

and adapted to operate substantially as set forth. 16th. An apparatus for disintegrating fibres, consisting of a digester, a perforated pipe, or pipes, passing through the same, steam pipes connected to both ends of said perforated pipe, a circulating pump connected to one end of said perforated pipe, and the delivery pipe from said pump connected to the opposite end of said perforated pipe, with suitable valves for said pipes, combined and adapted to operate substantially as set forth. 17th. An apparatus for disintegrating fibres, consisting of a digester, a perforated pipe, or pipes, passing through the same, steam, water and chemical pipes connected to said perforated pipe, a screen in the bottom of said digester, a drainage pipe leading from beneath said screen and connecting with said pipes, and a circulating pump connected to said drainage pipes, and to one of said perforated pipes, and its discharge pipe extending to and connected with the opposite end of said perforated pipe, all combined together and with suitable valves, and adapted to operate substantially as set forth. 18th. The combination of a digester, a perforated pipe, or pipes, entering it, steam, water and chemical pipes connected to said perforated pipe, a vacuum pipe leading from the digester, a pump in connection with said pipe, a branch pipe connecting said perforated pipe with said vacuum pipe, and suitable valves in the respective pipes arranged to operate substantially as set forth. 19th. The combination, with a digester, of two or more perforated pipes extending through it, valved cross-pipes connected to them at their opposite ends, and a circulating pump with its suction connected with one of said cross-pipes, and its discharge connected to the other, substantially as set forth, whereby the said pump may draw liquid from the digester through one of said perforated pipes, and return it thereto through another. 20th. An apparatus for disintegrating fibres, consisting of a digester, a valved vacuum pipe leading from the upper part thereof, and an exhausting device connected to said pipe and adapted to produce a partial vacuum in said digester, and a steam pipe entering the bottom of said digester, combined and adapted to operate substantially as set forth. 21st. The combination, of a digester, a vacuum chamber, a suction pump, an outlet passage from the digester to said vacuum chamber, a valve in said passage, a suction pipe extending from said vacuum chamber to said pump, and a suction pipe extending from the digester and communicating with said pump, substantially as set forth. 22nd. The combination of a digester, an outlet passage therefrom, a grit separator, and a force pump, whereby the contents discharged from the digester pass through the grit separator before being drawn into said pump, substantially as set forth. 23rd. The combination of a digester, a vacuum chamber, an outlet passage from the digester entering said chamber, a valve in said passage, a force pump adapted to draw the liquid from the bottom of said chamber, and a suction pump adapted to draw the air from the upper part of said chamber, and thereby to maintain the vacuum therein, substantially as set forth. 24th. The combination of a digester, a vacuum chamber, a valved outlet passage from the digester to said chamber, a suction pump connected to said chamber, and adapted to maintain the vacuum therein, an outlet for liquid from the bottom of said chamber, a grit separator connected to said outlet, and a force-pump with its suction connected to the outlet of said separator, and adapted to draw the liquid therefrom against the suction in the vacuum chamber, substantially as set forth. 25th. A digester constructed with double walls, forming a water jacket between, in combination with a pipe extending from the top to the bottom of said jacket, and a pump for causing a circulation in said pipe and jacket, substantially as set forth. 26th. The combination, with a digester, of a horizontal shaft in its lower portion, arms fixed on said shaft, and suitable means for rotating said shaft, whereby the contents of the digester may be agitated, substantially as set forth. 27th. The combination, with a digester having a screen in its bottom, of an agitator for the contents thereof, consisting of a shaft in said digester, arms on said shaft arranged to play over and stir the contents close to the said screen, and means for rotating said shaft, substantially as set forth.

### No. 30,115. Process and Apparatus for Manufacturing Paper Pulp. (*Procédé et appareil de fabrication de la pâte à papier.*)

Henry Blackman, New York, N. Y. U. S., 6th November, 1888; 5 years.

*Claim.*—1st. The improvement in art of making paper pulp, which consists in, first disintegrating fibrous material and subsequently pulping the disintegrated fibres by suspending them in a liquid vehicle, and agitating the liquid by forcing it through a passage containing obstructions or deflections, thereby causing a relative movement of the fibres, whereby the latter are gently worked apart and reduced to a condition of pulpiness. 2nd. The improvement in the art of making paper pulp, which consists in, first disintegrating fibrous material by boiling with a solvent, separating the disintegrated fibres from the solvent and subsequently pulping them by suspending them in a liquid vehicle, and agitating the liquid by forcing it through a passage containing obstructions, thereby causing a relative movement of the fibres, whereby the latter are gently worked apart and reduced to a condition of pulpiness. 3rd. The improvement in the art of making paper pulp, which consists in passing disintegrated fibres with liquid through an extended passage containing corrugated plates, whereby it is sub-divided into sinuous spaces, through which the liquid flows, carrying the fibres against the projecting corrugations. 4th. The improvement in the art of making paper pulp, which consists in first disintegrating fibrous material, and subsequently pulping the disintegrated fibres by suspending them in a liquid vehicle, passing the fibres and liquid through a closed chamber, and agitating the liquid therein by agitating devices driven by power, thereby causing a relative movement of the fibres, whereby the latter are gently worked apart. 5th. The improvement in the art of making paper pulp, which consists in forcing disintegrated fibres through a closed chamber, and agitating them therein by reciprocating corrugated plate driven by power, between which plates the liquid is forced to flow. 6th. The improvement in the art of making paper pulp, which consists in forcing the fibres with liquid through an extended passage, wherein they are first forcibly agitated by means of moving agitating devices driven by power, and subsequently

gently agitated by passing stationary obstructions contained in said passage. 7th. The improvement in the art of making paper pulp, which consists in forcing the fibres with liquid through a passage or chamber, and over moving brushes which act to scrub the fibres. 8th. The improvement in the art of making paper pulp, which consists in forcing the fibres with liquid through a passage or chamber and between opposite brushes, which are moved relatively to one another and act to scrub the fibres. 9th. The improvement in the art of making paper pulp, which consists in forcing the fibres with liquid through a passage, clothed internally with brushes and scrubbing them in their passage therethrough by brushes filling said passage and driven by power. 10th. The improvement in the art of making paper pulp, which consists in forcing the fibres with liquid through a passage, wherein they are forcibly agitated by agitating devices driven by power, and then through a passage wherein they are scrubbed by moving brushes. 11th. The improvement in the art of making paper pulp, which consists in forcing the fibres with liquid through a passage wherein they are scrubbed by moving brushes, and subsequently forcing them through an agitating passage wherein they are gently agitated by contact with obstructions. 12th. The improvement in the art of making paper pulp, which consists in forcing disintegrated fibres mixed with a liquid vehicle through an agitating passage or chamber, whereby the fibres are cleaned, then draining the liquid from the fibres, adding clean liquid and forcing again through an agitating passage or chamber. 13th. The improvement in the art of making paper pulp, which consists in cleansing the fibres by forcing them with liquid through a scrubber draining off the liquid, supplying fresh liquid, and forcing through an agitating passage. 14th. The improvement in the art of making paper pulp, which consists in cleansing the fibres by mechanical agitation with liquid, and by scrubbing, then draining off the liquid, supplying fresh liquid, and forcing through an agitating passage. 15th. The improvement in the art of making paper pulp, which consists in mixing disintegrated fibres with a bleaching liquor, forcing the fibres and liquid through a passage containing agitating obstructions, whereby the liquor is brought into intimate contact with the fibres, then draining off the bleaching liquor, adding fresh water, and forcing the fibres and water through a second agitating passage, whereby the fibres are rinsed and freed from the residue of bleaching liquor. 16th. The improved apparatus for manufacturing paper pulp, consisting of the combination of a digesting vessel, a pump, an agitator consisting of a passage or chamber containing agitating obstructions or deflections, and pipes connecting the respective parts, whereby the fibres disintegrated in said digester may be forced by said pump through said agitator. 17th. The improved apparatus for manufacturing paper pulp, consisting of the combination of a digesting vessel, a pump, a pipe for conducting the contents of the digester to said pump, a water pipe communicating therewith, whereby the fibres discharged from the digester may be mixed with water and washed to said pump, and an agitator in communication with said pump, and consisting of an extended passage containing agitating obstructions or deflections, whereby the fibres and water may be forced by said pump through said agitator. 18th. A pulp agitator, consisting of the combination of a casing with alternate partitions therein, forming a back-and-forth passage for the pulp, and with agitating obstructions in said passage, adapted to cause an eddying of a stream of liquid forced therethrough. 19th. A pulp agitator, consisting of the combination of a casing with alternate partitions therein, forming a deflected passage for the pulp, and with agitating obstructions, consisting of corrugated plates arranged in said passage and subdividing it into sinuous spaces. 20th. A pulp agitator, consisting of the combination of a casing, forming a passage for the pulp, corrugated plates in said casing, the alternate plates being movable relatively to the others, and mechanism for imparting motion to said alternate plates. 21st. A pulp agitator, consisting of the combination of a casing, forming a passage for the pulp, corrugated plates fixed longitudinally in said passage, with their corrugations extending transversely thereof, movable corrugated plates alternated with the fixed plates, a reciprocating frame connected to said movable plates and extending outside the casing, and a rotary shaft having a crank connected to and reciprocating said frame. 22nd. The improved apparatus for manufacturing paper pulp, consisting of the combination of a pump and a scrubber, the latter consisting of a casing with a passage through it for the pulp, and a moving brush in said casing adapted to scrub the pulp in its passage through said casing. 23rd. A pulp scrubber, consisting of the combination of a casing forming a passage for the pulp, stationary brushes clothing a passage, and a movable brush arranged in said passage, whereby the pulp in flowing through passes between said stationary and movable brushes. 24th. A pulp scrubber, consisting of the combination of a casing, a cylindrical passage through said casing, brushes lining said passage, and a cylindrical brush arranged to rotate in said passage. 25th. The improved apparatus for manufacturing paper pulp, consisting of the combination of a pump, an agitator and a scrubber connected together, substantially as set forth. 26th. The improved apparatus for manufacturing paper pulp, consisting of the combination of a pump, an agitator connected to said pump, and a draining device connected with the outlet of the agitator and adapted to free the pulp issuing therefrom of its liquid vehicle.

### No. 30,116. Saw Swaging Machine.

(*Machine à étiapper les scies.*)

Milo Coxel, Chicago, Ill., U. S., 6th November, 1888; 5 years.

*Claim.*—1st. In a saw swage, the combination, with the frame, of a head block, a rocking or rolling die inserted in said head, a link connected at the inner end to said die, a connecting rod pivoted to the outer end of said link, an eccentric strap, in which the lower end of the connecting rod is inserted, a cam or crank wheel and a counter-shaft upon which the same is mounted, whereby the required motion is transmitted to the roller die, substantially as and for the purpose set forth. 2nd. In a saw swage, the combination, with the rocking or roller die, provided with a recess in the face of the saw, of a die point seated in said recess, and a set screw for adjustably securing said die point in place, substantially as and for the purpose set forth. 3rd. In a saw swage, the combination, with a head block of a roller