No. 698,189. Patented Apr. 22, 1902.

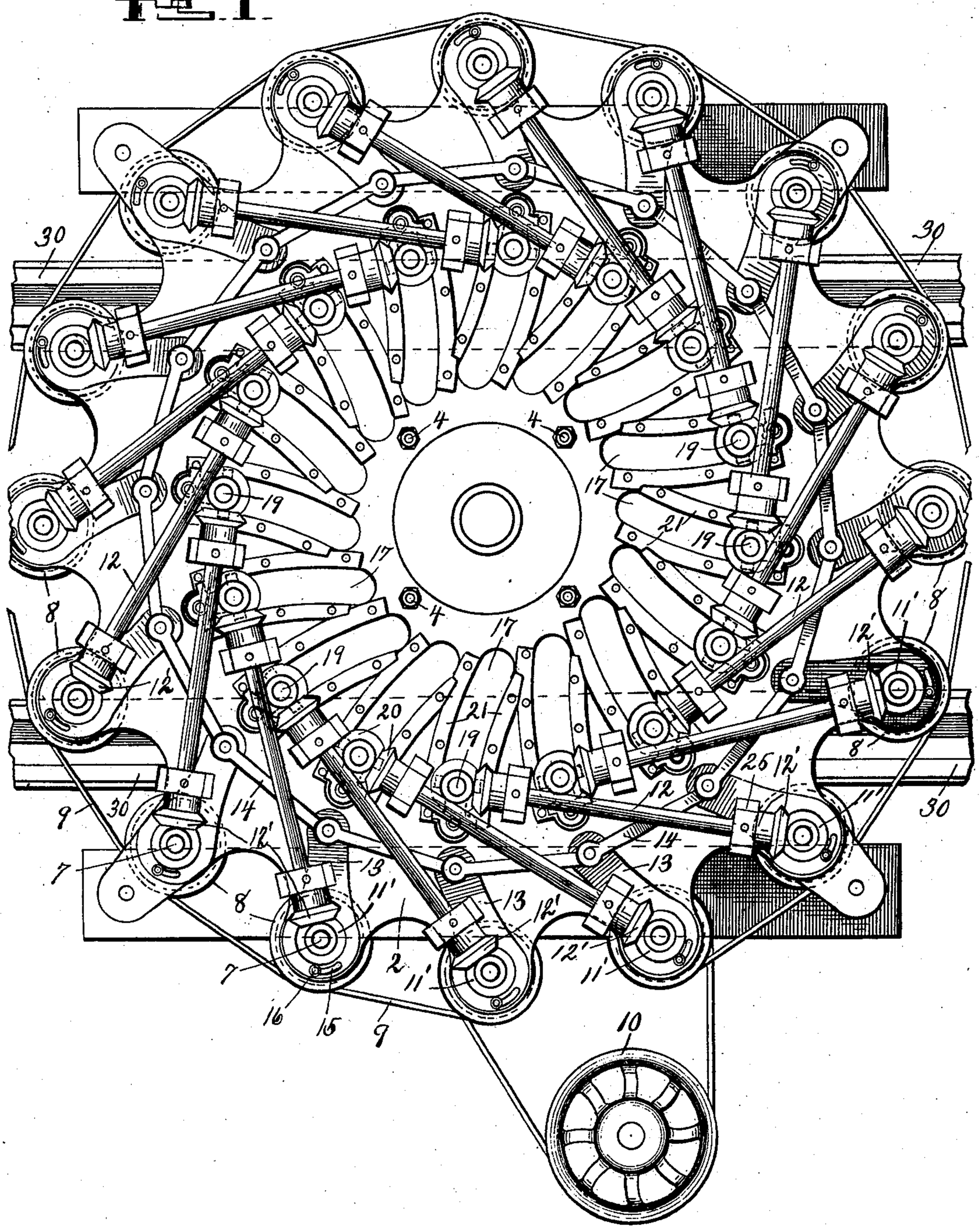
G. H. EVERSON.

MACHINE FOR DRILLING RIVET HOLES IN METALLIC WHEEL FELLIES.

(Application filed May 20, 1901.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



WITNESSES.

L. R. Keller

Alex. D. Mabon.

INVENTOR.

Geo. H. Everson

By Jno. Kesbit

Atty.

No. 698,189. Patented Apr. 22, 1902.

G. H. EVERSON.

MACHINE FOR DRILLING RIVET HOLES IN METALLIC WHEEL FELLIES.

(Application filed May 20, 1901.)

(No Model.) 3 Sheets—Sheet 2.

Fig. 2.

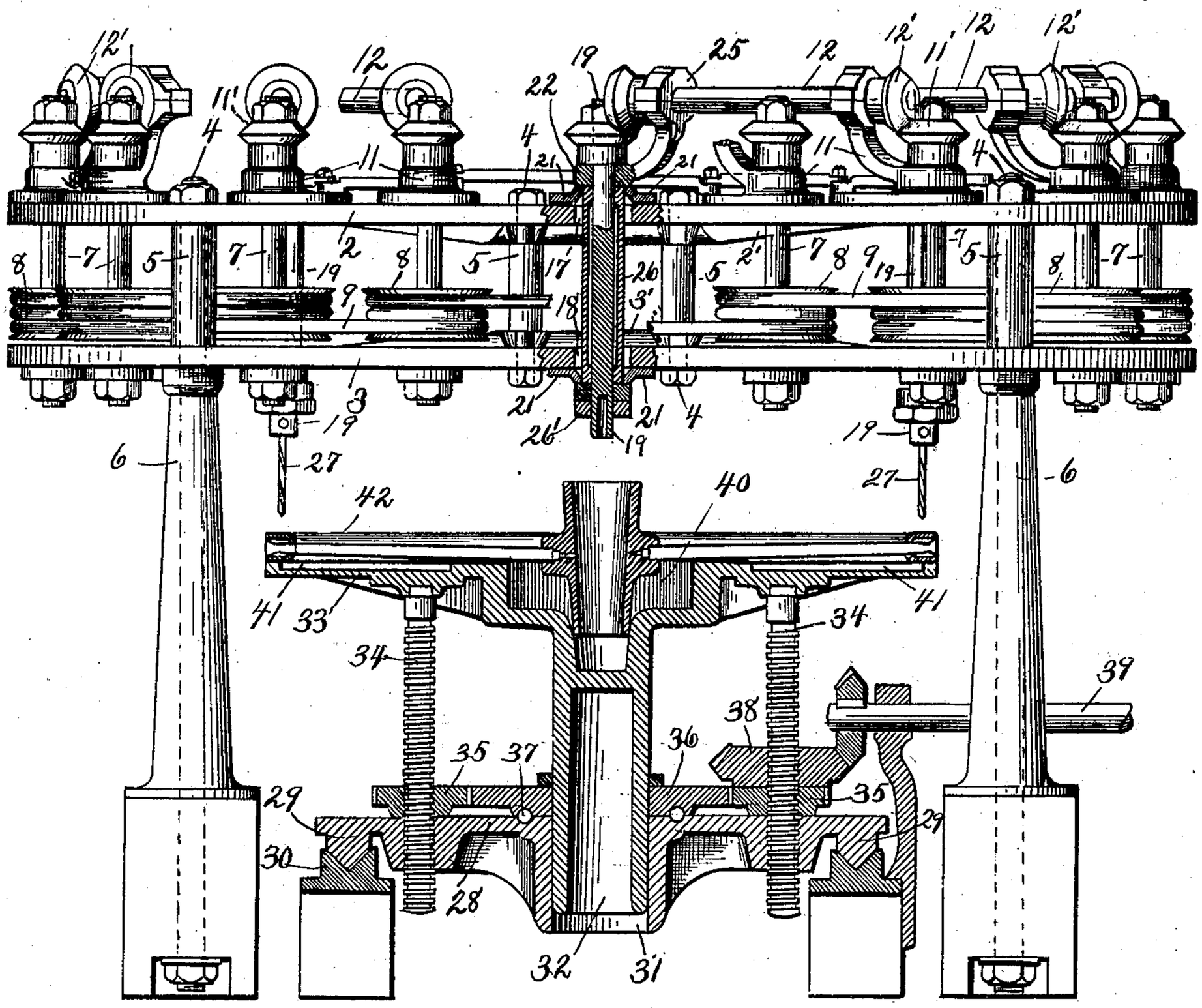
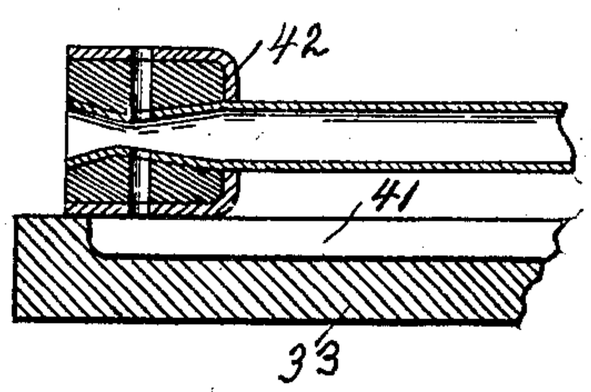


Fig. 8.



WITNESSES.
J. R. Keller.
Alex. D. Mabon.

INVENTOR
Geo. H. Everson.
By Jno. Meakin
Atty.

No. 698,189. Patented Apr. 22, 1902.

G. H. EVERSON.

MACHINE FOR DRILLING RIVET HOLES IN METALLIC WHEEL FELLIES.

(Application filed May 20, 1901.)

(No Model.) 3 Sheets—Sheet 3.

FIG. 3.

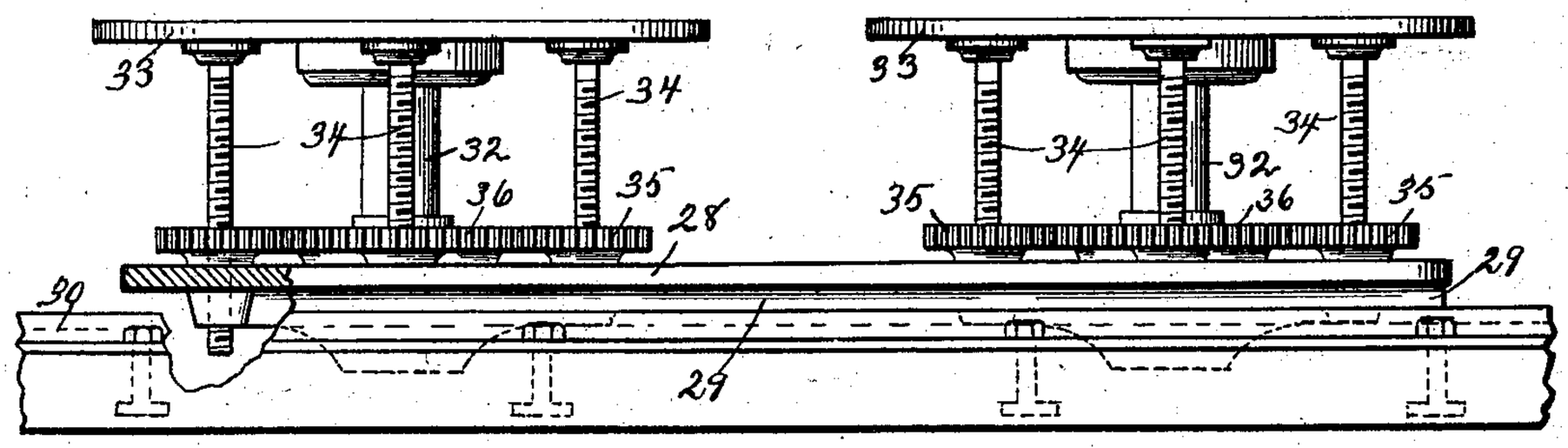
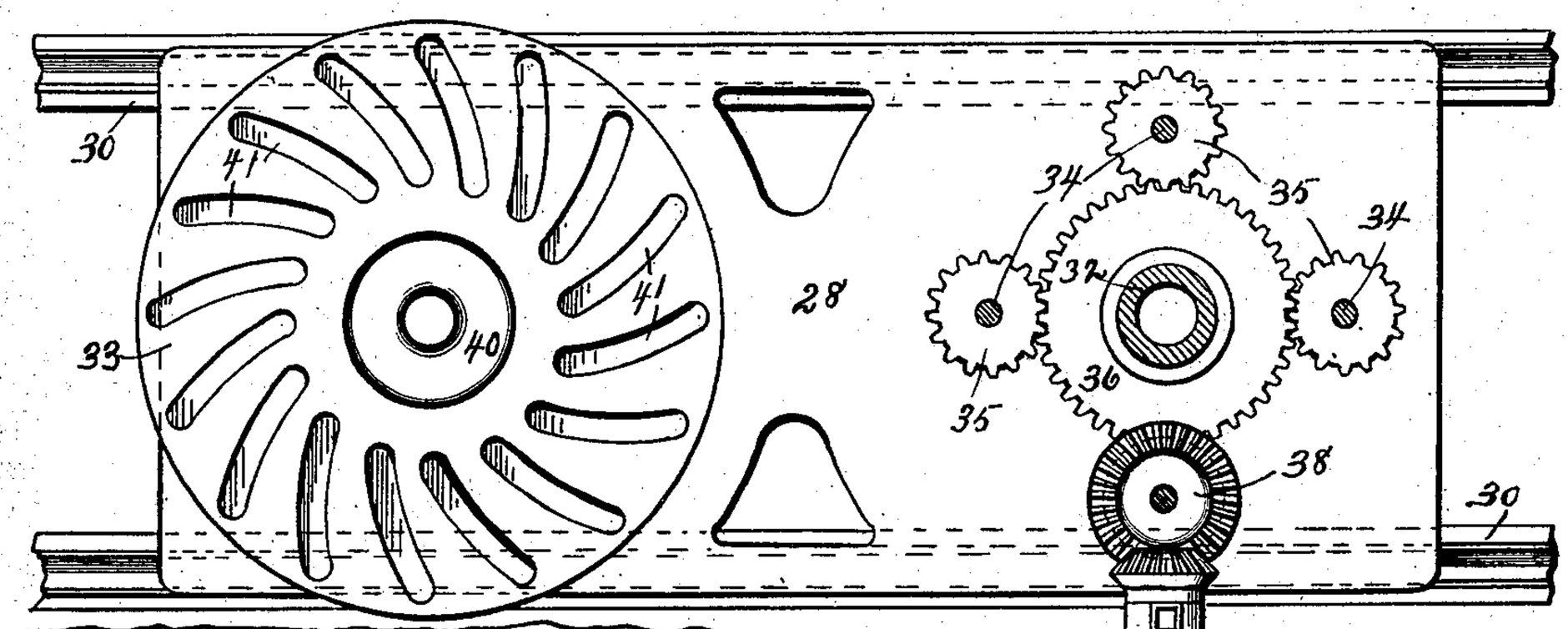


FIG. 4.



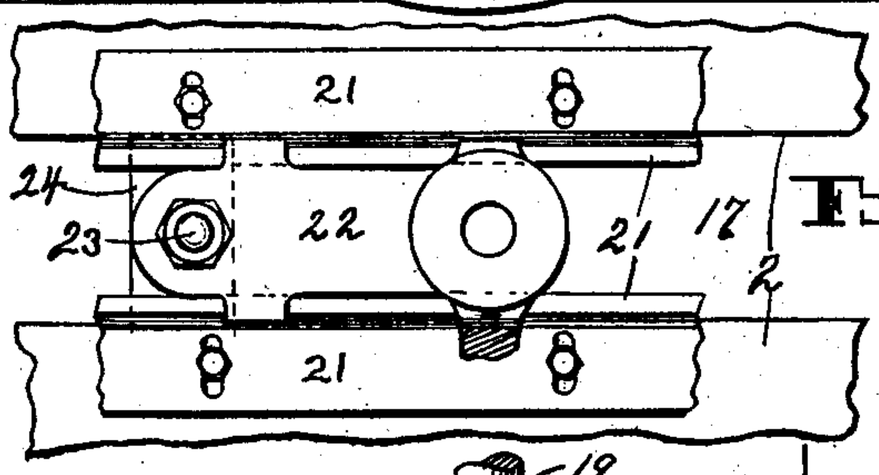


FIG. 5.

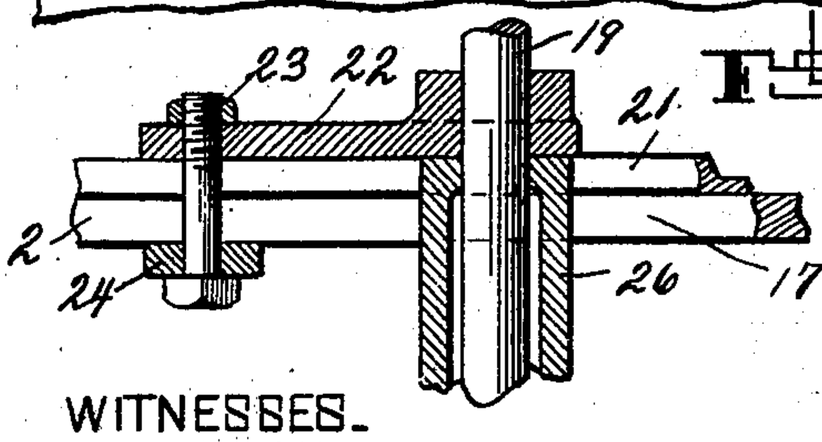


FIG. 6.

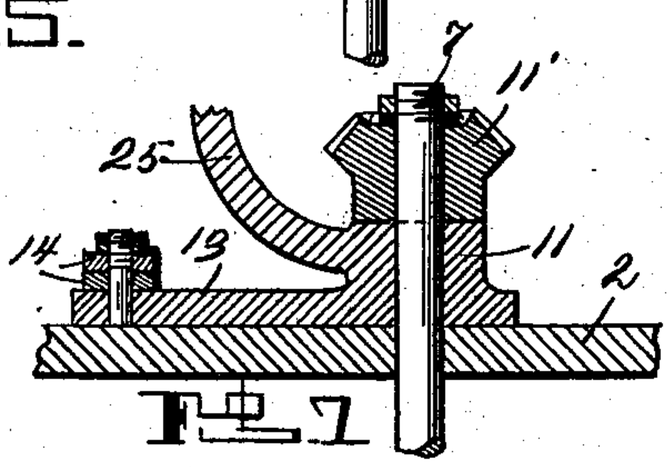


FIG. 7.

WITNESSES.

J. R. Keller

Alex. D. Mabon.

INVENTOR.

Geo. H. Everson,

By Jno. Herbert

Atty.

UNITED STATES PATENT OFFICE.

GEORGE H. EVERSON, OF PITTSBURG, PENNSYLVANIA.

MACHINE FOR DRILLING RIVET-HOLES IN METALLIC WHEEL-FELLIES.

SPECIFICATION forming part of Letters Patent No. 698,189, dated April 22, 1902.

Application filed May 20, 1901. Serial No. 61,167. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. EVERSON, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Drilling Rivet-Holes in Metallic Wheel-Fellies, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a machine for drilling holes in wheel rims or fellies for the reception of rivets, which secure the spokes therein.

The primary object of the invention is to provide a machine for drilling all of the rivet-holes simultaneously and also a machine in which the drills may be adjusted with exact uniformity for drilling wheels of various sizes.

Still a further object of the invention is to provide improved means for sustaining the work and for moving it toward and away from the drills.

The invention consists in the novel features of construction and in the combination and arrangement of parts hereinafter fully described and claimed, and illustrated by the accompanying drawings, wherein—

Figure 1 is a top plan view of my improved machine. Fig. 2 is a view of the same, shown partly in elevation and partly in section. Fig. 3 is a similar view of the wheel-support. Fig. 4 is a plan view of the wheel-supporting mechanism, one of the supporting-tables being removed to illustrate the actuating-gearing. Figs. 5, 6, and 7 are detail views illustrating the radial adjustment of the drill-spindles. Fig. 8 is a sectional view of a portion of a wheel-rim drilled with my improved machine.

In the present embodiment of my invention the machine-frame consists, primarily, of the horizontal circular plates 2 and 3, arranged one above the other. These plates are rigidly united by bolts 4 and are spaced apart by sleeves 5, through which said bolts extend, and the plates thus united are supported on posts 6. Journaled in these plates, adjacent the peripheries thereof, is a circular series of vertical shafts 7, which are spaced apart uniformly and provided each with a rope-sheave 8, and all of the sheaves are encircled by the continuous rope belt 9, which may be driven by a suitably-arranged power-wheel 10. By this means all of shafts 7 are driven simultaneously and at an absolutely uniform rate of speed. Shafts 7 project upward through plate 2 and form centers for the bearing-brackets 11, and journaled at their outer ends in these brackets are shafts 12, carrying beveled pinions 12′ at their outer extremities, which mesh with the beveled pinion 11′ on the upper extremities of shafts 7. Projecting inward from each of brackets 11 over the top face of plate 2 is an arm 13, and all of these arms are connected by the circular series of links 14. By means of this construction it will be seen that it is impossible to turn one of bearing-brackets 11 upon its center without correspondingly turning all of said brackets. Thus the position of all of said brackets and of shafts 12, carried thereby, may be determined and fixed by a single operation, with the inner operative ends of all of said shafts at exactly the same distance from the center of plate 2. Each of brackets 11 may be slotted at 15 to move over a clamping-screw 16 for rigidly fixing it to plate 2.

Plates 2 and 3 are formed, respectively, with the corresponding series of segmental slots or openings 17 and 18. Corresponding slots 17 and 18 form ways for the depending drill-spindles 19, which are actuated by shafts 12 through the medium of beveled pinions 20. Thus each of spindles 19 is provided with a way which is curved concentrically to the turning-point—to wit, shaft 7—of its actuating-shaft 12. These curved ways must be very accurately defined, and to avoid tedious and expensive machine-work on frame-plates 2 and 3 the latter are cast with the curved slots or openings, and then the accurately-curved plates 21 are secured adjacent the edges thereof. The central portions of plates 2 and 3 are preferably thickened at 2′ and 3′ to provide sufficient strength in view of the close proximity of the inner portions of the curved openings, which otherwise would materially weaken the frame-plates.

The upper end of each of spindles 19 is journaled in a slide 22, which bears flatly on the uppermost guide-plates 21, and adapted to be clamped thereto by bolt 23 and clamping-plate 24 on the under side of frame-plate 2, as clearly shown in Figs. 5 and 6. Formed

integral with bearing-plate 22 is the upwardly-curved bearing 25 for the inner end of shaft 12. An elongated sleeve 26 serves to center spindle 19 in passages 17 and 18 and between the plates 21 and is held in place at its lower end by nut 26'. After the drilling-spindles have been adjusted so that the circle thereof corresponds with the work in hand each of bearing-plates 22 is clamped, thus separately securing each of the spindles and holding its bearing absolutely rigid. It will of course be understood that before the spindles can be adjusted as above described it is necessary to release the clamping devices operating on bearing-plates 22 and bearings 11.

As the drill-spindles 19 and the drills 27 depending therefrom are not adjustable longitudinally, it is necessary to feed the work thereto as the drilling progresses. The vertically-adjustable work-support is here shown, consisting of an elongated carriage 28, provided with longitudinal runners 29, which move in the grooved tracks 30. Carriage 28 is centrally apertured at 31 to receive the posts 32, which depend centrally from the annular work-supports 33. Each of these supports is secured on the upper ends of four screw-shafts 34, which extend downward through openings in carriage 28 and through pinions 35, arranged on the upper face of the carriage. These pinions mesh with the large central gear 36, having ball-bearing 37 on the carriage and adapted to rotate around post 32. Rotatable with one of pinions 35 is a beveled pinion 38, which is geared to an actuating-shaft 39, having a fixed bearing. By this means all of screw-shafts 34 may be operated upon simultaneously and the support 33 caused to rise or lower, as may be required. The support 33 is centrally recessed at 40 to receive the hub of the wheel being operated upon, and the top surface of the support is formed with depressions 41, which correspond in outline to openings 17 and 18 of frame-plates 2 and 3, whereby drills 27 may be projected through the felly 42 without causing the drills to come in contact with the support.

The carriage 28 is here shown provided with two work-supports, so that when one is beneath the machine and sustaining a wheel being drilled the previously-drilled wheel may be moved from the other support and a fresh wheel positioned thereon, so that when a wheel has been drilled and support 33 lowered to withdraw the wheel from the drills the carriage may be immediately moved and the work proceed upon the wheel placed upon the other support. The necessary position of the work-carriage may be accurately determined, and when moved thereto gear 38 will be in mesh with the actuating-shaft 39, which operates to raise or lower the active support. If desired, provision may be made for moving shaft 39 longitudinally to break the engagement of the gears.

It will be understood that there is a drill-spindle and a depending drill at the inner end of each of shafts 12, so that in the machine shown herein provision is made for sixteen drills for operating on wheels provided with as many spokes. It will be understood, however, that the machine may be constructed with a greater or less number of drills, as wheels of different types and sizes may require. In Fig. 2 only three of the drill-spindles have been shown to avoid confusion in illustrating the other portions of the machine.

With a machine of this character the work may be done rapidly and with absolute uniformity, and the wide range of adjustment brings many different sizes of wheels within the scope of the machine. While the machine is designed, primarily, for use in the manufacture of metallic wheels of the character shown in my application for patent filed April 19, 1901, Serial No. 56,575, its use is by no means restricted thereto.

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

1. The combination of a frame formed with a circular series of correspondingly-curved guiding-slots, drills journaled in bearings in said slots, shafts journaled at one end in said bearings and geared to the drills, a circular series of individually-rotatable bearings mounted on the frame outside of the circular series of slots, the shafts being also journaled in said latter bearings, an arm projecting from each of the individually-rotatable bearings, and links connecting the arms of adjacent bearings throughout the circular series, whereby all of said bearings and the shafts journaled therein may be adjusted simultaneously, substantially as shown and described.

2. The combination of a circular series of drills, a corresponding series of shafts disposed at right angles to the drills, the shafts being geared at their inner ends to the drills, a circular series of bearings for the outer ends of said shafts, and means for axially turning said bearings simultaneously for the purpose of so moving said shafts as to either increase or diminish the diameter of the circle of said drills, substantially as shown and described.

3. The combination of a circular series of drills, a corresponding series of shafts extending at right angles to the drills, said shafts being geared at their inner ends to the drills, bearings common to said shafts and drills for constantly maintaining them in proper relation, a circular series of revoluble bearings for the outer ends of said shafts, and means for axially turning said revoluble bearings, substantially as shown and described.

4. The combination of a circular series of drills, a corresponding series of shafts extending at right angles thereto, the drills being geared to the inner end of said shafts and adjustable therewith, a circular series of bearings for the outer ends of the shafts, an arm projecting from each of said bearings, and

links connecting all of said arms, whereby all of the bearings may be turned on their axes uniformly for the purpose of increasing or diminishing the diameter of the circle of said drills through the medium of said shafts, substantially as shown and described.

5. The combination of a circular series of radially-adjustable drills, actuating mechanism for each drill having permanent operative engagement therewith, a circular series of individually-turning supports—one for each of said actuating mechanisms, whereby the latter and the drills are adapted to swing in a common plane, and means for turning all said supports simultaneously, substantially as shown and described.

6. The combination of a series of horizontally-swinging drills, the centers upon which the drills swing being arranged in a circle, and adjusting mechanism common to the swinging centers of all the drills, substantially as shown and described.

7. The combination of a frame formed with a circular series of correspondingly-curved slots, bearings fitting the slots and adjustable therein, drills mounted in the bearings, and mechanism for radially adjusting all of said bearings, simultaneously, substantially as shown and described.

8. The combination of vertically-disposed drills, a vertically-fixed horizontally-movable carriage beneath the drills, and work-supports on the carriage and vertically adjustable independently of each other, whereby work on one support may be raised and operated upon independently of the other support, substantially as shown and described.

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

GEORGE H. EVERSON.

Witnesses:
J. M. NESBIT,
ALEX. S. MABON.