(No Model.) 2 Sheets—Sheet 1.

S. T. KENNAN.

SANDING OR POLISHING MACHINE FOR CARRIAGE SPOKES.

No. 286,707. Patented Oct. 16, 1883.

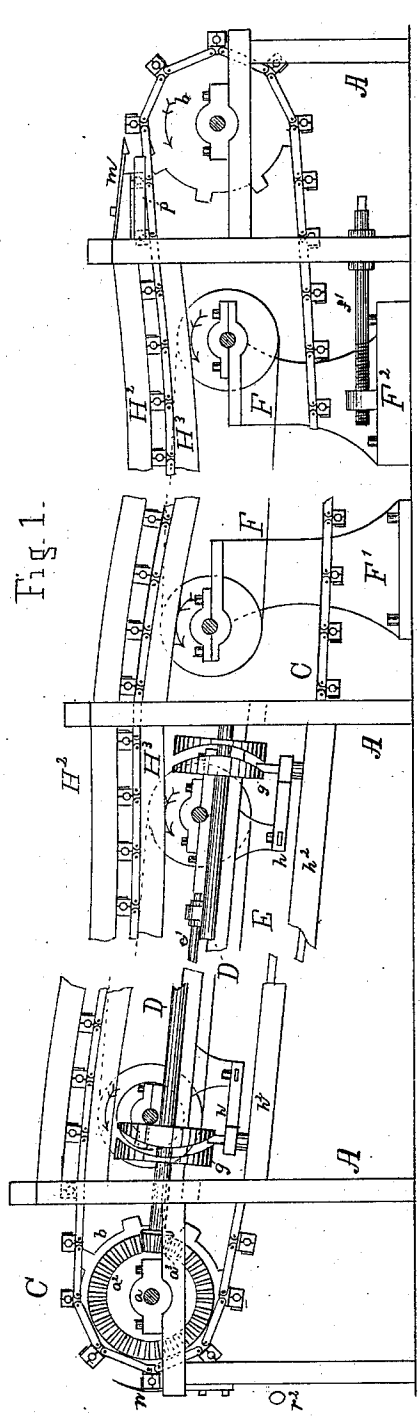


Fig. 1.

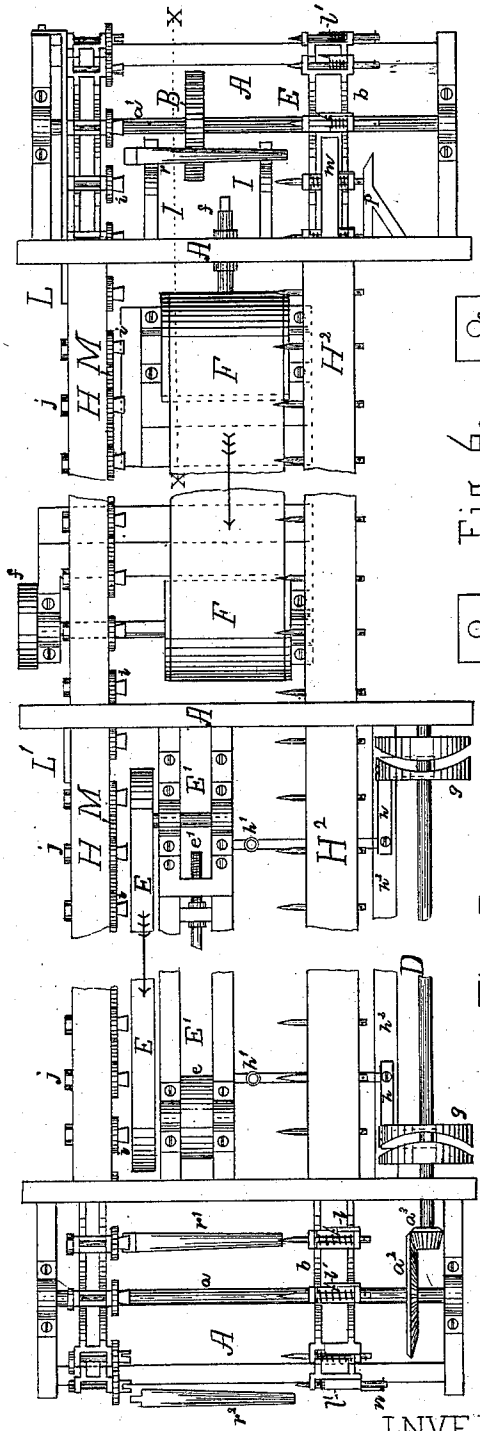


Fig. 2.

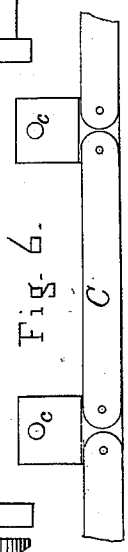


Fig. 6.



Fig. 7.

Witnesses.
Charles E. Foster
John C. Mitchell

INVENTOR.
Sidney T. Kennan
per G. H. Allee & Co.

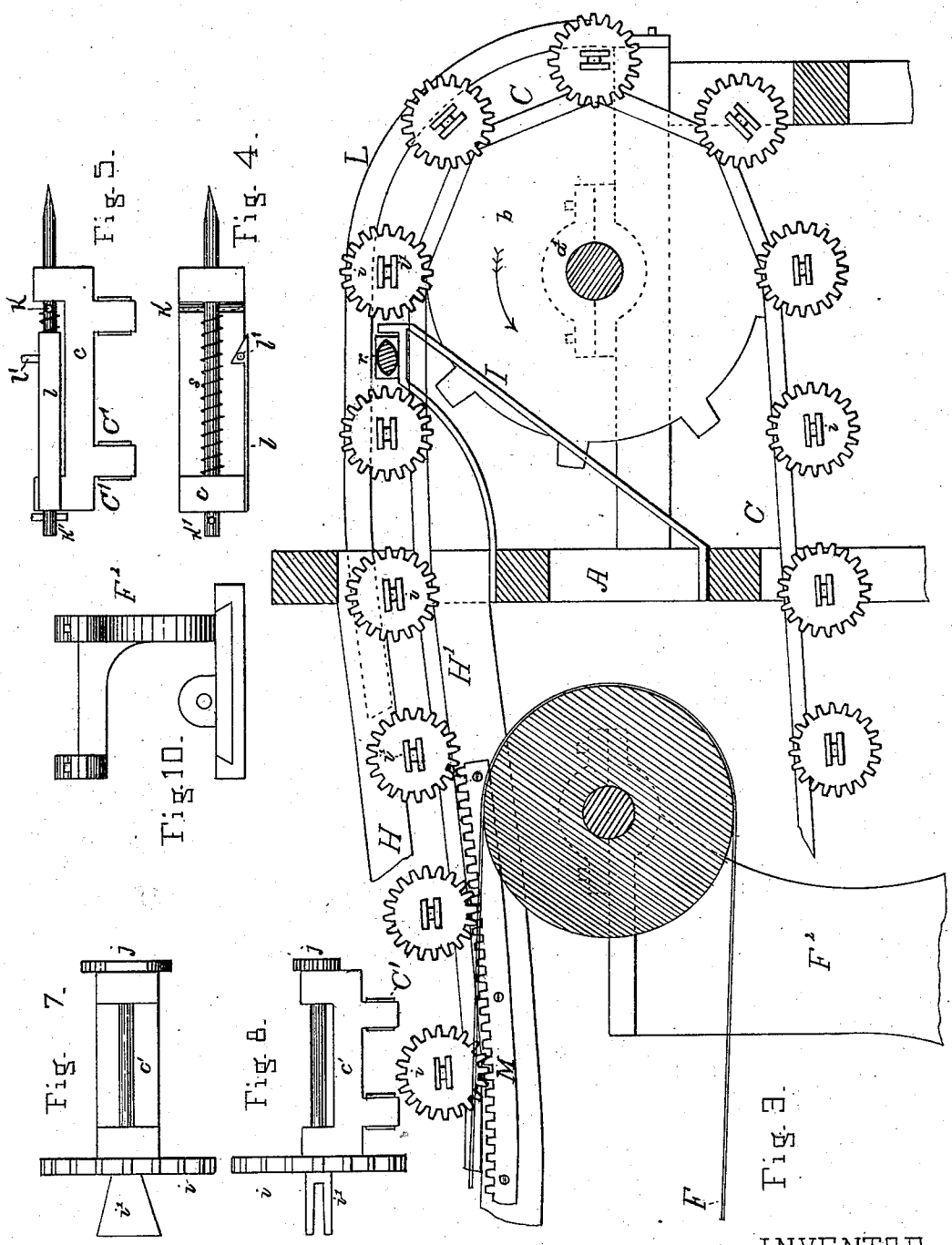
N. PETERS, Photo-Lithographer, Washington, D. C.

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Charles E. Foster
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per G. H. Abbe Atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

SIDNEY T. KENNAN, OF MENASHA, WISCONSIN, ASSIGNOR TO THE WEBSTER MANUFACTURING COMPANY, OF SAME PLACE.

SANDING OR POLISHING MACHINE FOR CARRIAGE-SPOKES.

SPECIFICATION forming part of Letters Patent No. 286,707, dated October 16, 1883.

Application filed August 16, 1883. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY T. KENNAN, a citizen of the United States, residing at Menasha, in the county of Winnebago and State of Wisconsin, have invented certain new and useful Improvements in Sanding or Polishing Machines for Spokes of Carriages, of which the following is a specification.

My invention relates to improvements in machinery for polishing and finishing spokes of wagon and carriage wheels, in which mechanism is employed which automatically grasps the spokes and presents them for the polishing action of sanding-belts, and which, while so presented to the belts, causes the spokes to revolve with a uniform motion coactively with a reciprocating motion in a direction parallel with the spokes of one or more of said sanding-belts, whereby the spokes are brought in contact with said belt only at such times and in such positions as will, while thoroughly polishing it, leave its corners, near the tenon, full and not unduly worn off by the cutting action of the aforesaid belts.

The object of my invention is to furnish a sanding-machine for spokes or other articles in which they may be polished uniformly and expeditiously without excessive manual labor, thereby producing a superior article at a less cost than by the present imperfect machines. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the sanding-machine, a part of each sanding-belt and the endless chain corresponding thereto not being represented, its omission being indicated by the broken ends of the several parts. Fig. 2 is a plan of the same, the same omission pertaining to it. Fig. 3 is a vertical section upon the line *x x* of Fig. 2, drawn upon an enlarged scale. Figs. 4 and 5 are respectively a plan and side elevation of a component of the chain upon which the round or small end of the spoke is carried, which, with the following four figures, is drawn upon a scale twice the length of Fig. 3. Fig. 6 is an end view of the same pieces and the links connecting them and forming one of the endless chain-carriers. Figs. 7 and 8 are respectively a plan and side elevation of pieces forming the chain-carrier, which retains the flat end or tenon of the spoke. Fig. 9 is a plan of a plate secured to the end of the shaft carrying the gear-wheel in Figs. 7 and 8, and which governs the position in which the spoke-socket is presented for the reception of the spoke, and also that in which the spoke is presented to the sanding-belt, as will be further explained. Fig. 10 is an elevation of one of the standards, in which the pulley carrying the principal sanding-belt is supported, and having a gibbed base with screw for adjusting the tension of said belt.

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

A represents the frame of the machine, resting upon the floor, to which the mechanism to be described is attached.

a a' are shafts, upon which are secured sprocket-wheels *b*.

C is an endless chain, carried upon the sprocket-wheels *b*, and is composed of the castings *c c'* and links C', riveted loosely to the same. The castings *c c'* contain, respectively, mechanism for the retention therein of the round and flat ends of the spokes.

E and F are sanding-belts for polishing the spokes, the belt E being upon overhung pulleys upon the frame E', and F upon similarly-located pulleys upon standards F' F². The sanding-belts are driven by belts upon pulleys *e f*, connecting with others below the floor upon counter-shafts there located.

The length of chain C (unrepresented in the breaks of Figs. 1 and 2) is about one-sixth of its entire length in each broken-away portion.

Upon shaft *a'* is a spur-gear, B, by which said shaft is revolved by a suitable motor, having mechanism for the quick control of said revolutions. Upon shaft *a* is secured a bevel-gear, a^2, gearing with a pinion, a^3, upon shaft D. Upon D are secured cam-wheels *g*, operating upon elbow-levers *h*, and connecting by means of the jointed connecting-rods *h'* with the frame E', the action of the cam-wheels producing in rods *h'* a reciprocating motion, which is imparted to the frame E' and sanding-belt E thereon. The elbow-levers *h* are fulcrumed upon a girt, h^2, in the machine-frame.

The castings *c'* of the chain contain a shaft

journaled therein, to which is attached, outside of said casting, the spur-gear *i*, said shaft being extended and forming a socket, *i'*, of the desired form for the retention therein of the tenon of the spoke. Upon the inside of one of the jaws of the socket is a sharp spur, located in a direction parallel with the direction of the shaft, which enters the wood of the spoke and assists in retaining it within said socket while it is subjected to the action of the sanding-belts. Upon the other extremity of said shaft is secured the plate *j*, Fig. 9, its length coinciding with the length of the aforesaid spoke-socket.

In the casting *c* of the chain is journaled a dead-spindle, pointed upon its inner extremity for engagement with and the retention thereon of the round end of the spoke, permitting it to revolve freely thereon. Upon said spindle, between its bearings, is placed the spiral spring *s* and the pin *k*, and outside of its bearings, near its extremity, the pin *k'*, limiting the forward movement of the spindle produced by the action of the spring *s*.

l is a spring having a wedge-shaped nose and a catch for the engagement with and retention of the pin *k*, said pin *k* being presented to it by the longitudinal movement of the spindle and compression of the spring *s*. It is there retained until released by the wedge-shaped spring-finger *m* as it is brought in contact with the pin *l'* as the chain is carried around in its course. The compression of the spring *s* is produced by the wedge-shaped finger *n* engaging with pin *l'*, and moving the spindle longitudinally until the pin *k* is caught by the catch of the spring *l*.

H H' H^2 H^3 are guides, between which the chains carrying the spokes are guided as they bring them in contact with the sanding-belts. The guides are curved for the purpose of bringing the spokes in contact with the yielding surface of said belts, and also for raising them clear of the pulleys upon which said belts are carried.

I is a rest upon which the spokes are placed by the operator, one at a time, with their tenons near the spoke-socket *i*. As the chain is carried around in its course, and each of the spindles in the pieces *c* arrive opposite the rest I, the pin *l'*, coming in contact with the finger *m*, releases the pin *k* from its catch upon the spring *l*, when the action of the spring *s* forces the center or point of the spindle into the spoke and the tenon of the spoke into the socket I. The dead-spindle is further assisted in its entrance into the spoke and the entrance of the spoke into the socket made positive by the action of the wedge-shaped guide *p*, against which the outer extremity of said spindle is brought. It is there retained and carried along by the chain until released by the finger *n*, when it drops to the floor.

The spoke *r* is represented as lying upon the rest I preparatory to its seizure by the spindle and socket, the spoke *r'* as having passed over and been subjected to the action of the polishing-belts, and *r*^{2} as released and dropping to the floor.

In order that the spoke-sockets, which are journaled in *c'*, will be presented at the rest I in the proper position for the reception of the spoke-tenons, a guiding-bar, L, of the required curve, is secured to the frame A, and causes the sockets *i'* to assume a uniform position by reason of the attitude which the plate *j*, Fig. 9, is compelled to assume in consequence of its contact with the guiding-bar L. The bar L retains the sockets in a uniform position in relation to the chain until the spur-gears *i* come into engagement with the rack M, when the bar L ceases its control of plate *j*, allowing the sockets and spokes contained therein to revolve in obedience to the action of the teeth of the rack M upon those of the spur-gear *i*. The rack M is extended along the guide H', producing a continuous revolution of the spoke during the entire time of its contact with the belts F and E. Should the rack not be continued over the entire space from belts F to E, a guide-bar, L', may be applied to the outside of the guide H, governing by its contact with the plates *j* the position in which the spoke is presented to the reciprocating belt E. The diameter of sprocket-wheels *b*, the number of their sides, and the length of the chain-links C carried upon them, the diameter of bevel-wheels *a*^{2} and *a*^{3}, and the form of the grooves in the cam-wheels *g*, the number of teeth in spur-gears *i* and in rack M bear to one another a definite relation, whereby the revolution of the spokes and the reciprocating motion of sanding-belt E will exactly coincide, causing the belt E to be at the outward extremity of its reciprocating movement while the flat side of the spoke is parallel with the belt surface, and at the opposite extremity when its edge is upon said belt. The amount of the reciprocating movement may be varied to the requirements of the article operated on. One pair of the journal-boxes of the sanding-belt E are moved longitudinally upon the frame E' by means of the screw *e'*, and standard F^2 is moved in a like direction by the screw *f'*, for the purpose of facilitating the removal and adjustment of the belts thereon.

The adjustment of the mechanism for different lengths of spokes is accomplished by moving the guides H^2 and H^3 and the chains and sprocket-wheels connected with it into the required position for the same, and substituting sanding-belts of the required width.

The inclination of the chains, sanding-belts, reciprocating and other mechanism may be placed at such an angle as will best facilitate the application and removal of the material therefrom which it is desired to polish.

Spurs with two or more prongs may be substituted for sockets *i*, for the securing of the spokes or other articles to the chain-carriers.

The operation of the machinery described

is as follows: Motion is communicated to the shaft a' through the spur-gear B, and to the sanding-belts E and F, from a suitable motor, revolving them in the direction of the arrows. The operator places each spoke upon the rest I, where it is seized by the spindle in the piece c and the socket of the piece c' of the chain-carriers, as before mentioned, and carried forward until the spur-gear i engages with the teeth of the rack M, when it is revolved continually and presented to the sanding-belt F for its action thereon, the guides H, H′, H^2, and H^3 being curved, as desired, and producing the desired pressure upon the belts E and F. Upon its approach to the belt E the rack M and spur-gear i cause it to be presented at the required point of the reciprocating movement of said belt, whereby the spoke is polished its entire length to the ten-on upon its flat sides, while its edges and the corners of the same are left untouched, or with but a slight effect of the sanding-belt thereon. The spokes proceed until, reaching the desired point, the finger n, acting upon the spindle, releases the spoke, which drops to the floor, while the catch of spring l secures the spindle in position for the reception of another as it approaches the rest I. The sanding-belts may be inclosed and a suction fan applied to said inclosure for the removal of the dust produced by them.

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

1. The combination, in a sanding-machine, of two endless chains supported upon revolving sprocket-wheels, said chains being located upon opposite sides of sanding-belts and traveling in a direction parallel with them, and being formed of links and connecting-pieces, the pieces containing mechanism for the reception and retention of carriage-spokes or other articles of uniform length and surface outline, and also, in said combination, fixed mechanism suitably located for automatically securing to said connecting-pieces and releasing from them the aforesaid spokes or other articles, and a sanding belt or belts and curved guides for bringing the article being operated upon in contact with and removing it from the yielding surface of said belts, and mechanism for revolving said article upon the belt while in contact therewith, substantially as described.

2. The combination, in a sanding-machine, of two endless chains supported upon revolving sprocket-wheels, said chains being located upon opposite sides of sanding-belts and traveling in a direction parallel with them, and being formed of links and connecting-pieces, the pieces containing mechanism for the reception of and retention therein of carriage-spokes or other articles of uniform length and surface outline, and also, in said combination, fixed mechanism suitably located for automatically securing to said connecting-pieces and releasing from them the aforesaid spokes or other articles, and a sanding-belt and curved guides for bringing the article being operated upon in contact with and removing it from the yielding surface of said belt, and mechanism for the presentation of the article being operated upon or the holder for its reception in any determined position at any fixed point in its course, and also for revolving said article upon the belt while in contact therewith, substantially as set forth.

3. The combination, in a sanding-machine, of two endless chains supported upon revolving sprocket-wheels, said chains being located upon opposite sides of sanding-belts and traveling in a direction parallel with them, and being formed of links and connecting-pieces, the pieces containing mechanism for the reception and retention therein of carriage-spokes or other articles of uniform length and surface outline, and also, in said combination, fixed mechanism suitably located for automatically securing to said connecting-pieces and releasing from them the aforesaid spokes or other articles, and sanding-belts and curved guides for bringing the article being operated upon in contact with the yielding surface of said belts and removing it therefrom, and mechanism for the presentation of the article being polished or the holder for its reception in any determined position at any fixed point in its course, and also for revolving said article upon the belts while in contact therewith, and for giving to one or more of the sanding-belts a reciprocating motion in a transverse direction to the chain-carriers coacting with the revolutions of the holder or its contained article, whereby any determined portion of the surface of said article may be subjected to the action of the aforesaid polishing process and leaving any desired portion untouched, substantially as described.

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Witnesses:
JOHN C. MITCHELL,
CHARLES E. FOSTER.