and one or more openings controlled by the valve and acting when the valve is on its dead centre, to admit more steam to the valve-moving device for completing the movement, substantially as specified. 10th. The combination, with the steam cylinder and piston and the valve, of the valve moving pistons, the cylinders for the same and two ports near each end of the steam cylinder, and branch ports to the respective valve moving cylinders at each side of the pistons, substantially as set forth. 11th. The combination, with the valve and its valve moving pistons, of the steam cylinder and two ports at each end with branch ports to the valve moving cylinder, and pistons, substantially as set forth, whereby the steam piston near each end of its stroke closes one of the ports and compresses the exhaust steam, and causes the same to actuate the valve moving pistons, substantially as set forth. 12th. In combination with the steam piston, the valve moving pistons and valve, a valve seat with the main steam ports slightly different in length from the valve, so that steam cannot be entirely excluded from the ports, and branch ports from the main ports to the valve moving cylinders and pistons, substantially as set forth. 13th. The branch ports 39 and valves 25 therein, opening towards and in combination with the valve moving cylinders, and pistons and valve, and the ports 4, 5, 6, 7, and branch ports 8, 9, 10, 11, substantially as set forth. 14th. In a steam engine having valve moving pistons and ports between the steam cylinder and the cylinders, of the valve moving pistons, valves in two of such ports opening towards such valve moving pistons, substantially as set forth. 15th. The combination, with a piston and steam cylinder, of a valve, two steam ports passing from the valve seat to each end of the steam cylinder, and valve moving pistons cylinders for the same and ports, substantially as specified. 16th. The combination, with the piston and steam cylinder, of a valve having the notches 30 or their equivalents, two steam ports passing from the valve seat to each end of the steam cylinder, and valve moving pistons, cylinders for the same, and ports, substantially as specified. 17th. The combination, with a steam valve *F*, of the pistons *G*, *G*, *I*, piston rods, cylinders *A*, *H*, ports 4, 7, 10, 8, 11, 9, substantially as set forth, whereby the pistons are moved in both directions by the action of the steam, and when moving one way give motion to the valve, and when moving the other way allow the valve to remain stationary, as specified. 18th. The combination, with a steam valve, of two small separate and independent steam pistons having their rods projecting inside of the steam chest and acting alternately upon the valve, each piston and rod working independently of the other and moving the valve and then returning to its normal position, substantially as specified.

### No. 20,899. Button Hole Stitching Machine.

(*Machine à Faire les Boutonnieres*)

Daniel W. G. Humphrey, Chelsea, Mass., U. S., 17th January, 1885: 5 years.

**Claim.**—1st. In a button-hole stitching machine, a slotted work-plate, a cloth holding and feeding clamp, and a feed-wheel having a double feeding groove, a pivoted driver and two concentric sets of teeth, the outer set forming a complete circle and the inner set an arc of a circle only, combined with a recessed hub around which said feed wheel may rotate, and mechanism for imparting an intermittent rotary motion to said feed wheel, substantially as described. 2nd. A slotted work-plate, a cloth holding and feeding clamp and a feed-wheel having a feeding groove, and two concentric sets of teeth, as described, combined with two driving pinions of unequal diameters mounted on a common axis, the smaller pinion being connected with the larger pinion but adapted to rotate independently thereof in one direction, and a driving mechanism constructed to operate the larger pinion directly and the smaller pinion indirectly through its connection with the larger pinion, substantially as described. 3rd. A slotted work-plate and a cloth holding and feeding clamp, combined with a feed wheel adapted to operate said clamp, said feed wheel being pro-