Nov. 18, 1924. **1,516,328**

J. E. BROXON

MACHINE FOR ASSEMBLING SPOKES IN WHEELS

Filed Oct. 11, 1922 2 Sheets-Sheet 1

Fig. 1.

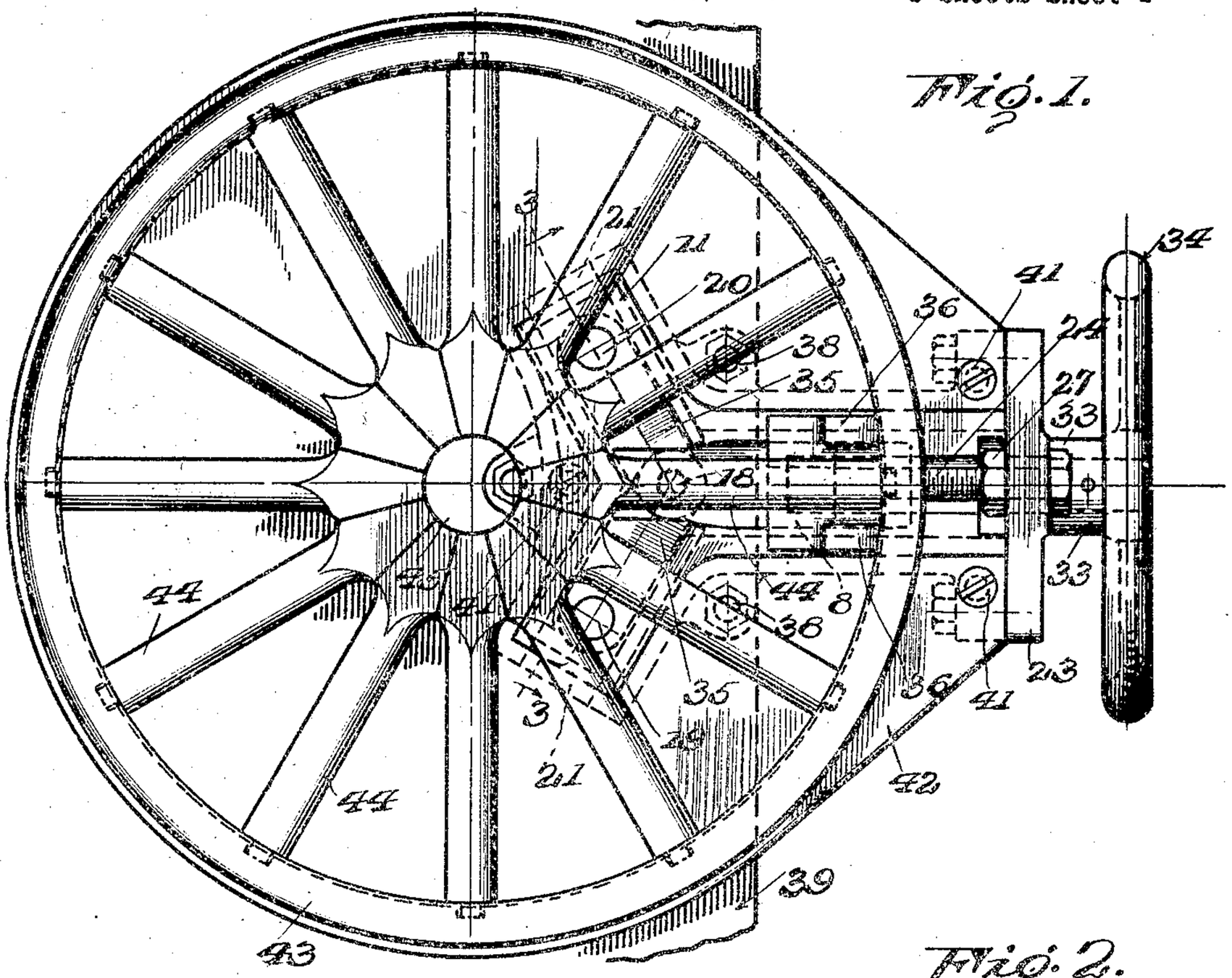

Fig. 2.

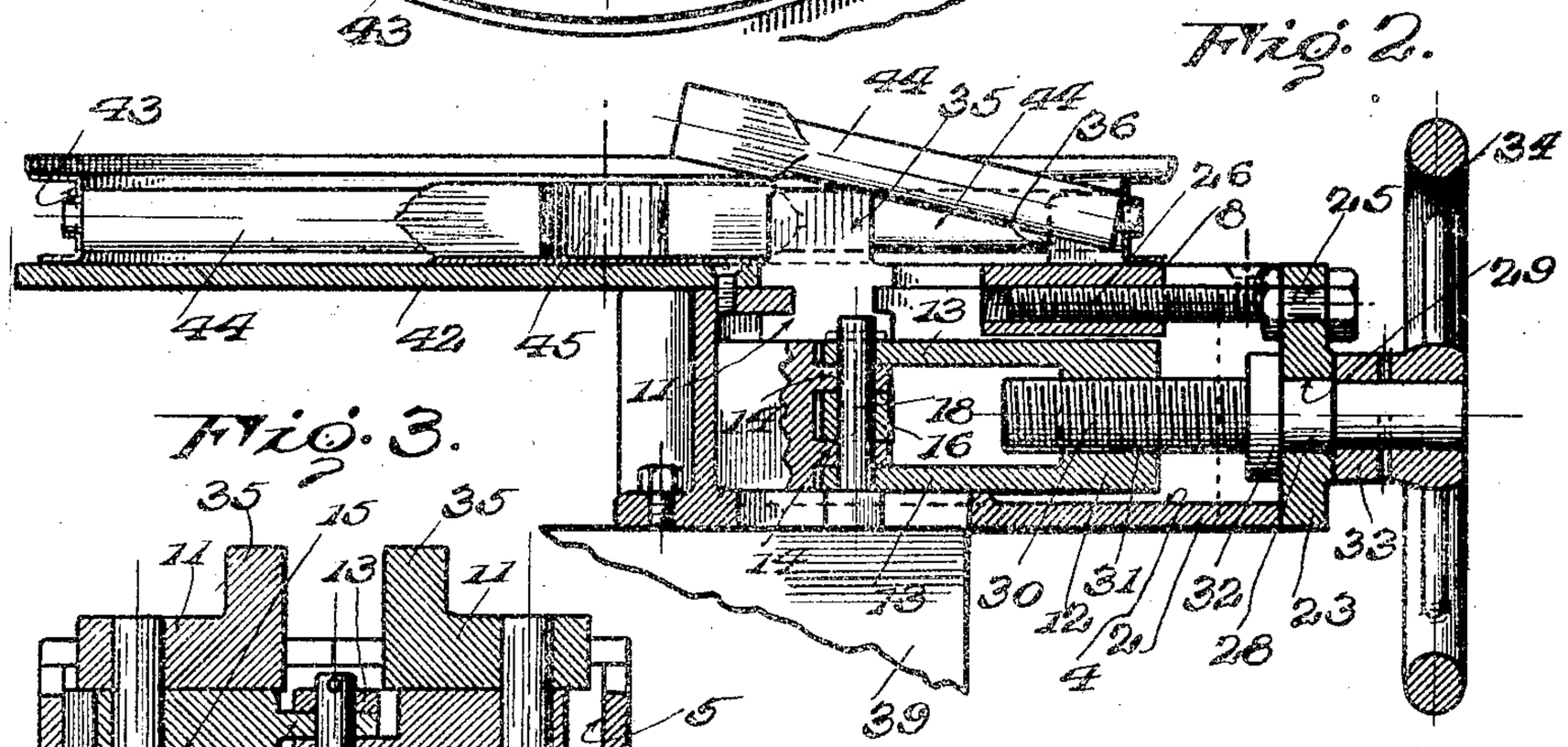

Fig. 3.

Witnesses:
W. A. Williams

INVENTOR
BY J. E. Broxon.
Munn & Co
ATTORNEYS.

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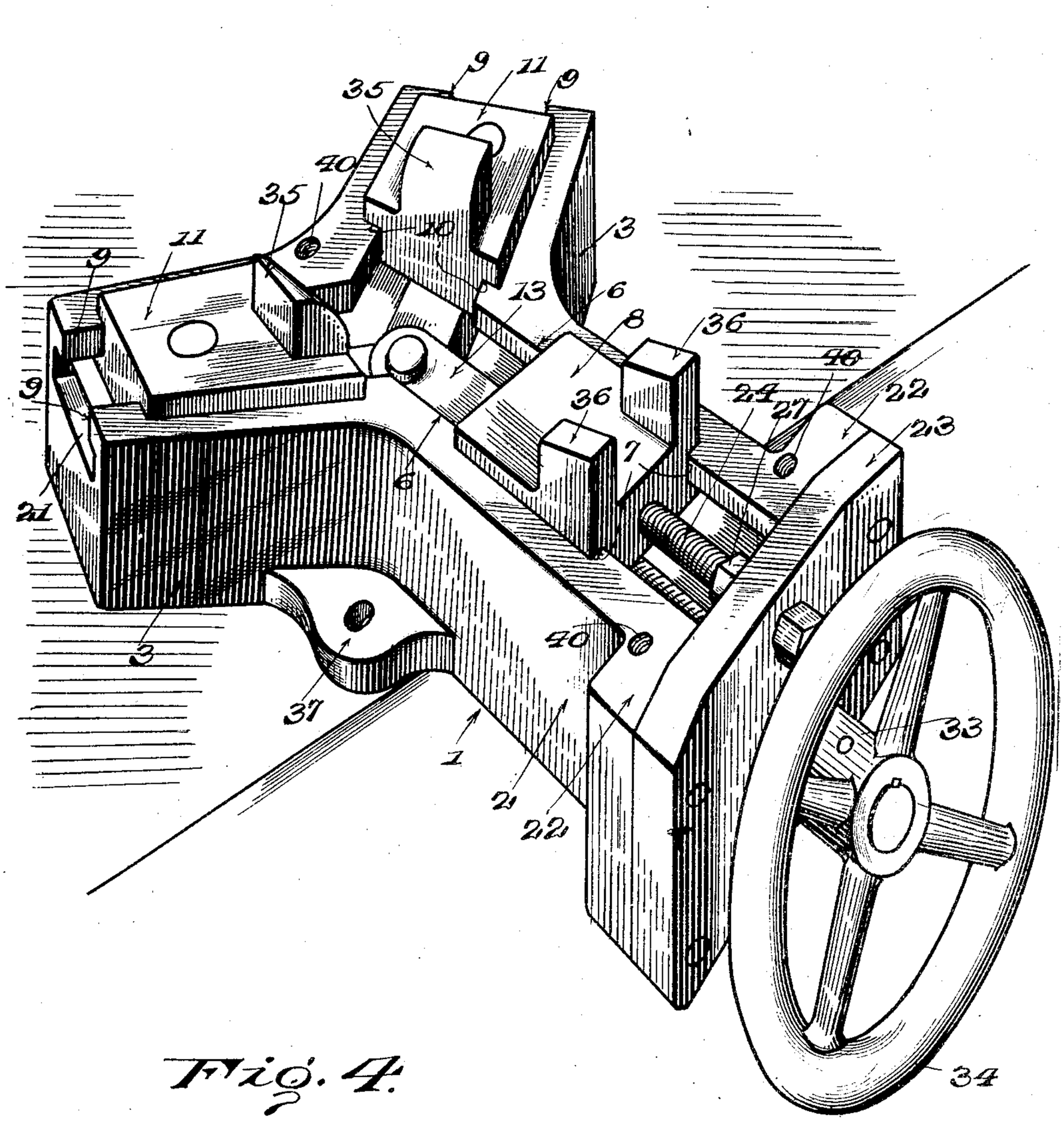

Fig. 4.

Witnesses:
W. A. Williams.

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Patented Nov. 18, 1924. 1,516,328

UNITED STATES PATENT OFFICE.

JAMES E. BROXON, OF AKRON, OHIO.

MACHINE FOR ASSEMBLING SPOKES IN WHEELS.

Application filed October 11, 1922. Serial No. 593,792.

To all whom it may concern:

Be it known that I, JAMES E. BROXON, a citizen of the United States, and resident of Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Machines for Assembling Spokes in Wheels, of which the following is a specification.

My invention relates to devices for use in assembling spoked wheels and it consists in the combinations, constructions and arrangements herein described and claimed.

An object of my invention is to provide a device which is relatively simple in construction and which is adapted to be operated easily to effect the assembly of spokes in a wheel having a continuous steel felloe without likelihood of breaking the spokes or placing any undue strain on the spokes or other parts of the wheel.

A further object of my invention is to provide a device of the character described which affords facilities for assembling the spokes in wheels without there being any necessity of heating the felloe member of the wheel.

Other objects and advantages of the invention will be apparent from the following description, taken in conjunction with the accompanying drawings, in which—

Figure 1 is a plan view showing the device embodying the invention supported upon a table and in an adjusted position in respect to the spokes and rim member of a wheel,

Figure 2 is a central vertical section through the structure shown in Figure 1,

Figure 3 is a section through the device in detached position, the view being taken along the line 3—3 of Figure 1, and

Figure 4 is a relatively enlarged perspective view, showing the device attached and with the cover plate thereof omitted.

In carrying out my invention, I provide a frame or body which is substantially Y-shaped in plan and includes a stem portion 2 merged at its one end into a pair of divergent branches. The stem 2 and the branches 3 have substantially flat upper faces lying in the same plane. A way or channel 4 extending longitudinally of the stem 2 in the upper face thereof is in open communication at one end with channels 5—5 which extend in the upper faces of the branches 3 longitudinally of the latter for the entire length thereof. Flanges 6—6 extend inwardly from the side of the channel 4 along the upper edges thereof and constitute retaining guides for sliding engagement with grooves 7—7 in the opposite sides of a block 8 which is thus mounted for reciprocation or slidable movement in the channel or groove 4.

Each of the channels 5 is provided with a pair of inwardly extending flanges 9—9 along the upper edges of the side walls thereof and these flanges likewise constitute retaining guides for engaging grooves 10—10 in opposite sides of each of a pair of carrying blocks 11—11 which are thus mounted to slide along the channels 5—5.

The channels 4 and 5—5 are relatively deep and wide, as best seen in Figures 2 and 3. A traveller 12 is mounted for reciprocation in the channel 4 below the level of the carrying block 8. The traveller 12 is provided with a pair of vertically spaced arms 13—13 which extend within the channel 4 toward the channels 5—5 and are disposed at their outer ends in straddling relation to a pair of vertically spaced lugs or ears 14 which are integral with a connecting block 15 underlying one of the carrying blocks 11. A lug or ear 16 integral with a second connecting block is interposed between the spaced ears or lugs 14—14. A pivot pin 18 extends through vertically aligned openings provided in the superposed arms 13—13, ears or lugs 14—14, and ear or lug 16 to connect these parts together.

The connecting block 15 extends longitudinally of one of the channels 5 for part of the length of the latter and is connected by a pivot pin 19 to the superimposed carrying block 11. The connecting block 17 extends longitudinally of the other channel 5 and is connected by a pivot pin 20 with the overlying carrying block 11.

With the organization described, a toggle joint is provided between the carrying blocks 11—11 and the traveller 12 so that the carrying blocks 11—11 will be moved apart or toward the outer ends of the branches 3—3 when the traveller 12 is moved within the channel 4 toward the end of the latter in communication with the channels 5—5. Upon reversal of direction of movement of the traveller 12, the carrying blocks 11—11 will be drawn toward each other or moved toward the inner ends of the channels 5—5.

Stops for limiting movements of the

carrying blocks 11—11 apart may have the form of ends 21—21 integral with the sides and bottom walls of the channels 5—5 at the outer ends of the latter and terminating at their upper ends below the plane of the lower sides of the carrying blocks 11—11, whereby the latter may be removed from the channels 5—5 when disconnected from the connecting blocks 15 and 17 but are held against movement from the outer ends of the branches 3—3 because of the engagement of the connecting blocks with the ends 21—21 when the carrying blocks 11—11 are attached to the connecting blocks in the manner described.

The stem 2 is provided at its end remote from the branches 3—3 with laterally extending flanges or lugs 22 having bolt receiving openings therethrough adapted for alignment with the bolt receiving openings through a head 23, whereby the latter may be secured to the stem 2 in closing relation to the one end of the channel 4. An adjusting bolt 24 is loosely extended through an opening 25 in the head 23 and threadedly engages the walls of a bore 26 extending longitudinally through the carrying block 8. The head of the adjusting bolt 24 is in abutting relation to the outer face of the head 23 and the adjusting bolt 24 may be locked against turning movement through the agency of a jam nut 27 disposed on the bolt between the carrying block 8 and the inner face 23 and adapted to be screwed tight against the latter, whereby the carrying block 8 may be secured in various adjusted positions along the length of the channel 4, for a purpose which will be hereinafter set forth.

The means provided by my invention in the form now preferred by me for reciprocating the traveller 12 in the channel 4 comprises a rod 28 extending through an opening 29 in the head 23 and being adapted to rotate in the opening 29. The rod 28 is provided with a threaded or screw portion 30 extending within the channel 4 in threaded engagement with a bore 31 extending longitudinally through the traveller 12. The rod 28 is held against axial movement by a collar 32 fixed thereon in abutting relation to the inner face of the head 23 and a sleeve 33 secured to an outer end portion of the rod 28 in abutting relation to the outer face of the head 23. The sleeve 33 may be the hub of a hand wheel 34 which is provided for rotating the rod 28 at will to effect reciprocation of the traveller 12. As illustrated to advantage in Figure 4, the blocks 11—11 are provided with integral upstanding projections 35—35 at their inner or adjacent ends, which lugs or projections constitute presser elements. The carrying block 8 likewise has presser elements upstanding therefrom in the form of a pair of spaced integral lugs 36 upstanding therefrom at the end remote from the branches 3—3. The remote sides of the presser lugs 35—35 extend in vertical planes and at right angles to the plane of the upper faces of the carrying blocks 11—11. The sides of the presser lugs 35—35 remote from the branches 3—3 likewise lie in a vertical plane.

The body 1 is provided with laterally extending ears or flanges 37 at its lower edge intermediate of its length, which ears or flanges have openings therethrough, whereby the body 1 may be secured by means of bolts 38 to a table 39 or like supporting structure. The body 1 also is provided with a plurality of spaced sockets 40 in the upper face thereof adapted for threaded engagement with bolts or screws 41 projected through openings in the cover plate 42. The cover plate 42 is suitably apertured to receive the presser lugs 35—35 and 36—36 which project above the plane of the cover plate and to permit longitudinal movements of the carrying block 8 and the carrying blocks 11 in the channels 4 and 5—5 respectively. The cover plate 42 extends beyond the outer walls of the branches 3—3 and constitutes a rest upon which the parts which are to be assembled may be disposed as will presently appear.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. In Figures 1 and 2, I show the rim member 43 of a wheel resting upon the cover plate 42 and all except one of the spokes 4 of the wheel in assembled position between the inner felloe of the rim and a hub 45 which is supported upon the cover plate substantially in concentric relation to the rim member. It will be understood that the spokes 44 which are in assembled relation in Figures 1 and 2 may be placed in the positions in which illustrated by hand readily and without any appreciable pressure being applied against the inner felloe or the hub, since these spokes are not yet in true radial set positions or at least the spokes adjacent to the one which has not yet been set will diverge slightly from their outer ends toward their inner ends from the radial positions which these spokes will occupy when all spokes of the wheel are in assembled or set position. The one spoke which has not yet been set is shown in Figures 1 and 2 as being in engagement at its outer end with the rim member 43 and as being inclined toward its inner end from the plane of the remaining spokes so that the inner end thereof lies above the position between the spokes adjacent thereto which the one spoke will occupy when in set position. In order to position the inclined spoke in set position between the hub 45 and the rim 43 pressure is applied to the spokes at opposite sides of the inclined spoke and against

the inner felloe at the outer end of the inclined spoke simultaneously to cause enlargement of the space extending between the inner wall of the portion of the rim and the portion of the hub intercepted by such adjacent spokes so that the inclined spoke may be arranged in the plane of the remaining spokes and with the inner end thereof in engagement with the usual groove or socket in the periphery of the hub 45. The pressure against the adjacent spokes and the felloe of the rim is then removed and as a result of the consequent contraction or decrease in area of the space between the adjacent spokes and the intercepted sections of the rim and hub all the spokes of the wheel will be securely held in spaced relation between the hub and the rim.

In the embodiment of the invention illustrated, the lugs 35 abut the inner sides of the spokes adjacent to the inclined spoke and the lugs 36 are in abutting relation to the inner felloe at the outer end of the inclined spoke and at opposite sides of the latter. By turning the hand wheel 34 in one direction, the carrying blocks 11—11 are expanded or moved apart and pressure is thus applied against the spokes at opposite sides of the inner end of the inclined spoke and against the felloe at the outer end of the inclined spoke.

Upon reversal of direction of rotation of the hand wheel after the inclined spoke has been placed in a desired position, the carrying blocks 11—11 will be moved inwardly or toward each other and the pressure imposed on the spokes and on the felloe removed.

The carrying block 8 may be adjusted longitudinally of the stem 2 to adapt the device for use with rim members of various diameters.

In accomplishing the assembly of the spokes in the manner described, the rim member 43 may be heated in any suitable known manner, although heating of the rim in order to effect assembly of the spokes is not essential in the operation of the device embodying my invention.

I claim:—

1. A machine for use in assembling spokes in wheels comprising means for supporting a wheel, and means reacting against said supporting means for imposing lateral pressure upon spaced spokes of the wheel and radial pressure upon the felloe of the wheel, as and for the purpose set forth.

2. A machine for use in assembling spokes in wheels having continuous steel felloes comprising means for supporting a wheel in which a spoke is to be set, and laterally expansible means reacting against said supporting means for imposing pressure against the proximate sides of spokes defining the space in which a spoke is to be set.

3. A machine for use in assembling spokes in wheels having continuous steel felloes comprising structure adapted to support a wheel, expansible presser elements reacting against said structure for exerting lateral pressure on the proximate sides of spaced apart spokes of the wheel and radial pressure on the felloe of the wheel, and means for operating said expansible presser means.

4. A machine for use in assembling spokes in wheels comprising a frame substantially Y-shaped in plan and having diverging branches at one end thereof, said frame being adapted to support a wheel, expansible means carried by the frame for engaging the inner felloe and spaced apart spokes of the wheel simultaneously and means for operating said expansible means to exert pressure against the inner felloe and the said spokes, as and for the purpose set forth.

5. A machine for use in assembling spokes in wheels comprising a frame, a pair of presser elements movably supported thereon, a reciprocable member carried by the frame, a toggle joint connection between said reciprocable member and the presser elements, other presser means supported upon the frame equi-distant from the first named presser elements, and means for operating the reciprocable member.

6. A machine for use in assembling spokes in wheels comprising a frame comprising a stem having divergent branches at one end, means for supporting a wheel upon the frame, presser elements supported for movement longitudinally of said branches and adapted for engagement with the proximate side walls of spaced apart spokes of the wheel, other presser means carried by the frame equi-distant from the first named presser means and adapted to engage with the inner felloe of the wheel, spokes of which are engaged by the first named presser elements, and means carried by the frame for moving the first named presser elements apart or toward each other at will.

7. A machine for use in assembling spokes in wheels, said frame being substantially Y-shaped and including a stem portion merging at one end into divergent branches, presser elements supported upon said branches for movement longitudinally of the latter, presser means adjustably mounted upon said stem portion, and means carried by said frame for moving said first named presser elements apart or toward each other at will, as and for the purpose set forth.

JAMES E. BROXON.