H. E. AINE.

PIPE WINDING MACHINE.

APPLICATION FILED SEPT. 21, 1910.

1,006,173.

Patented Oct. 17, 1911.

2 SHEETS—SHEET 1.

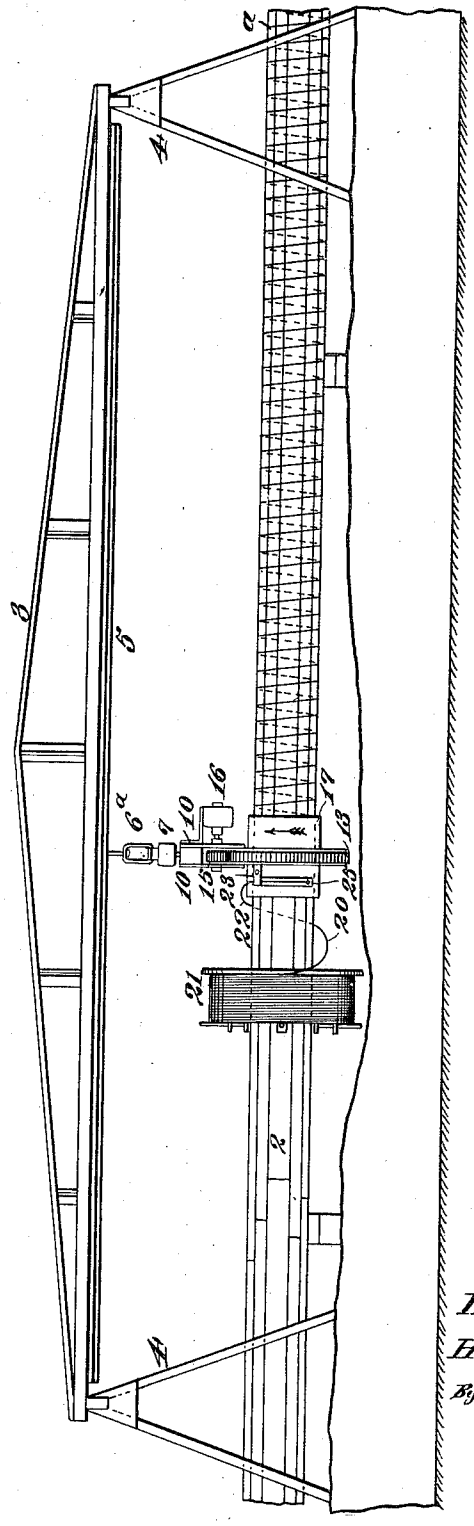


Fig. 1.

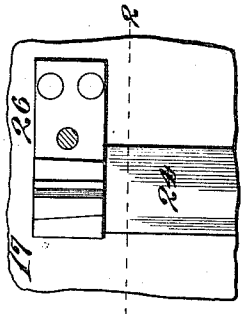


Fig. 3.

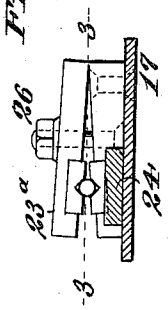


Fig. 2.

Witnesses.
Charles Pickles
R. L. Barry.

Inventor;
Harry E. Aine.
By Geo. H. Strong.
atty

H. E. AINE.

PIPE WINDING MACHINE.

APPLICATION FILED SEPT. 21, 1910.

1,006,173.

Patented Oct. 17, 1911.

2 SHEETS—SHEET 2.

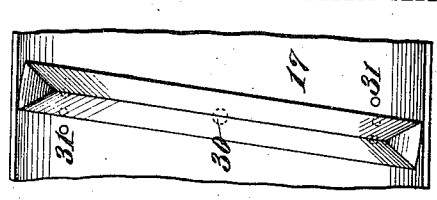


Fig. 7.

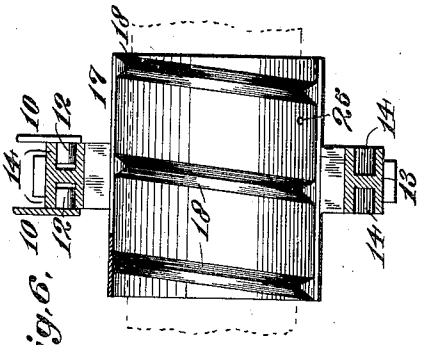


Fig. 6.

Fig. 4.

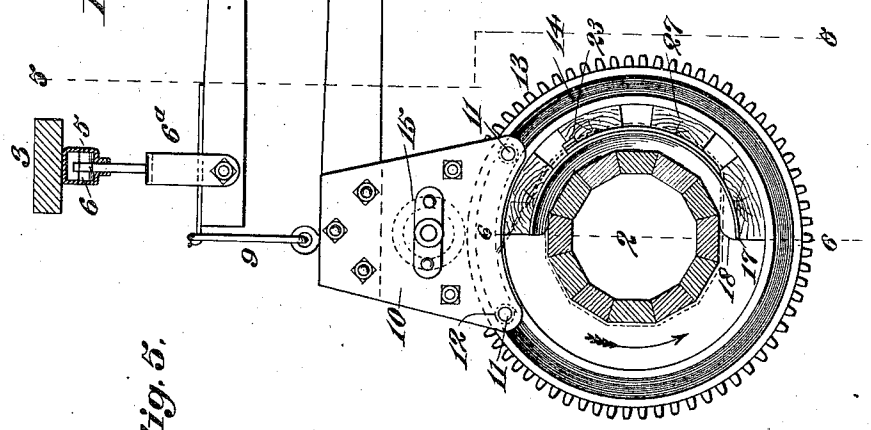
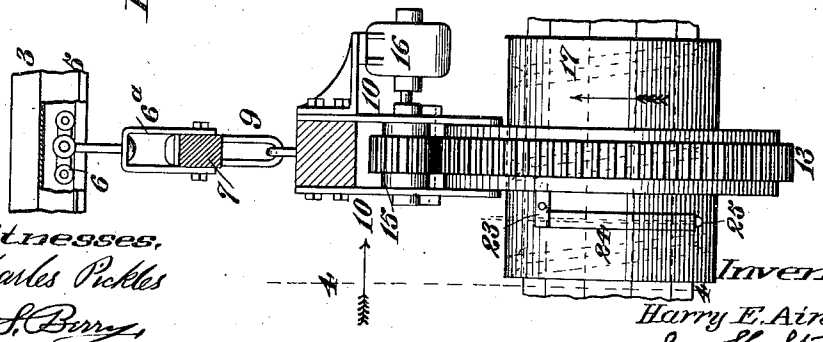


Fig. 5.



Witnesses,
Charles Pickles
R. S. Berry.

Inventor,
Harry E. Aine,
by Geo. H. Strong.
Atty

UNITED STATES PATENT OFFICE.

HARRY E. AINE, OF RICHMOND, CALIFORNIA.

PIPE-WINDING MACHINE.

1,006,173. Specification of Letters Patent. Patented Oct. 17, 1911.

Application filed September 21, 1910. Serial No. 583,045.

To all whom it may concern:

Be it known that I, HARRY E. AINE, a citizen of the United States, residing at Richmond, in the county of Contra Costa and State of California, have invented new and useful Improvements in Pipe-Winding Machines, of which the following is a specification.

This invention relates to pipe winding machinery.

The object of this invention is to provide an apparatus whereby wooden stave pipes may be erected at the place of their permanent location, and wired as fast as the erection proceeds by a continuous spiral coil of wire which is wound with equal pitch along the tube as this is constructed.

A further object of the invention is to facilitate in the construction of a substantially jointless wooden pipe; to economize in the cost of the shipment of material, and to produce a wooden stave pipe of great strength, without the use of collars, or other joint-making devices.

This invention consists of the parts and construction and combination of parts as hereinafter more fully described and claimed having reference to the accompanying drawings, in which—

Figure 1 is a side elevation of the winding apparatus, and its supporting trestle. Fig. 2 is a detailed sectional elevation of the tension clamp, on line 2—2, Fig. 3. Fig. 3 is a partial, sectional plan on line 3—3, Fig. 2. Fig. 4 is a side view of the winding device showing the tube in cross section, on line 4—4, Fig. 5. Fig. 5 is an edge view of the same. Fig. 6 is a sectional elevation of the pitch giving shell. Fig. 7 is a detailed view showing the adjustability of the pitch threads.

The present practice in the construction of wooden stave pipes is to cut and mill all of the lumber in a mill; to erect the pipe in the mill and wind the same with suitable reinforcing hoops or loops, and then to ship the assembled pipe to the location of its erection. This method of erecting wooden pipes is extremely expensive, especially where the complete sections have to be shipped great distances over railroads, and then ported over mountains.

By my invention it is possible to simply mill the necessary staves in a nearby lumber mill and then pack these into a compact mass or bundles directly upon wagons or cars, and haul them to the location where the pipe is to be erected. Then the pipe 2 is erected in place and the individual staves Fig. 1, are assembled without regards their length, care being taken only that adjacent abutting joints do not coincide. In other words, the staves are built into position to form the pipe, all of the abutting joints being staggered. In this way it is not necessary to cut the individual staves to any particular length, nor do they have to be assorted as to their length, saving consequently a great amount of material and producing a jointless, continuous pipe which will not become disconnected or become leaky through changes of weather conditions or through unreasonable ditch alinement.

For the purpose of winding the assembled pipe I employ a suitable trussed trestle 3 built of light but substantial construction temporarily supported at its ends upon suitable supports or frames 4, and provided at its lower side with a suitable track-way 5. Upon this track is mounted an appropriate truck 6 from which depends a yoke 6^a in which is pivoted an equalizing lever 7 having upon its longer end a suitable weight 8 and at its shorter end a depending link 9, readily detachable from the end of the lever 7. Mounted upon the link 9 is a pair of cheek plates 10, provided with gudgeons or pins 11 projecting toward each other from the inside of the plates and upon which are mounted anti-friction rollers 12. Upon these rollers 12 there is mounted a gear 13 recessed upon its sides, as at 14, to receive the bearing rollers 12; power being transmitted to rotate the gear 13 upon its supporting rollers 12 by a suitable pinion 15 to which power may be transmitted from any suitable source, such as motor 16 or other power generating device. Secured within the toothed annulus 13 is a semi-cylindrical shell 17 of any suitable diameter and upon the inner surface of which are secured equidistant pitch-giving devices as triangular or V-shaped bars 18 curved to conform to the inner surface of the cylinder 17. These V-shaped members project inwardly and substantially act as threads when embracing the exterior surface of the staves of the pipe 2.

The operation of this portion of the apparatus is as follows: A portion of the pipe is erected and shell 17 provided with its V-shaped ribs 18 is placed about the pipe

and the annulus 13, to which the shell 17 is detachably secured, may then be rotated to advance progressively and spirally along the pipe 2, motion being transmitted to the annulus and its attached shell 17 by the pinion 15. Wire 20 from a suitable reel 21 is then led around below the pipe between the reel 21 and the shell 17 and upwardly as at 22, into a clamp 23, thence through the clamp and over an arcuate wearing plate 24, secured to the shell 17, thence through a perforation 25 in the cylinder, and onto the exterior surface of the pipe 2. One end of the wire, as at *a*, is firmly stapled or otherwise secured to the exterior of the pipe and power is transmitted through the pinion 15 to revolve the annulus 13. This in turn carries the semi-cylindrical shell 17 around and around the pipe 2, and the engagement of the inclined pitch-giving bars 18 slightly biting into the exterior of the pipe 2 causes the entire wire winding mechanism to advance regularly and progressively longitudinally of the pipe. Any degree of tension of the wire about the pipe may be obtained by means of the tension clamp 23 the upper jaw 23^a of which may be drawn down tightly upon the wire 20 as indicated in Fig. 2, by means of a suitable bolt 26, or other appropriate device. It will thus be seen, by referring to Fig. 1 that as the annulus 13 is driven in the direction of the arrow that it will tightly wind the wire 20 about the surface of the pipe 2 and by reason of the automatic spiral advance of the shell about the pipe 2, the cheek plates 10 and its associated truck 6 will be automatically advanced along the track and trestle 3. Manifestly, the trestle 3 will be of such a length as can be conveniently handled by the operators and after the wire 20 has been spirally wound about the pipe 2, the full length of the space between the supports 4 of the trestle, the loop 9 is thrown off of the equalizing lever 7 allowing the weight of the winding device to rest upon the pipe 2 and the operators then shift forwardly the supports 4 and its superposed trestle 3, when the loop 9 is again placed into operative position with the lever 7, and the pinion again driven thus progressing construction without making any joint whatsoever in the pipe 2.

The annulus 13 is shown as being of considerable larger diameter than the shell 17 and when it is desired to wind a spiral wire about a different size pipe 2, if the shell 17 is not of the requisite dimension it may be removed, along with its spacing blocks 27 by which it is spaced from the annulus 13, and another shell of the proper dimension fitted upon the pipe to be wound. Manifestly for each different radius of shell 17 the several spacer blocks 27 will vary according to the distance between the inner surface of the annulus 13 and the exterior of the shell 17. By this manner of mounting the wiring shell 17 I am enabled to use the same annulus upon a large range of pipes by simply varying, as before stated, the diameter of the shell, and using appropriate spacing blocks 27 to attach the same within the annulus 13.

The function of the counter-balancing lever and its weight 7 is to neutralize, to the appropriate degree, the weight of the wiring apparatus upon the body of the pipe as the wiring proceeds thereby reducing the amount of friction of the advancing apparatus on the pipe.

In Fig. 7 I have shown in detail one of the pitch-giving bars 18 as being pivoted at 30 upon the shell 17 and by this pivoted pitch bar 18, the shell may be set to run either a right hand or left hand thread as desired by simply securing the bar 18 in a corresponding angular position; the shell 17 being perforated as at 31 for the reception of a bolt or other locking device, whereby when the adjustable bar 18 has been moved to the desired angle, it may be firmly fastened in such position to the shell 17. The holes 31 are arranged upon arcs struck upon the center or pivot 30 about which the bar pivots.

It will be seen by referring to Fig. 1 that as the wiring apparatus, including the annulus 13 and its associated shells 17 are revolved upon the pipe 2 that the wire 20 will be simply unwound continuously from the reel 21, which is mounted upon the pipe in any suitable manner in advance of the wire winding mechanism.

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

1. A wire-winding apparatus comprising a rotatable annulus, an adjustable, detachable semi-cylindrical pipe embracing shell mounted within said annulus, said shell having pitch-giving bars on its inner surface to cause the member to advance spirally about the pipe, means for rotating said annulus, and means for supplying wire to the pipe.

2. A wire-winding apparatus comprising a rotatable annulus, a member in the form of a segment detachably mounted within said annulus having its inner surface provided with pitch-giving bars adapted to advance the member about the pipe to be wrapped, means for rotating the annulus, means for supplying wire to the pipe, said member being of substantial length, and the pitch-giving bars being spaced equidistant along the interior of said member, and means comprising a weighted member connected to the wiring devices for neutralizing the weight of said devices upon the body of the pipe.

3. In a wooden stave pipe winding de-

vice, a combination with a suitable track way of a truck adapted to travel thereon, a suspension device connected thereto, a counter-balancing lever, a bearing, supported upon the short end of said lever, an annulus rotatable in said bearing, and an adjustable, detachable semi-cylindrical pipe embracing shell having a pitch giving device upon its inner surface whereby the shell is caused to advance spirally along the pipe when the annulus is rotated.

4. In a wooden stave pipe winding device, a combination with a suitable track way of a truck adapted to travel thereon, a suspension device connected thereto, a counter-balancing lever, a bearing supported upon the short end of said lever, an annulus rotatable in said bearing, an adjustable, detachable semi-cylindrical pipe embracing shell, having a pitch giving device upon its inner surface whereby the shell is caused to advance spirally along the pipe when the annulus is rotated, and means whereby wire may be fed to the interior of the winding shell.

5. A wire-winding apparatus comprising a pipe embracing member having means to cause it to advance spirally about a pipe, means for supplying wire to the pipe, an overhead traveling carrier, and connections therewith for suspending said member from a point above the pipe, said connections including a counter-balancing lever from which the embracing member is suspended.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HARRY E. AINE.

Witnesses:
A. GITTINGS,
J. E. LOWNEY.