

(No Model.)

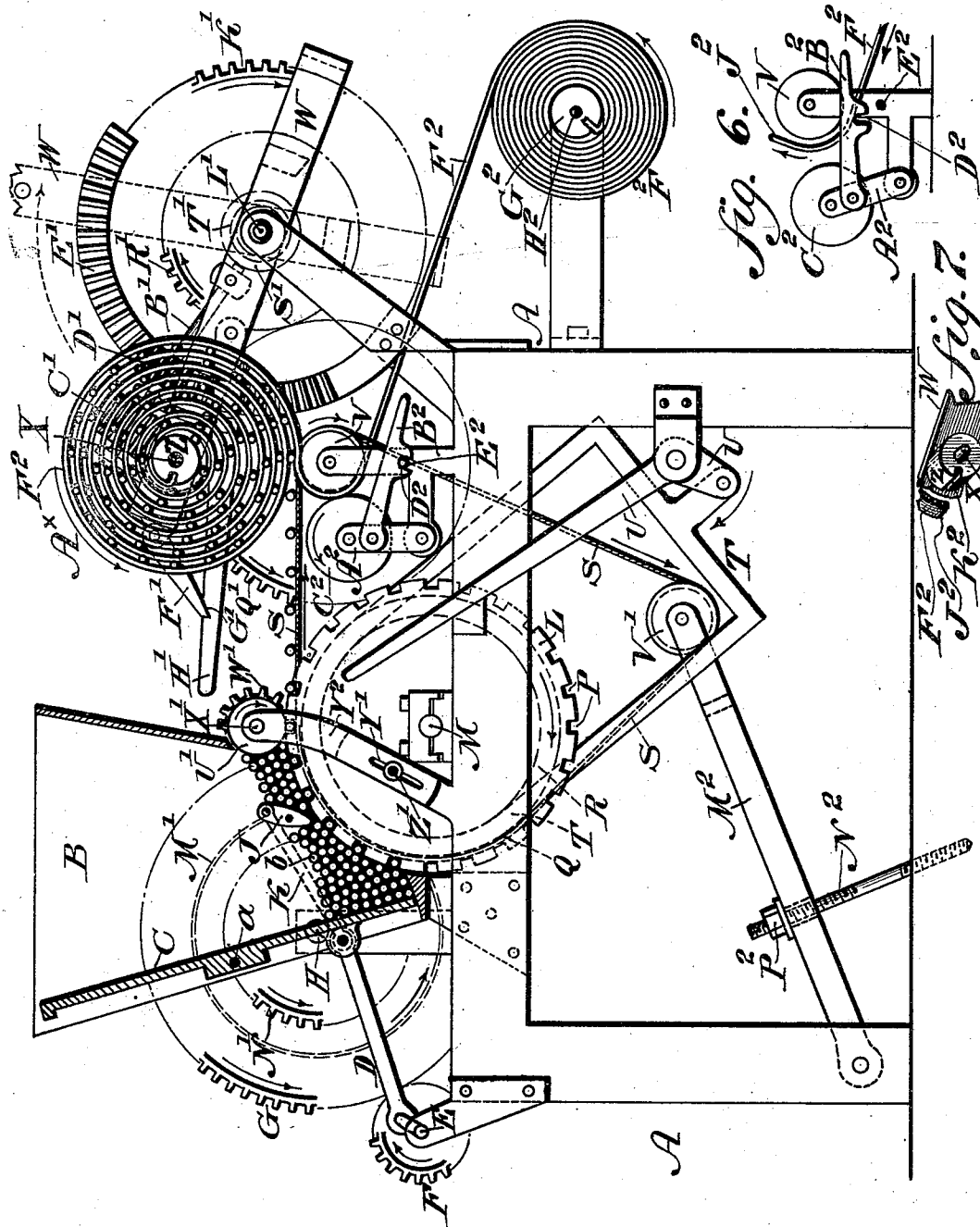
2 Sheets—Sheet 1.

F. SCHAFER.

MACHINE FOR COILING OR WINDING MATCH SPLINTS.

No. 512,061.

Patented Jan. 2, 1894.



WITNESSES:

L. Douville,
C. H. Bagle.

fig. 1.

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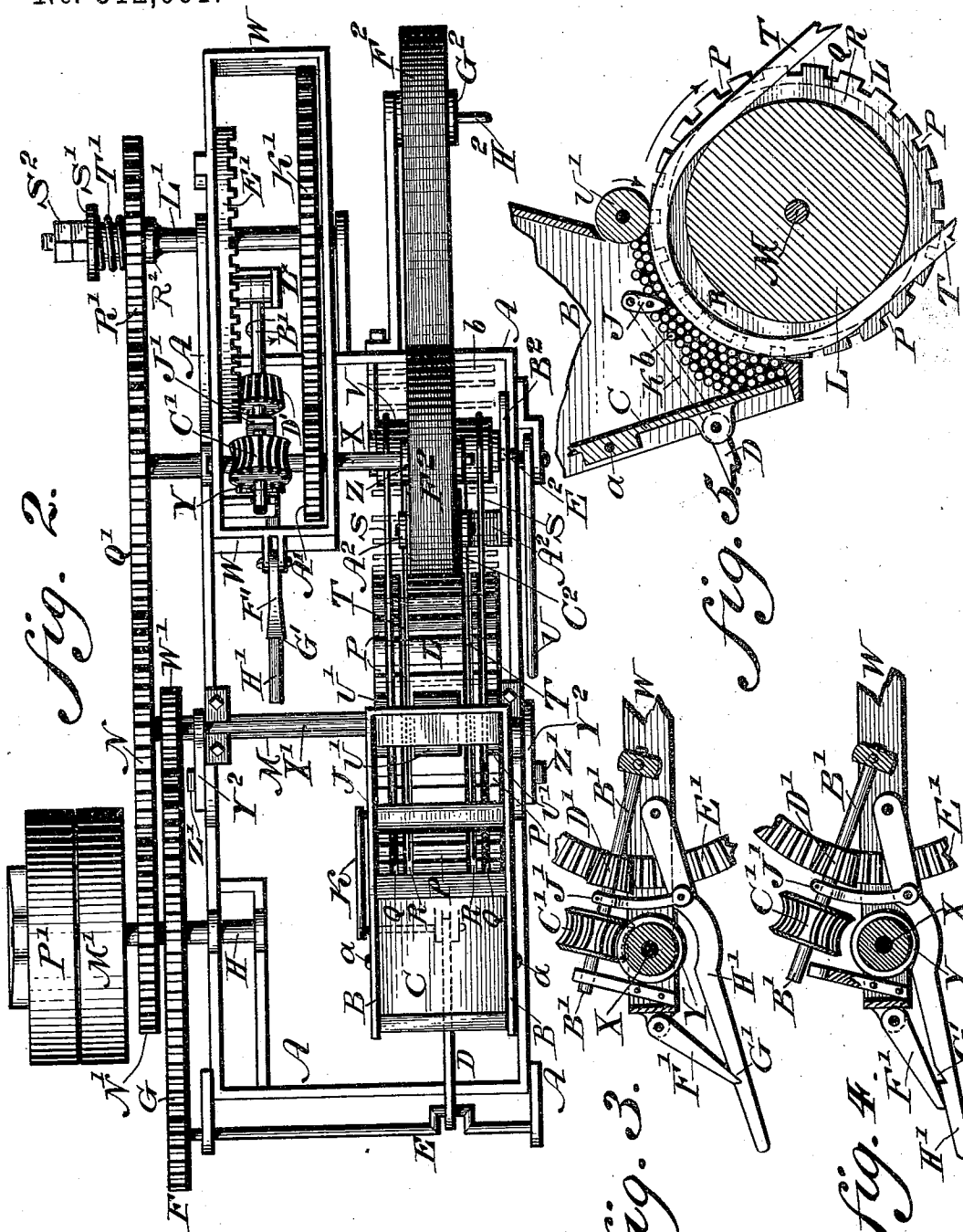
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FRANK SCHAFER, OF PHILADELPHIA, PENNSYLVANIA.

MACHINE FOR COILING OR WINDING MATCH-SPLINTS.

SPECIFICATION forming part of Letters Patent No. 512,061, dated January 2, 1894.

Application filed October 28, 1892. Serial No. 450,304. (No model.)

To all whom it may concern:

Be it known that I, FRANK SCHAFER, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Machines for Coiling or Winding Match-Splints, which improvement is fully set forth in the following specification and accompanying drawings.

My invention relates to improvements in machines for coiling and winding match splints, and consists of the combination of parts as hereinafter set forth.

Figure 1 represents a partial side elevation and partial vertical section of a machine for winding match splints embodying my invention. Fig. 2 represents a plan view of the machine. Fig. 3 represents a view of a detached portion, partly sectional. Fig. 4 represents a view of the parts shown in Fig. 3, but in different positions. Fig. 5 represents a vertical section of a detached portion. Fig. 6 represents a view of a detached portion. Fig. 7 represents a perspective view of a detached portion.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings: A designates the frame of the machine upon which is secured the hopper B, the back C of which is pivoted to the sides of said hopper as at a to permit said back to swing, in order to agitate the splints b placed within said hopper. The back C is connected by a link D, to a crank shaft E, mounted on the frame A, and carrying a gear wheel F, which meshes with a gear wheel G on the driving shaft H.

Within the hopper B is a finger J, see Fig. 2, which is pivoted to the sides of the hopper, and is connected by a link K with the back C of said hopper, said finger when operating, tending to move the splints toward the front of the hopper.

L designates a grooved wheel or drum mounted on the frame A. The shaft M which carries said drum carries also a gear wheel N, which meshes with the gear wheel N' on the shaft H. As will be seen, a portion of said drum L is within the hopper B.

The drum L is provided with grooves P in its periphery said grooves being parallel to the axis of said drum, and it is further pro-

vided with circumferential grooves Q and R, the grooves Q being adapted to receive endless belts or cords S, which convey the splints b from the hopper B toward the coil of splints A^x, and the grooves R receive the frames T, which at certain times move the splints b in the hopper B out of the path of the grooves P in the drum L, so that said drum ceases to be supplied with splints, as shown in Fig. 5. The frame T is pivoted to an elbow lever U, said lever being suitably mounted on the frame A. The belts or cords S pass partly around the drum L, and rollers V and V'. Pivoted to the frame A is a frame W, which carries a shaft X provided with a worm Y, roller Z and gear wheel A'. The frame W has also a rising and falling shaft B' placed at an angle to the shaft X, said shaft B' being provided with a worm wheel C' which engages the worm Y, see Fig. 3, and a bevel gear wheel D' which meshes with a segment E' secured to the frame A. The shafts X and B' are substantially at right angles to each other, and the shaft B' is journaled at one end in a short oscillating shaft or stud L^x mounted in front of the shaft L', and on the inner side of the frame W, and at the other end when lowered, so that the worm wheel C' is meshed with the worm Y, and has a bearing in an arm or attachment of the frame W. Pivoted to the end of the frame W, adjacent to the worm Y, is a pawl F' adapted to engage in a recess G' in a lever H', also pivoted to the frame W. The lever H' is provided with a link J' which is connected to the shaft B', so as to raise and lower said shaft B' and thereby cause the worm wheel C' to either mesh with or be removed from the worm Y, as the case requires.

The gear wheel A', Fig. 2, meshes with a gear wheel K' firmly secured to the shaft L' mounted on the frame A, said shaft L' being the axis of the pivoted frame W.

The shaft H is provided with a fixed pulley M' and a loose pulley P'. The gear wheel N meshes with an idler Q' mounted on the frame A, and said idler meshes with a gear wheel R' loosely mounted on the shaft L'.

Interposed between one side of the gear wheel R' and a head S', which is held by nuts S² on the shaft L', is a spring T' which forces the said wheel R' against a collar or shoul-

dered portion R² of said shaft, thereby transmitting rotary motion from the said wheel to the said shaft, and consequently to the gear wheel K' on the latter.

5 Mounted on the frame A, and partly entering the hopper B are rubber rollers U' which work on the periphery of the drum L, so as to prevent more than one splint leaving at one time the hopper B, by forcing back into said hopper all splints not in the grooves P, when
10 any one of said grooves reaches a point directly beneath the rollers U'. Motion is imparted to said rollers U' by a pinion W', on a shaft X', which carries said rollers. The shaft X' by means of the slot Y' in an arm Y², and screw Z' which passes through said slot into the frame A, may be adjusted relatively to the drum L. This adjustment is made necessary on account of the rubber rollers becoming reduced in diameter by wear.
20 When this is the case, the arm Y' is lowered, carrying with it the rollers U', thereby insuring contact between said drum and the rollers U'. Mounted on the frame A is a swinging frame A² provided with a lever B² and a tension roller C², said lever having a recess D² adapted to engage a pin or stud E² on the frame A, and thus hold the tension roller C² normally against the roller V, so that
25 when the belt F², which retains the splints when wound in a coil, is passed between said rollers, it will not slip.

The operation is as follows: Within the hopper B are placed the splints b. A roller G² around which is wound the belt F² is slipped on a pin H² on the frame A. The handle B² is raised so as to disengage its recess D² from the pin E², and the swinging frame A², and consequently the tension roller C²
35 thereon is swung away from the roller V, so as to increase the space between said rollers in order to permit the free end J² of the belt F² to be freely passed between the same. From this point it is taken to the roller Z, and the end J² inserted in a groove K² in said roller Z. See Figs. 6 and 7. The frame A² is then moved toward the roller V, and the recess D² in the handle B² caused to engage the pin E² and thus hold the tension roller firmly
40 against the belt F² so that slipping of said belt, after the same has passed the rollers V and C², is prevented. The machine is now started, and the back C of the hopper B is caused to vibrate, by means of the crank shaft E and link D. This keeps the splints b in constant motion, and thus causes the same to enter the grooves P in the drum L. The finger J assists the back C in keeping the splints b in motion. The splints in the grooves P remain in the same until they are outside of the hopper B, when they are removed from said grooves by the endless belts or cords S, and conveyed by the same to the roller V. The belt F² which is drawn from the roller
45 G², receives said splints and winds them around the roller Z in the form of a coil A^x, as shown in Fig. 1. As the coil of splints in-

creases, the shaft X being on the pivoted frame W, is caused to rise or move away from the roller V, and the speed of revolution of said coil decreases, owing to its increasing diameter. The speed of revolution of the gear wheel R' is a fixed one, while the speed of the gear wheel K' varies, inasmuch as it is governed by the coil of splints, which as heretofore stated revolves faster or slower according to the diameter of said coil. When the coil of splints is nearly finished, the same will rotate much slower than when the coil was started, and consequently the spring T' permits the gear wheel R' to rotate without imparting an equal speed to the gear wheel K', since it is due only to the friction of the spring T' that the gear wheel R' imparts motion to the gear wheel K', and when there exists a difference in the speed of the gear wheels R' and K' the spring T' will slip, and thus permit each of said wheels to rotate at their respective speed without causing injury to the machine. The gear wheel K' imparts motion to the gear wheel A' and consequently to the shaft X, on which is secured the worm Y, which imparts motion to the shaft B', and consequently to the bevel gear wheel D', which meshes with the segment E'. When the coil of splints is being formed, the bevel gear wheel D' rotates in the direction indicated by the arrow in Fig. 1, thereby raising the free end of the swinging frame W in order to move the shaft X away from the roller V, a distance equal to the increased diameter of the coil of splints, said increase occurring at each revolution of said coil. When there remains on the roller G² an amount of belting equal to about three revolutions of the coil of splints the lever U is operated so as to cause the frame T to raise the splints in the hopper B out of the path of the grooves P in the drum L, as shown in Fig. 5. As the coil of splints continues to rotate, said coil will draw the belting from the roller G², but with no splints between each layer of said belting. This is done to insure a firm coil of splints, and to prevent slipping of the belt in said coil, which would destroy the same. When all the belting on the roller G² has been taken up by the coil hereinbefore described, the loose end of said belting is secured to the coil in any suitable manner, as for instance, by means of a tack or staple. The coil of splints is then removed from the shaft X and is ready to be dipped so as to supply said splints with heads. When the coil hereinbefore described is removed from the shaft X, said shaft is at a considerable distance from the roller V and as it is necessary that said shaft should be close to the roller V when a coil of splints is started, the shaft X requires to be lowered, and in order to accomplish this, the pawl F' is removed from the recess G' and the lever H' raised, as shown in Fig. 4. This movement by means of the link J' lifts the shaft B' and throws the worm wheel C' out of engagement with the worm Y, and permits said worm and

worm wheel to rotate at their respective speed. The revolution of the worm Y accomplishes nothing when the free end of the frame W is being lowered, but takes place simply on account of the gear wheel A' on the shaft X meshing with the gear wheel K' on the shaft L'. When the shaft X has been returned to its starting point, the lever H' is lowered, and the pawl F' engaging the recess G' in the lever H' firmly retains the latter in its lowered position, thereby causing the worm Y and worm wheel C' to again engage each other. The lever U is returned to its normal position as shown in Fig. 1, which permits the splints in the hopper B to enter the grooves P in the drum L. Another roll of belting from which a coil of splints is formed, is placed in the machine as hereinbefore described, and the several parts are in readiness to produce another coil of splints. In order to take up the slack in the cords S, when such occurs, the roller V' is mounted on a swinging arm M², which, owing to the bolt N² and nut P² thereon, may be lowered thereby carrying with it said roller, and thus tightening or taking up the slack in the cords S, or regulating the tension thereof.

The mechanism for automatically adjusting the height of the shaft which carries the splint coil relative to the diameter of the said coil, and described and illustrated in this application, is not broadly claimed herein, *per se*; being described, shown and claimed in an application by me for Letters Patent of even date herewith, bearing Serial No. 450,305.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A machine for coiling or winding match splints having a main frame with a hopper thereon, a rotatable drum, a swinging frame resting in peripheral grooves in said drum for removing splints from transverse grooves therein, a rising and falling frame pivoted on an attachment of the main frame and carrying a shaft for the splint coil, a shaft journaled on the main frame for the coil web, friction rollers between said shafts, and mechanism

connected with said rising and falling frame and the operating mechanism of the drum for raising and lowering said frame relative to the diameter of the splint coil, said parts being combined substantially as described.

2. A machine for coiling or winding match splints, having a main frame, a hopper with an agitating device therein, a rotatable drum having transverse grooves and circumferential grooves in its periphery, a rising and falling frame in a portion of the circumferential grooves of said drum, a swinging frame carrying a splint coil shaft, a main driving shaft with connected mechanism for operating said drum and agitating device, and mechanism substantially as described connected with said drum-operating mechanism and with said coil shaft for adjusting said shaft relative to the diameter of the coil thereon, said parts being combined substantially as described.

3. A machine for coiling or winding match splints, consisting of a main frame, a hopper thereon having a swinging back, an agitating finger in said hopper, pivoted to the sides thereof, a drum entering said hopper and having transverse and circumferential grooves in its periphery, a swinging frame above said main frame having journals thereon, a shaft for the splint coil, a main driving shaft, mechanism substantially as described connected with said shaft for rotating said drum, mechanism substantially as described connected with said drum-operating mechanism and said coil shaft for adjusting the latter relative to the diameter of the coil thereon, tension rollers below said coil shaft, a roller for the coil tape, and a movable frame resting on a portion of the circumferential grooves of the drum, below the transverse grooves thereof, and belts passing around said drum for carrying the splints to the coil tape, said parts being combined substantially as described.

FRANK SCHAFFER.

Witnesses:

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A. P. JENNINGS.