

No. 28,800. Box. (Boîte.)

Charles W. Elliott, Boston, Fred A. Whitney, Locominster, and Leonard F. Lawrence, Revere, Mass., U. S., 4th April, 1888; 5 years.

Claim.—In a box, the flap *b* and side *a*, whose line of junction *l* is reentrant, substantially as and for the purpose specified.

No. 28,801. Machine for Making Metal Timber Hangers, etc. (Machine à faire les moises, etc., métalliques.)

Jacob Russell, George M. Ball, Brooklyn, Henry W. Redfield and John Cooper, New York, N.Y., U.S., 4th April, 1888; 5 years.

Claim.—1st. The combination of a table *C*, a die *B* around which the bar is bent, distinct from said table, normally in place thereon during the bending of the bar, and movable bodily out of the way of the bar when the bending is completed, mechanism for so moving the die, bending devices for bending the bar around said die, and bending devices for bending the bar under the edge of the table, substantially as specified, whereby the finished article may be removed, by drawing it toward the edge of the table without encountering the die. 2nd. The combination of a stationary table *C*, a die *B* normally resting thereon, and bending rollers or devices for bending the bar around said die, and table with mechanism for lifting said die clear from said table upon the completion of the bending operations, substantially as set forth. 3rd. The combination, with the table *C* and die *B*, of bending rollers or devices *E*, adapted to move back and forth along the opposite sides of the die, and mechanism for moving them first fully forward, and then part way back, holding them stationary for a time, and finally moving them back to their original position, substantially as set forth. 4th. The combination, with table *C* and bending rollers *E*, of the die *B* adapted to be lifted from the table and having a projection *p*, which engages a shoulder on the table, whereby the forward strain against the die, during the operation of bending by the rollers *E*, is transferred to the table, substantially as set forth. 5th. The combination, with table *C* and die *B*, of bending rollers or devices *E*, adapted to move back and forth along the sides of the die, with mechanism for so moving them and for holding them at rest in position to hold the bar while it is being twisted, and twisting levers *F*, adapted to turn down laterally upon the table, substantially as set forth. 6th. The combination, with table *C* and die *B*, adapted to be lifted from the table, of twisting levers *F*, *F* pivoted to the opposite sides of the die and adapted to turn down against the table and to be lifted with the die, substantially as set forth. 7th. The combination, with table *C* and die *B*, the latter having recesses *c*, *c*, in its sides, of twisting levers *F*, *F* pivoted to turn outwardly down against the table, and arranged to stand in said recesses when turned vertically, with their lateral working faces flush with the sides of the die, substantially as set forth. 8th. The combination of the *B* formed with recesses *c*, *c*, in its opposite sides, and half pivots *h*, *h*, with the twisting levers *F*, *F*, adapted to enter said recesses and formed with half eyes or sockets *h*, *h*, engaging said half pivots, substantially as set forth. 9th. The combination, with table *C* and die *B*, of twisting levers *F*, *F*, each pivoted on an axis in the plane of the side of the die, and at a height above the surface of the table equal to the thickness of the bar to be operated upon, substantially as set forth. 10th. The combination, with table *C* and die *B*, of twisting levers *F*, *F*, each pivoted on an axis in the plane of the side of the die, at a height above the table equal to the thickness of the bar to be operated upon, and each formed with a projection *f* at a distance from the pivotal axis equal to the width of said bar, substantially as set forth. 11th. The combination, with the die *B*, table *C* and twisting levers *F*, *F*, of projections from the table adapted to engage the bottom edge of the bar and hold it against the die during the twisting operation, substantially as set forth. 12th. The combination, with the die *B*, table *C* and twisting levers *F*, *F*, of catches or pawls *g*, *g*, projecting from the table oblique on one side, to enable the bar to pass over them while being bent against the die, and abrupt on the other side, to resist the outward movement of the bar while being twisted, substantially as set forth. 13th. The combination, with the die *B*, table *C* and twisting levers *F*, *F*, of catches or pawls *g*, *g*, projecting through openings in the table in position to hold the bottom edge of the bar against the die during the twisting operation, and adapted to move up and down, and a spring acting to press the catches up, substantially as set forth. 14th. The combination, with the die *B*, table *C* and twisting levers *F*, *F*, of spring plates *g*, *g*, arranged in recesses in the table with their ends turned up to form catches *g*, *g* and plates *g*, *g*, to cover said recesses, substantially as set forth. 15th. The combination, with the table *C* and die *B*, of bending rollers *E*, *E*, moving back and forth along the sides of the die, twisting levers *F*, *F*, and bending roller *H*, moving vertically past the edge of the table and adapted to turn down the overhanging ends of the bent bar, substantially as set forth. 16th. The combination of the table *C*, die *B*, bending rollers *E*, *E*, twisting levers *F*, *F*, bending roller *H*, moving in a vertical plane past the front of the table and adapted to turn down the overhanging ends of the bent bar, and the bending roller or rollers *I*, adapted to turn under the downward projecting ends of the bar, substantially as set forth. 17th. The combination of the table *C*, the die *B*, the bending rollers *E*, *E*, moving forward and backward along the sides of the die, the twisting levers *F*, *F*, adapted to turn down against the table, the bending roller *H* moving up and down past the front of the table, the bending rollers *I* moving backwardly beneath the edge of the table, and suitable mechanism for driving the several moving parts in succession and for causing each, after it has performed its work, to remain stationary or nearly so, and hold the bar until the next successive part engages it, substantially as set forth. 18th. The combination, with the table *C* and die *B*, of bending rollers *E*, *E*, twisting levers *F*, *F*, bending roller *H*, bending rollers *I*, a driving shaft, suitable intermediate mechanism for imparting motion to the several moving parts, and an automatic clutch through which the machine is driven, adapted when engaged to drive the machine until the several parts have executed each one complete movement and thereby formed one timber hanger, and thereupon to disengage itself

and stop the machine, substantially as set forth. 19th. The combination, with the table *C* and die *B*, and the bending or forming tools or devices *E*, *E*, *F*, *F*, *H* and *I*, of the mechanism for operating said devices consisting of shafts *Q*, *Q*, *P*, *P*, *R*, and *J*, geared together and revolving at uniform speed, and connected respectively to, and imparting movement to the said forming tools or devices, substantially as set forth. 20th. The combination, with the die *B*, table *C* and bending rollers *E*, *E*, of sliding frame *T* carrying said rollers, rotating shaft *Q*, and a cam *U* on said shaft, connected with said frame and constructed and adapted to push the frame forward a full stroke, then permit it to move back a half-stroke, hold it in such position for a time, and then permit it to complete its back-stroke all in one revolution of the cam, substantially as set forth. 21st. The combination, with the die *B*, table *C* and bending rollers *E*, *E*, of a sliding frame *T* carrying said rollers, a rotary shaft *Q*, a cam *U* on said shaft formed with a groove *l*, a pin *m* engaging said groove, and a connecting rod *m* joined to said frame at one end, and carrying said pin at the other, and means, such as a spring or weight, for imparting to the frame *T* a rearward movement when released, substantially as set forth. 22nd. The combination, with the die *B*, table *C* and bending rollers *E*, *E*, of a sliding frame *T* carrying said rollers, a shaft *Q*, a cam *U* on said shaft formed with a radial slot *l*, having lateral notch *l* at the centre of the cam, and notch *l* at the periphery thereof, a pin *m* entering said groove, a connecting rod *m* joined to said frame at one end, and carrying said pin at the other, whereby, on the rotation of said cam, the notch *l* engages said pin and carries it forward a half-revolution until the pin drops out and slides back through the groove to the notch *l*, where it rests during the remaining half-revolution, when it again drops out and slides back to the notch *l*, and means, such as a weight or spring, for imparting to the slide a tendency to move rearwardly, substantially as set forth. 23rd. The combination, with the die *B* and table *C*, of bending rollers *E*, *E*, and mechanism for driving them, clamping-plunger *D* adapted to hold the work against the rear end of the die, while the rollers *E*, *E* operate, sliding frame *D*, and revolving cam *U*, having peripheral cam-face *n*, for acting against said slide, substantially as set forth. 24th. The combination, with table *C*, die *B* and twisting levers *F*, *F*, of shaft *P*, and cam *U*, *U*, on said shaft, having each a spiral working-face engaging the ends of the levers *F*, and, as the cam revolves, pressing the latter down, substantially as set forth. 25th. The combination, with the table *C*, die *B* and twisting levers *F*, *F*, of shaft *P* and cam *U*, *U*, on said shaft, each having a spiral working-face *n* engaging the ends of the levers *F*, and, as the cam revolves, pressing the latter down, and a concentric face *n* for holding levers down, substantially as set forth. 26th. The combination, with table *C*, die *B* and twisting levers *F*, *F*, of means such as a weight or spring, for imparting to said levers a tendency to assume the vertical position, a shaft *P*, and cam *U*, *U*, on said shaft, for pressing said levers down, whereby, when said cam has passed, the levers *F* fly up of themselves, substantially as set forth. 27th. The combination, with table *C*, of die *B*, vertical slide *B* attached to said die and having projection *e*, and shaft *P* having cam-projection *r*, whereby, as the shaft turns, the projection *r* takes under, lifts and releases the projection *e*, and thereby lifts and drops the slide *B* and die *B*, substantially as set forth. 28th. The combination, with table *C* and roller *H*, of vertical sliding frame *H*, shaft *Q*, cam *V* on said shaft, for lifting said frame, and cam or cams *V* on said shaft for pressing down said frame, substantially as set forth. 29th. The combination, with table *C* and roller *H*, of frame *H* made in section sliding upon each other, in order to set the roller *H* higher or lower, and a filling piece *r* for the direct transmission of the strain, with cam mechanism for moving said frame up and down, substantially as set forth. 30th. The combination, with table *C* and roller *H*, of rollers *I* and shaft *J* having radial arms *i*, *i*, carrying said roller or rollers, substantially as set forth. 31st. The combination, with table *C*, removable thickening plate *C*, for altering the thickness of the table and vertically moving roller *H*, of rollers *I*, shaft *J* having arms *i*, *i*, carrying said rollers, and bearings *l* *l*, for said shaft, adjustable vertically to adapt the rollers *I* to alterations in the thickness of the table, substantially as set forth. 32nd. The combination, with table *C*, means for varying its thickness, vertically moving roller *H*, rollers *I*, shaft *J* having arms *i*, *i*, carrying said rollers, said shaft being vertically adjustable to adapt the rollers *I* to alterations in the thickness of the table, gear *h* on said shaft, driving gear *h* from which said gear is driven, and idler pinion *j* between said wheels, with means for adjusting said pinion in different positions to adapt it to the changes in position of the gear *h*, substantially as set forth.

No. 28,802. Apparatus for Generating Illuminating and Heating Gas. (Appareil à gaz d'éclairage et de chauffage.)

William T. Stewart, Sullivan Johnson, J. F. Johnson, Edwin F. Earle and Samuel U. Trent, Pittsburg, Penn., U. S., 4th April, 1888; 5 years.

Claim.—A gas generating apparatus consisting in the combination of a furnace, a gas generating retort and an injector connected therewith, a steam superheating chamber provided with a series of return pipes, a steam pipe connecting the discharge end of said return pipes with the injector, an oil supply pipe connected with said injector, and an air heating chamber also provided with a series of return pipes, the discharge end of said air pipes being connected by pipe with the gas generating retort, substantially as described and for the purposes set forth.

No. 28,803. Mechanical Movement. (Embrayage à friction.)

Eckley B. Cox, (co-inventor with Samuel Salmon,) Drifton, Penn., U. S., 4th April, 1888; 5 years.

Claim.—1st. As an improvement in mechanical movements, two relatively movable parts which have parallel inner faces, in combination with a double cone that is placed between, and has rolling contact with, the inner faces of said parts, and is adapted to furnish a rolling supporting bearing and support for the upper part, substantially as and for the purpose specified. 2nd. As an improvement in