No. 843,519. PATENTED FEB. 5, 1907.

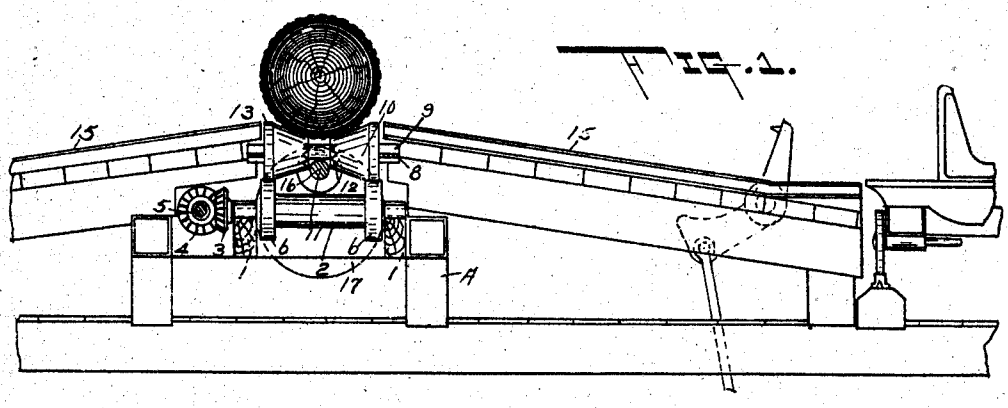
D. CRANE.

TRACTION ROLL MECHANISM.

APPLICATION FILED MAY 31, 1906.

2 SHEETS—SHEET 1.

FIG. 1.



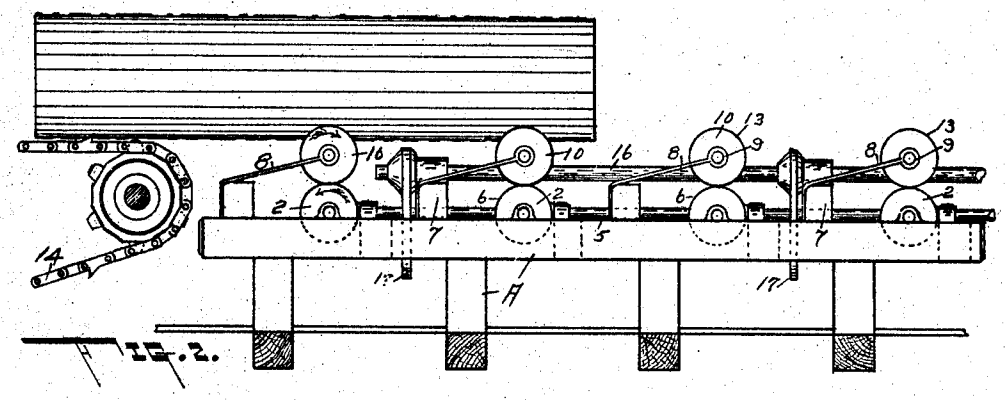


FIG. 2.

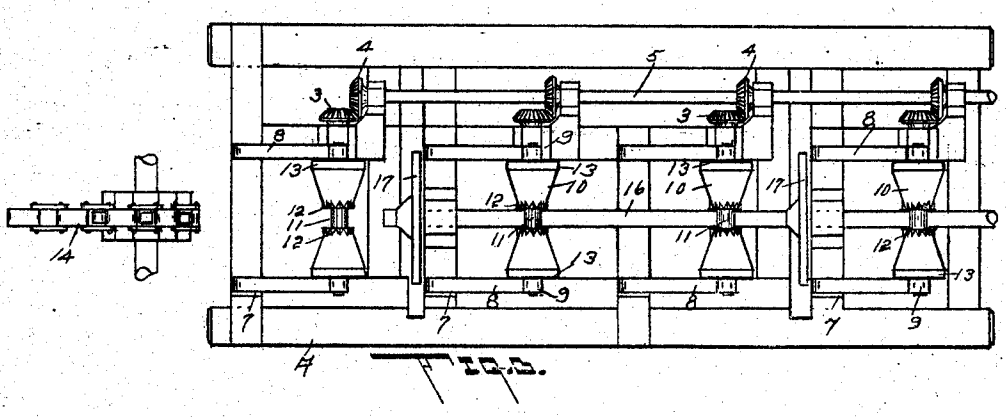


FIG. 3.

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2 SHEETS—SHEET 2.

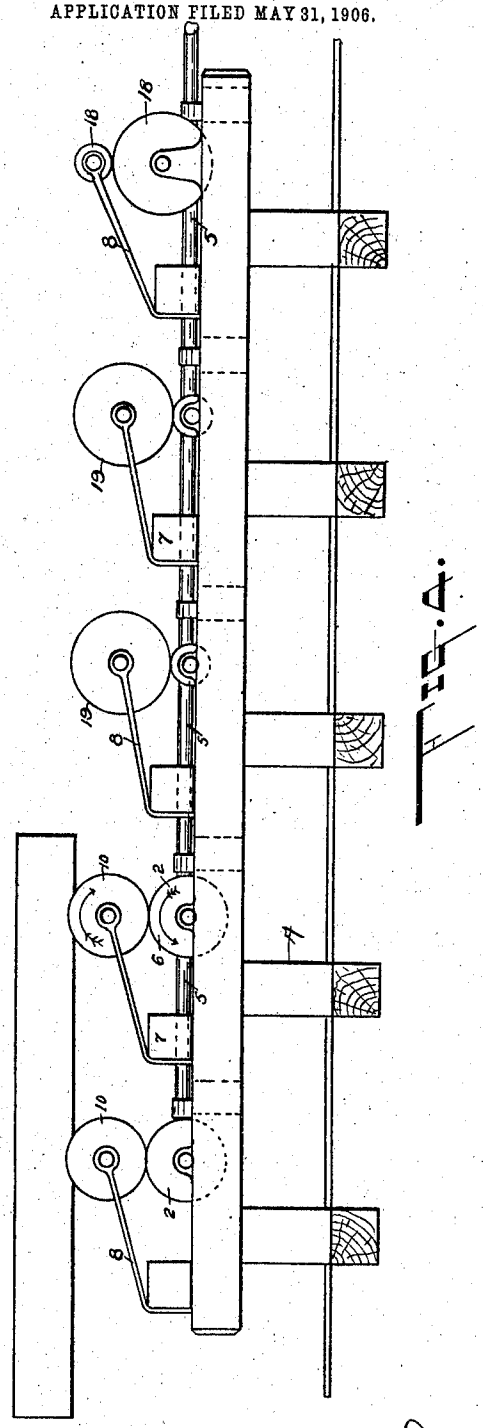


Fig. 4.

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DANIEL CRANE, OF SAGINAW, MICHIGAN.

TRACTION-ROLL MECHANISM.

No. 843,519. Specification of Letters Patent. Patented Feb. 5, 1907.

Application filed May 31, 1906. Serial No. 319,646.

To all whom it may concern:

Be it known that I, DANIEL CRANE, a citizen of the United States, residing at Saginaw, in the county of Saginaw and State of Michigan, have invented certain new and useful Improvements in Traction-Roll Mechanisms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to a traction-roll mechanism, and in the present application I have illustrated and described my invention applied to log-conveyers for carrying logs to any suitable sawing mechanism, although it is equally applicable to lumber-conveyers for removing the sawed lumber from the sawmill.

Hitherto it has been customary to feed the log directly to a positively-driven conveyer, which carried the logs to the desired point, where they were kicked off the conveyer by any suitable mechanism onto the log-deck. There are two great defects to this mechanism, the first of which is that the log-deck could not be made inclined on both sides of the conveyer by reason of the mechanism for driving the conveyer, so that a flat space was left immediately adjacent the conveyer and upon which the log would land with considerable force and noise, after which the log was as liable to roll toward the conveyer as from it. Secondly, by employing the positively-driven rolls for directly supporting and conveying the log the latter was given a very considerable impetus, so that in the event that anything should clog or obstruct the movement of the conveyer the log was suddenly propelled forward, to the great injury of the conveyer and of anything in the path of movement of the log. On the other hand, if the log met with an obstruction the force of the conveying mechanism exerted against the log quite often tore out the machinery and seriously injured the conveyer. This frequently occurred when the conveying mechanism was driven by the log-chain-driving mechanism.

My invention is designed to avoid and obviate these disadvantages, to which end I preferably, though not necessarily, provide independent driving means for the log-chain and conveyer respectively, as well as providing the conveyer with driving means not positively connected with the source of power and adapted to support and convey the logs, so that should the log encounter an obstruction the supporting or traction rolls will cease to rotate, and hence the log will not be impelled forward, and upon the removal of the obstruction the log will be automatically fed forward again. By reason of this construction the log is supported at such a height above the driving mechanism that the inclined deck may extend to the extreme edge of the conveyer on opposite sides.

Another object of my invention is to provide a construction which is much lighter than those formerly used for a similar purpose, and thus reduce the cost of manufacture.

Heretofore it has been necessary to make every part as strong as possible to withstand the stress and strain. Naturally this greatly increased its cost, and by actual experience I find that I can furnish my entire machine more cheaply than former log-conveyers can be bought.

A further advantage attained by my invention is that the traction-roll being frictionally driven obviates all liability of breakage and the consequent cost of repairs.

Still another advantage resides in the fact that by properly proportioning the drive and traction rolls relative to each other the logs or sawed lumber can be fed at different speeds along the conveyer irrespective of the speed of the single drive-shaft. Heretofore it has been necessary to provide two or more drive-shafts operating at different speeds to effect this result.

To these and other ends, therefore, my invention consists in certain novel features and combinations of parts, together with their equivalents, such as will be more fully described hereinafter, and particularly pointed out in the claims.

In the accompanying drawings, wherein are illustrated one embodiment of my invention, Figure 1 is an end view of a log-conveyer equipped with my invention and showing the inclined log-decks. Fig. 2 is a side view, the log-decks being omitted. Fig. 3 is a top plan view thereof, and Fig. 4 is a side view showing the different sizes of traction and drive rolls.

In the first place, it should be understood that I apply my invention to the usual form

of log or sawed-lumber conveyer, certain portions only of which are slightly modified to coöperate with the elements embodying my invention. Therefore A indicates any suitably-supported frame provided with the longitudinal stringers 1 1, spaced apart from each other, the drive or live rolls 2 2 being suitably journaled on the stringers in any approved manner, one journal of each roll being equipped with a gear 3, meshing with a drive-gear 4, secured on a drive-shaft 5, driven from any suitable source. This construction is all well known and needs no further description, it being obvious that the rotation of the drive-shaft 5 will rotate all the drive-rolls 2 2 in the same direction, which in former constructions was counter to the arrows on Figs. 2 and 4.

The drive-rolls may be of any suitable size or shape, but are preferably provided with circular friction-surfaces 6 6 for a purpose hereinafter set forth.

Projecting above the stringers 1 1 at points in advance of the drive-rolls are the standards 7 7, to which are preferably secured the resilient or flexible arms 8 8, extending parallel with the stringers, the free ends of which arms project to a point over or approximately over the journals of the drive-rolls and are themselves provided with journals 9 to receive the pintles of the traction or friction rolls 10 10. These traction-rolls are of any suitable length or conformation suited to the shape of the material to be conveyed, each of the rolls in the present instance being in shape like a pair of truncated cones, the reduced ends of which are connected by a neck 11. I may also tooth the adjacent ends of the cones, as at 12, to the end that small logs received on the friction-rolls and lacking in weight may be engaged and positively fed forward by the teeth. These teeth are not a necessary incident of the invention and may be dispensed with, if desired.

The bases of the conically-shaped friction-rolls are provided in this instance exteriorly with friction-surfaces 13 13, adapted to engage the surfaces 6 6 of the drive-rolls, whereby the friction-rolls are rotated; but it is obvious that some other form of friction drive might be substituted for that herein illustrated.

The arms 8 8, as set forth, may be resilient, so that when no logs are resting on the traction-rolls the latter are automatically raised off of the drive-rolls, or the traction-rolls may lie at all times in contact with the live rolls.

A log-chain 14, driven in any suitable manner separate from driving-shaft 5, may bring the logs from the pond or other location to the receiving end of the conveyer, the logs being forced by the chain onto the traction-rolls, which then support and feed the logs. By superposing the traction-rolls upon the live rolls the log is supported a sufficient distance above the drive-shaft so that the log-decks 15 15 may be inclined to the opposing ends of the traction-rolls, as shown in Fig. 1, any suitable sawing mechanism being located at the foot of the inclined log-decks. The logs lie upon the converging inclines of the traction-rolls as in a trough, and as they are brought opposite the points where the sawing mechanisms are located they are kicked out of the trough and off the traction-rolls in any suitable manner, the logs rolling gently off the traction-rolls on either side and making hardly any noise.

As one means for effecting the removal of the logs from the conveyer I may provide a longitudinally-extending rod 16, located intermediate the drive and traction rolls and parallel with the stringers 1 1, said rod passing just beneath the neck of the traction-roll and having the eccentrics 17 17 secured at intervals in its length. This rod may be rotated in either direction to kick the log off onto either log-deck.

As the log arrives at a suitable point the shaft 16 is rocked in one direction or the other, depending upon which log-deck it is desired that the log shall roll down. The engagement of the eccentric with the log will cause the latter to travel up one cone or the other of the traction-rolls and permit it to be gently received upon the upper end of either deck down which it rolls.

Other kickers can be used in place of that shown, the one disclosed being merely to illustrate the operation and manner of use of my invention.

It is sometimes desirable to carry the logs or sawed lumber at different speeds during their passage along the conveyer, and in order to accomplish this result heretofore the drive-rolls have been connected in sets to drive-shafts rotating at different speeds. By means of my arrangement of rolls, however, it is possible to drive all the live rolls 2 by means of the single shaft 5 and by varying the sizes of the drive and traction rolls relative to each other, as shown at 18 and 19 in Fig. 4, the rolls 18 being so arranged that the log or sawed lumber is given a higher speed of travel than that imparted to it by the rolls, because the traction-rolls are smaller than the drive-rolls, whereas in the pair of rolls 19 the traction-roll is larger than the drive-roll, whereby the speed of travel of the log or sawed lumber is reduced.

From the foregoing it will be noticed that I have devised a very simple yet highly efficient and noiseless mechanism for conveying logs to the sawing mechanism, and it is obvious that a very slight change in the shape of the traction-rolls will adapt the mechanism to be associated with the usual live rolls in the rear of the saw for conveying the sawed lumber therefrom.

The operation is easily understood. Movement being imparted to the log-chain, a log is brought into engagement with the lower end thereof (not shown) and is hoisted by the chain and delivered onto the traction-rolls. The speed of the log-chain and of the first traction-rolls is preferably the same, though not necessarily so. The rotation of the drive-shaft 5 will impart motion through the gears to the drive-rolls 2 2, which in turn will rotate the traction-rolls, the weight of the log in the present instance causing the traction-rolls to rest firmly upon the drive-rolls, and the log will be impelled forwardly along the conveyer. The traction and drive rolls are preferably parallel with each other, and while I have shown each set of rolls as provided with abutting friction-surfaces it is plain that other forms of surfaces might be used without departing from the invention. The increased weight of the logs will increase the driving power of the traction-rolls by reducing the liability of slipping. Should the log meet an obstruction sufficient to overcome the frictional resistance of the abutting surfaces, it would instantly cease its forward travel and the rotation of the traction-rolls would stop, the drive-rolls slipping or rubbing against the surfaces 13 of the traction-rolls until the obstruction is removed, whereupon the forward travel of the log will be instantly and automatically resumed without shock, jar, or injury to any of the elements.

When conveying sawed lumber particularly, I preferably provide the sets of rolls like those shown at 18, so that the speed of travel of the lumber will be increased, and similarly when it engages sets of rolls like those illustrated at 19 its speed will be retarded.

It is evident that many changes might be made in the form and arrangement of the several parts described without departing from the spirit and scope of my invention, and hence I do not wish to limit myself to the exact construction set forth.

Having thus fully disclosed my invention, what I claim as new is—

1. In a conveyer, the combination with a set of live rolls, a single drive-shaft extending transversely of the ends of the rolls for imparting a single speed to the rolls, and gearing for connecting the respective rolls to the shaft, of a set of traction-rolls located above the live rolls and frictionally driven thereby.

2. A conveyer comprising live rolls, means for positively driving the rolls, and a set of traction-rolls located yieldingly above the live rolls and frictionally engaging the same to permit a slipping of the traction-rolls relative to the live rolls or vice versa.

3. In a conveyer, the combination with a set of live rolls, a drive-shaft, gearing connecting the drive-shaft with each of the rolls, a log-chain and separate means for driving the chain, of a set of traction-rolls projecting into a plane above the drive-rolls and frictionally driven thereby.

4. A conveyer comprising a plurality of live rolls, means for driving all the rolls at the same speed, certain of the live rolls being larger than others and a plurality of traction-rolls projecting into a plane above the live rolls and being frictionally driven thereby, the highest points of all the traction-rolls being in horizontal alinement.

5. A conveyer comprising a plurality of live rolls, means for driving all the rolls at the same speed, certain of the live rolls being smaller than others and a plurality of traction-rolls projecting into a plane above the live rolls and being frictionally driven thereby, the highest points of all the traction-rolls being in the same horizontal alinement.

6. A conveyer comprising a plurality of live rolls, means for actuating all the rolls at the same speed, a plurality of traction-rolls projecting into a plane above the live rolls and frictionally driven thereby, the pairs of traction and live rolls being suitably proportioned relative to each other to impart a greater or lesser speed of travel to the material being conveyed.

7. The combination in a conveyer, of a plurality of live rolls, friction-surfaces carried thereby, a plurality of traction-rolls arranged parallel with the live rolls, and projecting into a plane above the live rolls, the traction-rolls each comprising a pair of truncated cones, the reduced ends of which lie opposite each other and a smaller neck connecting the cones, the traction-rolls being frictionally driven by the live rolls.

8. A frictionally-driven traction-roll comprising a pair of truncated cones, the reduced ends of which lie opposite each other, teeth formed on the reduced ends of the cones, a neck of less diameter than the reduced ends of the cones for connecting the latter and a friction-surface on the roll.

9. A frictionally-driven traction-roll comprising a pair of truncated cones, the reduced ends of which lie opposite each other, a neck of less diameter than the reduced ends of the cones for connecting the latter and a friction-surface on the roll.

10. The combination in a conveyer, with a plurality of live rolls, of a plurality of traction-rolls arranged parallel therewith and supported above the live rolls, the traction-rolls being frictionally driven by the live rolls, a kicker-shaft located between the pairs of live and traction rolls and kickers mounted on the shaft intermediate the pairs of rolls.

11. The combination in a conveyer with a plurality of live rolls, of a plurality of traction-rolls arranged parallel therewith, the live and traction rolls arranged in pairs and flexible arms for supporting the traction-rolls above their respective live rolls, the traction-

rolls being frictionally driven from the live rolls.

12. The combination in a conveyer with a plurality of live rolls, of a plurality of traction-rolls arranged parallel therewith, the live and traction rolls arranged in pairs, and resilient arms supporting the traction-rolls above their respective live rolls, the traction-rolls being frictionally driven from the live rolls.

In testimony whereof I affix my signature in presence of two witnesses.

DANIEL CRANE.

Witnesses:

GEO. B. WILLCOX,

RALPH S. WARFIELD.