

M. CONRAD.
PROCESS OF MAKING WHEEL FELLIES
APPLICATION FILED JULY 24, 1908.

925,868.

Patented June 22, 1909.

Fig. 1.

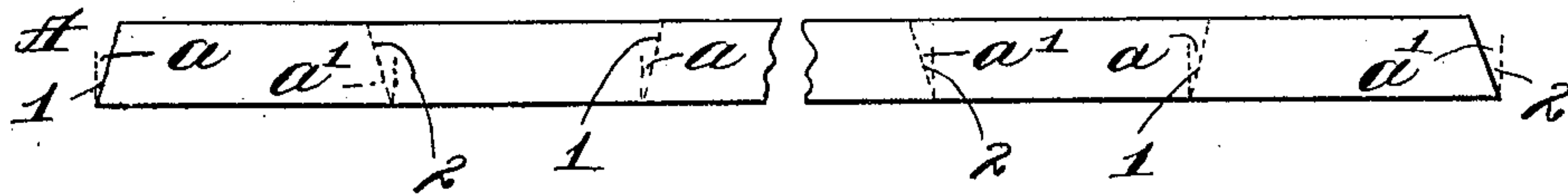


Fig. 2.

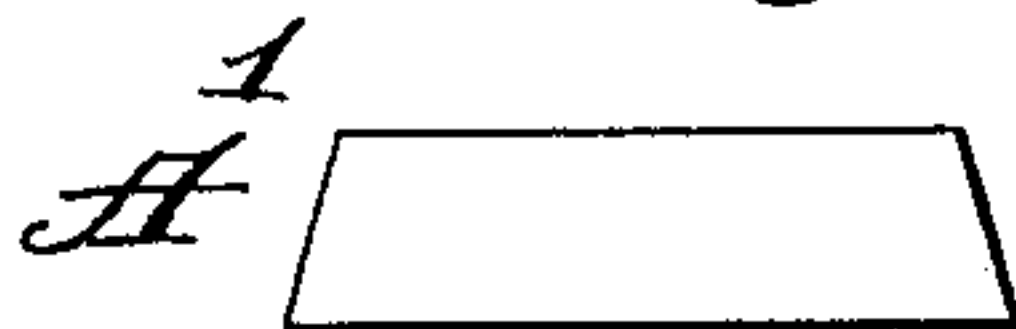


Fig. 3.

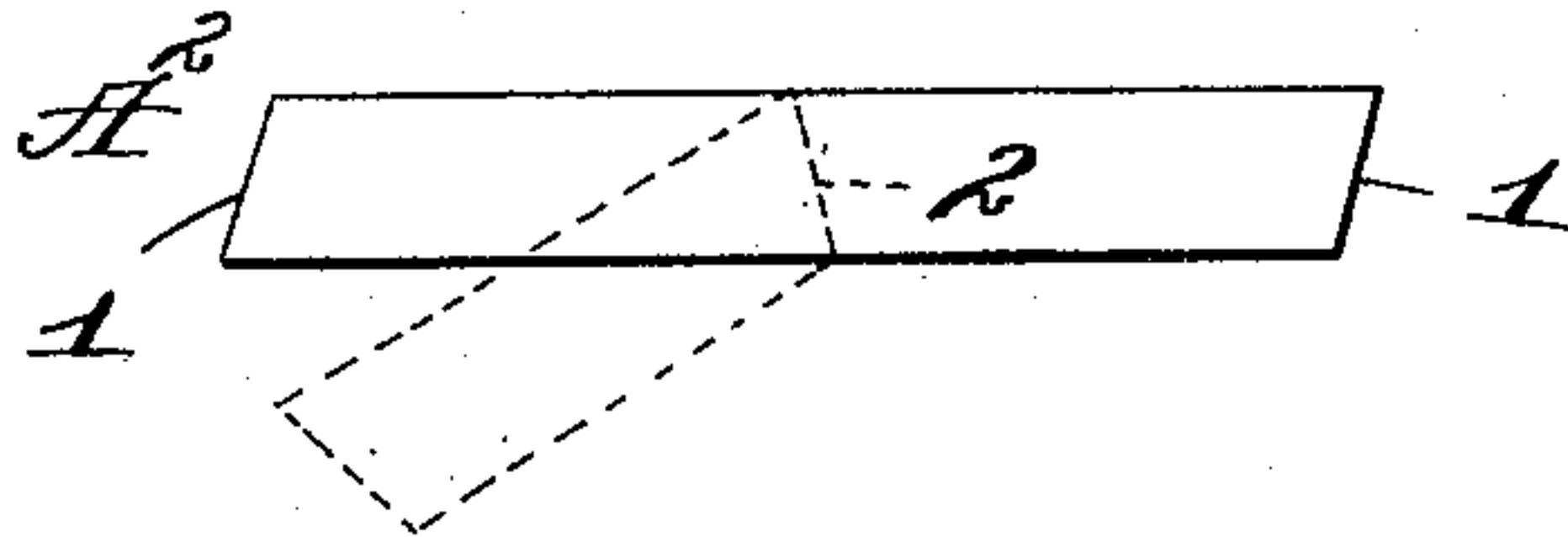


Fig. 4.

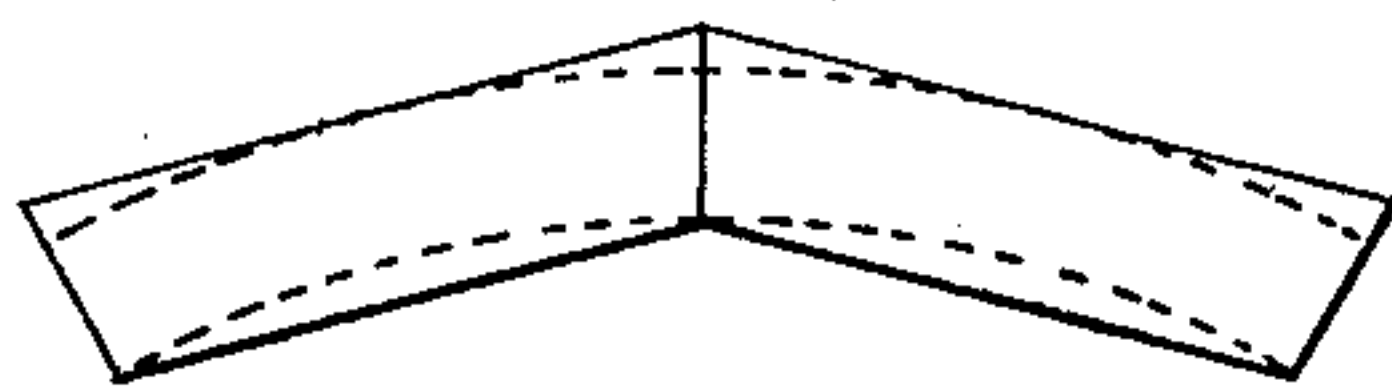
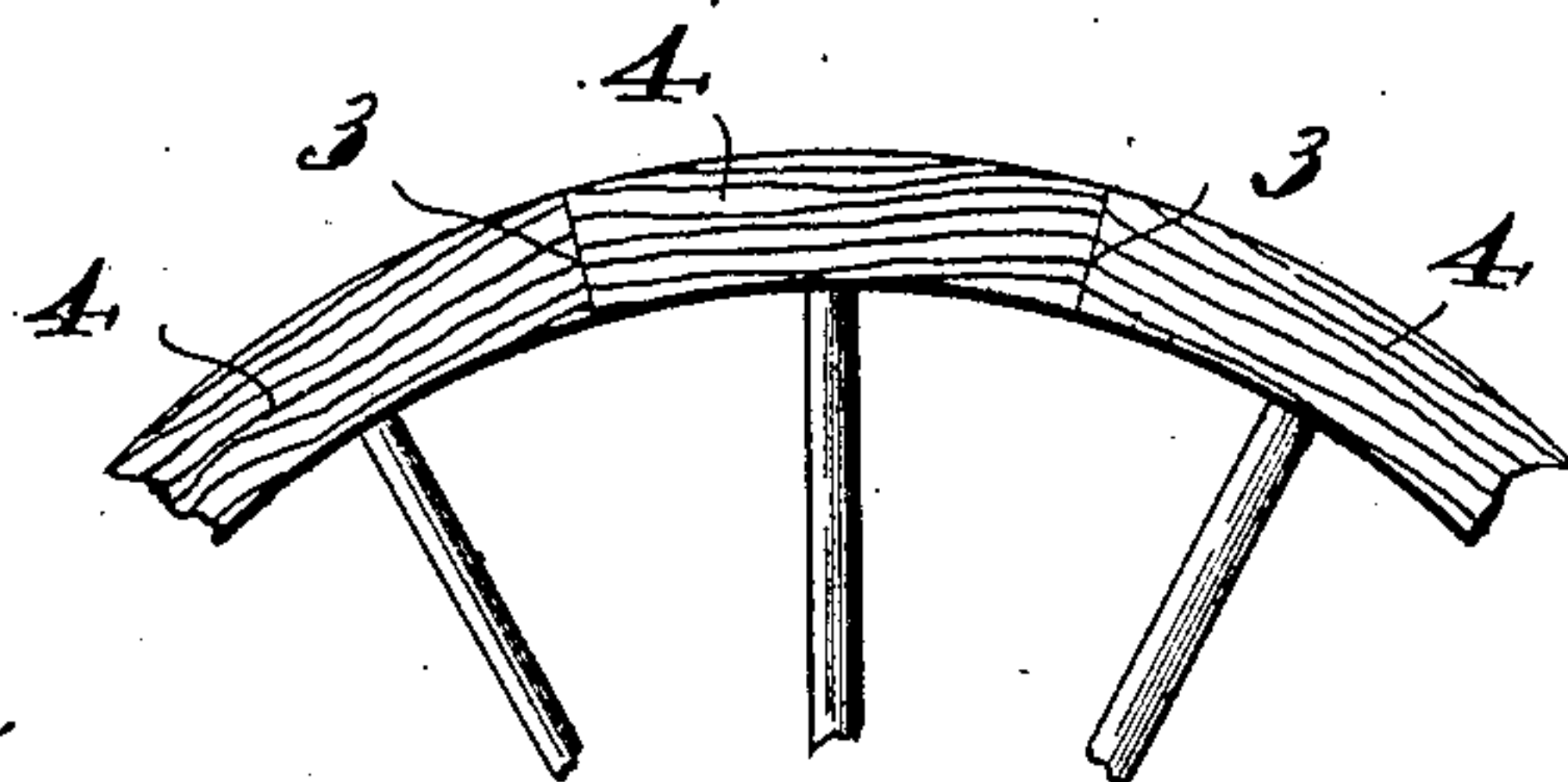


Fig. 5.



Witnesses:

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UNITED STATES PATENT OFFICE.

MARTIN CONRAD, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO CARL SCHUTTLE, OF CHICAGO, ILLINOIS.

PROCESS OF MAKING WHEEL-FELLIES.

No. 925,868.

Specification of Letters Patent.

Patented June 22, 1909

Application filed July 24, 1908. Serial No. 445,084.

To all whom it may concern:

Be it known that I, MARTIN CONRAD, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented a certain new and Improved Process of Making Wheel-Fellies, of which the following is a specification.

This invention relates to an improved process of making wood wheel rims and particularly for making rims for the wheels of standard farm wagons and the like.

In standard farm wagons, the front wheels are commonly made with twelve spokes and the rear wheels with fourteen spokes, and, so far as I am aware, it is the universal practice to make the fellies of this class of wagons of sufficient length to receive two spokes each, said fellies being cut from separate pieces of lumber of proper length and width. Owing to the curvature of the fellies, this method of manufacture is objectionable for various reasons and the fellies produced thereby are recognized as structurally imperfect in important respects. Among these may be enumerated the following:—1. The large waste of lumber incident thereto. 2. Owing to the width of the lumber required, approximately six inches, only old or first growth timber can be used, tougher and stronger second growth timber being unavailable for the purpose. 3. The shrinkage, being equal to that of the full width of the lumber from which the fellies are cut, is excessive and, particularly in hot, dry weather, is apt to cause the tires to become loose in a very short time. 4. Owing to the length of the fellies, the grain of the wood at the ends thereof, necessarily runs "crosswise", producing a strong tendency to "chinning", that is, for pieces of the fellies to split off at the joints, particularly when subjected to severe strain, as in hauling heavy loads over rough roads. 5. Owing to the fact that the grain is unavoidably "crossed" at the joints, it is necessary, in order to secure requisite strength, to make the fellies heavier than would otherwise be necessary if the grain ran circumferentially or straight around the rim, or practically so. 6. In order to save time in seasoning, the fellies are "blanked" prior to thorough seasoning, and, owing to the grain being "crossed", it is found that there is a considerable percentage of loss, owing to checking and splitting of the wood in seasoning.

The foregoing objectionable features may be overcome by the use of rim sections or fellies equal to the length of the circumference of the wheel divided by the number of spokes in the wheel: 1, by effecting a saving of almost one-half in the stock required; 2, by rendering smaller stock available, whereby it is possible to use second growth timber; 3, by reducing shrinkage approximately 40 per cent., thereby correspondingly lessening the liability of the tires becoming loose; 4, by producing wheel rims in which the grain of the wood runs practically circumferentially thereof, thus practically preventing all chinning and with the same size of fellies producing much stronger wheels.

While the foregoing advantages possessed by wheels consisting of as many fellies or rim sections as there are spokes in the wheel, are obvious and are generally well recognized by wagon manufacturers, wheels of this character are practically unused for the reason that, as heretofore constructed, they have lacked one feature or characteristic essential in wheels for standard farm wagons, to-wit, resilience. As is well known to those skilled in wagon construction, resilient rims are essential to practically successful wagon wheels of this character, such resilience operating to distribute the stresses to which the wheels are subjected in use, as in hauling heavy loads, to all parts of the rim, thus preventing concentrated stresses at given points, as in line with the different spokes, which would soon operate to force the spokes into the hub of the wheel or to crush the fellies down over the ends of the spokes, either of which would reduce the size of the rim until it was smaller than the tire, producing the condition known as "felly-bound," the rim being dead and the spokes loose, and rendering the wheels practically useless. This resilience is produced by making the separate fellies on an arc of slightly greater radius than the radius of the finished wheel. Thus, when assembled, preparatory to setting the tire, the joints between the fellies will be slightly higher than the true circle of the finished wheel, the setting of the tire operating to flex the fellies and to hold them flexed. Said fellies will thus always be under tension, so as to react in a familiar manner to distribute the shocks and jolts to which the wheels are subjected in use.

Owing to the stiffness and inflexibility of

the fellies or rim sections of wheels containing as many fellies as spokes, the methods of manufacture heretofore practiced in constructing such wheels, which have consisted
 5 in assembling the fellies or rim sections separately on the ends of different spokes, and then setting the tire, have invariably resulted in producing wheels having practically
 10 no resilience and hence, for reasons heretofore stated, very weak and practically worthless. I have discovered, however, that necessary resilience in wheels comprising as many fellies or rim sections as there are
 15 spokes in the wheel, can be provided by joining said fellies together in pairs to form fellies or rim sections of substantially the size and shape of standard two-spoke fellies, said two-part fellies being made on an arc of slightly greater radius than the radius of the
 20 finished wheel, in substantially the same manner as standard two-spoke fellies, the setting of the tire operating to flex said two-part fellies to give necessary resilience to the wheel. By my improved process of construction, I am able to realize all of the recognized advantages inherent in separate fellies
 25 or rim sections for each spoke and am also able to overcome the one great disadvantage thereto.

30 My improved process consists in the various steps hereinafter described and claimed.

To better illustrate my improved process, reference is had to the accompanying drawings, in which—

35 Figure 1 is a diagrammatic view of a stick of lumber of sufficient length to form several fellies or sections of fellies, showing the method of severing the same. Fig. 2 is a side view of one of the sections so severed
 40 from the stick of timber. Fig. 3 is a diagrammatic view, showing, in full lines, a piece of lumber of proper length to form a pair of fellies, and, in dotted lines, the method of severing and joining same in accordance with my improved process. Fig. 4
 45 is a side view of two fellies joined at their ends preliminary to finishing the same as a unit; and Fig. 5 is a diagrammatic side view of a portion of a wheel rim, showing the directions of the grain in different sections thereof.
 50

When constructed in accordance with my improved process, the rims of the wheels consist of as many different sections as there are
 55 spokes, each of which may be considered as a separate felly.

In the practice of my invention, the sticks of lumber A, Fig. 1, are first dressed roughly to proper width and thickness to form the
 60 rim sections or fellies, which, owing to the fact that said fellies are only one-half as long as standard fellies, need be only about one-half the width of the lumber used for making standard fellies, that is, fellies of proper
 65 length to receive two spokes. Said sticks A

are then cut up into pieces A^1 , Fig. 2. To avoid waste, the sticks of lumber A are preferably made of uniform length, which is an even multiple of the length of the pieces A^1 at their centers. Also, the lines of severance
 70 comprise series 1 and 2 which are, respectively, oppositely inclined to the edges of the sticks of timber A at similar angles a , a^1 to bring the joints 3 of the rim of the wheel on radial lines, when the wheel is finished. Said
 75 angles are each equal to 360 degrees divided by twice the number of rim sections or fellies in the wheel, or, what is the same thing, by twice the number of spokes in the wheel. For convenience in handling, the sticks of
 80 timber A are preferably cut into pieces A^2 , Fig. 3, the ends of which are inclined to the edges thereof at angles corresponding to the lines of severance 1 or 2, say to the line 2, and which are of a length such that, when
 85 cut or severed on the other line of severance, 1, they will each form two fellies A^1 . As the available machinery for finishing wheel fellies for this class of wagons is, as previously stated, all adapted for making fellies of
 90 standard length, said fellies A^1 are preferably secured together in pairs, in any suitable or approved manner not necessary to be described, with their long and short edges together, respectively, substantially as shown
 95 in Fig. 4.

Cutting the sticks of timber into pieces A^2 admits of a very convenient and expeditious method of operation, which consists in severing said pieces A^2 to form separate fellies A^1 ,
 100 turning one of said fellies A^1 over to bring the long and short edges, respectively, of such fellies together and then joining the ends thereof in this position. After being joined together in pairs, in the manner described, to
 105 form what may be referred to as standard felly blanks, said fellies may be finished and the parts of the wheel assembled in accordance with any usual or approved method of manufacture. Obviously if the lines of severance 1 and 2 extend as described, there will
 110 be absolutely no waste of stock in forming the joints 3, except that represented by the width of the saw cuts.

In Fig. 5 of the drawing, I have shown a
 115 section of the rim of a wheel constructed in accordance with my improved process, indicating, at 4, the grain of the wood which is thus seen to extend substantially circumferentially of the rim of the wheel, so as to
 120 give very great strength. Also, the grain is but very slightly "crossed" at the joints 3, thus practically preventing all liability to "chinning," or if any "chinning" occurs, it will be so slight as not appreciably to affect
 125 the strength or appearance of the wheel. Thus, with the same size of felly, I secure much greater strength, or to obtain the same strength I am enabled to use lighter stock, thereby effecting a further saving.
 130

By my improved method of manufacture it is thus obvious that the various objectionable features of wheels of this character, as at present constructed, are effectually overcome 5 and the objects of the invention attained in a simple and practical manner.

I claim:—

10 The process of making standard wood fellyes, which consists in cutting the lumber into pieces substantially equal in length at their centers to the mean circumference of the wheel rim divided by the number of spokes in the wheel, the ends of said pieces being oppositely inclined to the edges of the lumber

at similar angles equal to 360° divided by 15 twice the number of spokes in the wheel, and joining said lengths together in pairs with their long and short edges continuous with each other, respectively, to form a standard felly blank. 20

In testimony, that I claim the foregoing as my invention, I affix my signature in presence of two subscribing witnesses, this 20th day of July, A. D. 1908.

MARTIN CONRAD.

Witnesses:

CARL SHUTTLE,
J. B. SNYDER.