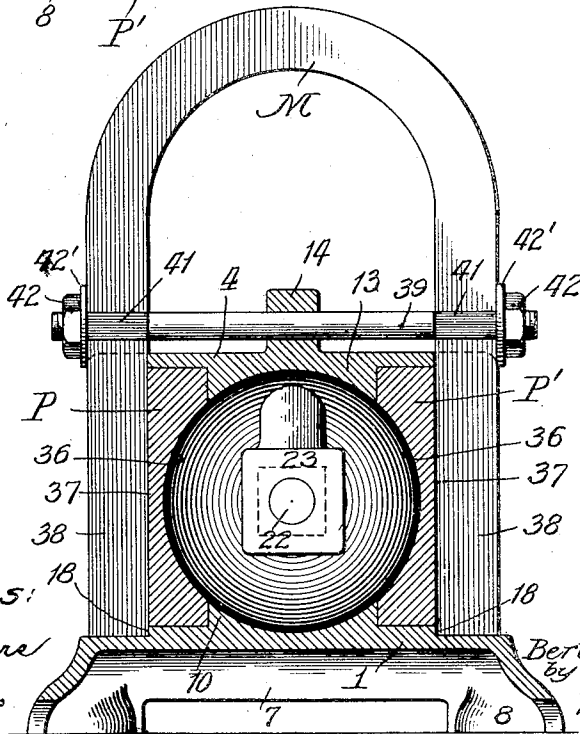
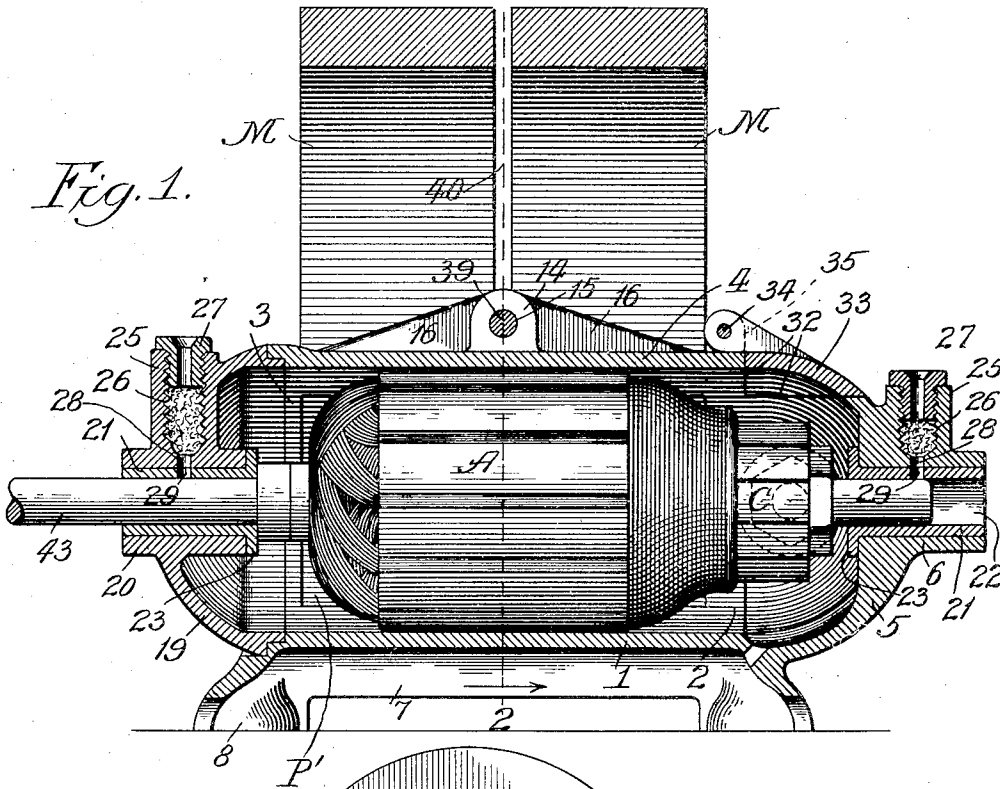


B. WHELCHER.
MAGNETO CONSTRUCTION.
APPLICATION FILED MAY 12, 1911.

1,050,503.

Patented Jan. 14, 1913.

2 SHEETS-SHEET 1.



Witnesses:
John Enders
A. G. Thomas

Inventor:

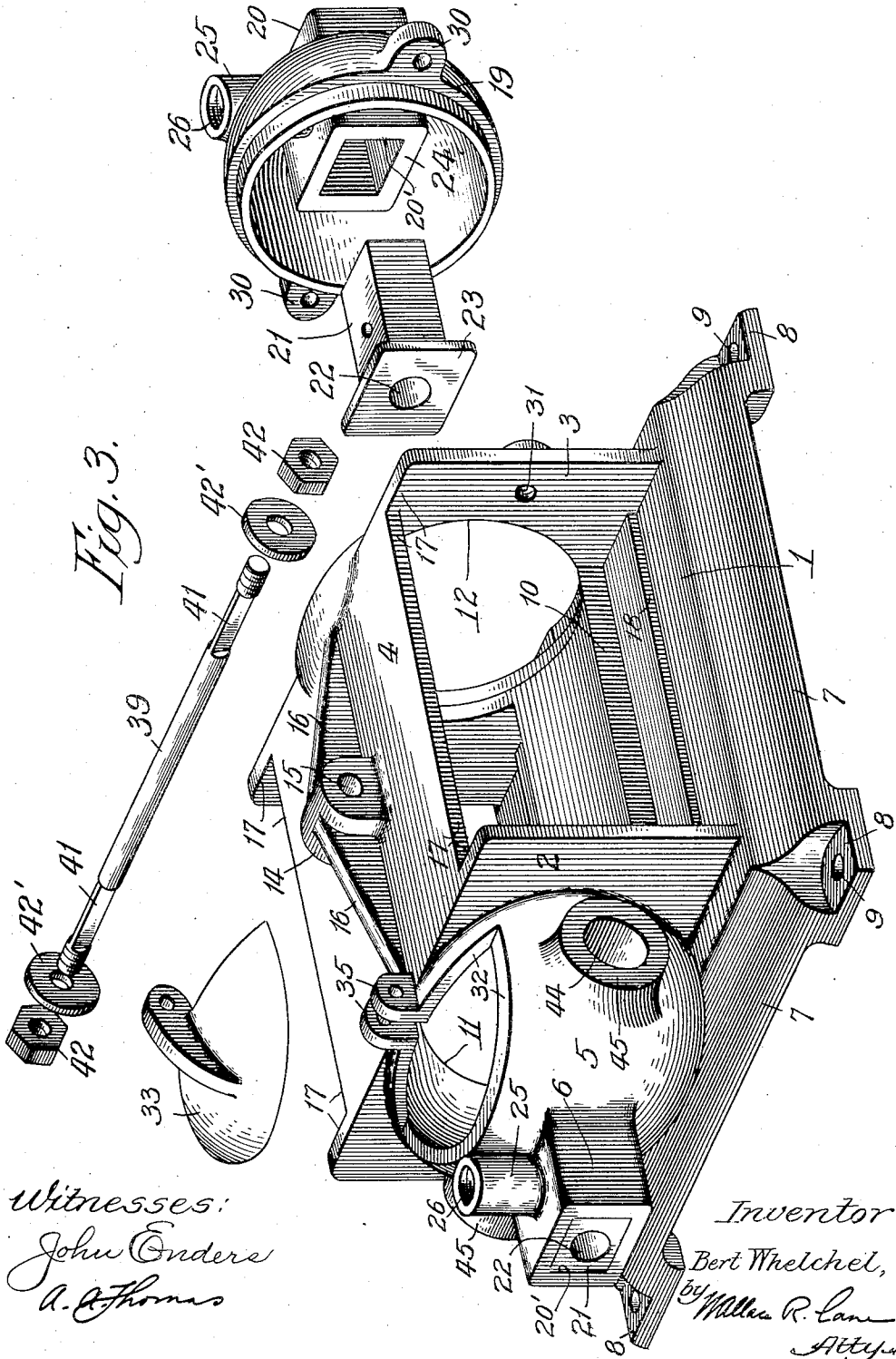
Bert Whelcher,
by
William R. Lane
Attorney

B. WHELCHER.
MAGNETO CONSTRUCTION.
APPLICATION FILED MAY 12, 1911.

1,050,503.

Patented Jan. 14, 1913.

2 SHEETS-SHEET 2.



Witnesses:
John Enders
A. A. Thomas

Inventor:
Bert Whelcher,
by *William R. Lane*
Attorney

UNITED STATES PATENT OFFICE.

BERT WHELCHER, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO A. C. AYRES, OF INDIANAPOLIS, INDIANA.

MAGNETO CONSTRUCTION.

1,050,503.

Specification of Letters Patent.

Patented Jan. 14, 1913.

Application filed May 12, 1911. Serial No. 626,874.

To all whom it may concern:

Be it known that I, BERT WHELCHER, a citizen of the United States, residing at Indianapolis, county of Marion, and State of Indiana, have invented a new and useful Improvement in Magneto Constructions, of which the following is a specification.

My invention relates to magneto constructions and has for its object the provision of a magneto of simple and compact construction in which the various parts are rigidly held in operative relation to each other without danger of disarrangement.

One feature of my invention resides in a frame-work consisting of a single casting comprising a base plate, a pair of end plates, a top plate connecting the end plates, and a bearing housing formed on one of the end plates.

Another feature of my invention consists in so supporting the field magnets on the frame-work that they are firmly held in contact with the iron pole pieces, the magnets being entirely free from mutilation by any retaining devices.

Another feature of my invention consists in providing a removable bearing bushing for the armature shaft so that, when the armature bearings become worn, they may be readily replaced by new bearings without the necessity of replacing other portions of the frame-work.

The above and other features of my invention will become apparent from a detailed description of the accompanying drawings, in which—

Figure 1 is a longitudinal cross-section of a magneto embodying my invention, Fig. 2 is a transverse cross-sectional view on line 2—2 of Fig. 1, and Fig. 3 is a perspective view of the casting and the associated parts, these parts being shown disassembled for the sake of clearness.

The body of the frame-work consists of a single casting, of non-magnetic material, such as brass, and comprises a base plate 1, a pair of end plates 2 and 3 and a top plate 4. One of the end plates (in this instance the end plate 2) has formed thereon the integral housing 5, which is shown as substantially hemi-spherical in form. This housing is provided with a bearing portion 6. The base plate 1 has downwardly extending flanges 7 formed thereon, which terminate at the corners in supporting lugs 8. These lugs

are preferably provided with perforations 9 for receiving fastening devices by means of which the magneto is rigidly secured to a suitable support. The base plate 1 is at its center provided with an upwardly extending portion 10, the surface of which is concentric with the openings 11 and 12 in the end plates 2 and 3. The top plate 4 is provided with a downwardly projecting portion 13, which is diametrically opposite to the upwardly projecting portion 10. The surfaces of the projecting portions 10 and 13 are concentric, as best shown in Fig. 2. The top plate 4 is, on its upper surface, provided with an integral lug 14 having a perforation 15 for receiving a retaining pin to be hereinafter referred to. If desired, strengthening ribs 16 may be formed on the top plate for reinforcing the lug. It will be observed from Fig. 3 that the outer edges of the end plates 2 and 3 project at each side beyond the top plate 4, so as to form recesses 17 into which the field magnets extend, as will presently appear. The base plate 1 is provided with a pair of longitudinal shoulders 18 which are substantially in vertical alinement with the edges of the top plate 4, as shown in Fig. 2. The end plate 3 has attached thereto a housing 19 of substantially the same form as the housing 5, but somewhat smaller. The housing 19 is provided with a bearing portion 20, which is in axial alinement with the bearing portion 6 of the housing 5. The bearing portions 6 and 20 are preferably rectangular in shape so as to be provided with rectangular openings 20' for receiving the removable bearing sleeves or bushings 21. These bushings are provided with an opening 22 for receiving the armature shaft. Each of the bushings 21 is provided at its inner end with a head or enlargement 23, which is adapted to abut against the inner end 24 of the associated bearing portion to limit the inward movement of the bushing. The housings 5 and 19 have each formed thereon an upright projection 25 provided with a screw threaded opening 26 for receiving the plug 27. The openings 26 form oil chambers which communicate with aligned openings 28 and 29 in the bearing portions and bearing bushings, respectively, to feed lubrication to the armature shaft. The housing 19 is rigidly secured to the end plate 3 by means of bolts or screws which pass through the perforated

ears 30 on the housing 19 and the alined perforations 31 in the end plate 3. The housing 5 has a cut-out portion 32 which is covered by a lid 33 hinged at 34 to the lugs 35 formed on the top plate 4. This permits access to the commutator which extends into the housing 5.

The field structure of the magneto comprises a plurality of permanent magnets M substantially U-shaped in form and a pair of pole-pieces P and P' with which the magnets are in contact. The pole-pieces are arranged to fit between the top plate and the base plate, as shown in Fig. 2, and are provided with recessed portions 36 concentric with the surfaces of the projections 10 and 13, so that these polar recesses on the surfaces of the projections form a cylindrical space in which the armature is adapted to rotate. As clearly shown in Fig. 2, the outer sides 37 of the pole pieces are substantially flush with the edges of the top plate 4 and the longitudinal shoulders 18 on the base plate 1. The pole pieces preferably extend from one end plate to the other. The U-shaped magnets M (of which two are shown for the sake of illustration) extend with their legs 38 into the recesses 17 previously referred to, so that the outer edges of the magnets abut against the projecting edges of the end plates 2 and 3. A retaining pin 39 passes through the perforated lug 14 on the top plate 4 and extends between the magnets M, the latter being separated by a space 40. The end portions 41 of the retaining pin 39 are preferably flattened, so that the separating space between the magnets may be reduced as much as possible. The outer ends of the pin 39 are screwthreaded and provided with heads 42, which may be in the shape of nuts. When these nuts or heads are screwed inwardly against the outer faces of the magnets, the latter are rigidly connected to the casting. If desired, disks 45 or washers 42' may be interposed between the nuts 42 and the magnets, so as to secure a larger contact area. The projecting sides of the end walls 2 and 3 positively prevent longitudinal movement of the magnets on the casting, while the retaining pin 39 prevents upward displacement of the magnets with respect to the casting. The lower ends of the magnets M abut against the shoulders 18, as shown in Fig. 2. A firm magnetic contact between the pole-pieces and magnets is thus insured at all times, a necessary requisite for the proper operation of a magneto.

It should be observed that the field magnets are not in any way mutilated to receive the retaining devices. Such mutilation of the magnets necessarily decreases their efficiency. While the magnets are securely held in place on the frame-work, they can, nevertheless, be readily removed by merely loosen-

ing the nuts 42, whereupon the magnets may be withdrawn.

The armature A is of any approved and well-known construction, and I need not, therefore, describe the same here in detail any further than to say that it is a wire-wound armature provided with a commutator C. The armature and commutator are mounted on the shaft 43, which is journaled in the bearing bushings 21. The commutator C extends into the housing 5, and is fully protected from dirt and dust by being completely inclosed. At the same time ready access to the commutator is had by opening the hinged lid 33. The commutator brushes, which may be of any well-known construction, and have not, therefore, been shown in the drawings, are held in the openings 44 of the diametrically opposite projections 45 formed on the housing 5.

My new form of magneto is particularly useful on automobiles, since it takes up comparatively little space and is well adapted to withstand the jars and shocks incident to such use. The magneto is secured to a suitable support on the automobile by means of the lugs 8 at the corners of the base plate. The armature shaft is adapted to be coupled to the engine shaft in any suitable way. As the armature is rotated by the engine, there is developed an electro-motive force in the windings of the armature in a manner well understood by those skilled in the art. The terminals of the sparking circuit are connected to the commutator brushes. I have not deemed it necessary to describe these electrical connections, since they form no part of my invention and are, furthermore, well understood by those skilled in the art.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a magneto construction, a frame consisting of a single casting which comprises a base plate, a pair of end plates similar in outline and provided with axially alined openings, a top plate connecting said end plates, a housing formed on one of said end plates and terminating in a bearing portion, a perforated lug on said top plate, said base plate and top plate having plain vertically alined stop shoulders formed longitudinally thereon, and a pair of longitudinal shoulders formed on said base plate away from the outer edges thereof and in vertical alinement with the edges of the top plate.

2. In a magneto construction, a frame consisting of a single casting which comprises a base plate, a pair of end plates provided with axially alined openings, a top plate connecting said end plates, a housing formed on one of said end plates and terminating in a bearing portion, a pair of transversely alined brush openings in the side walls of

said housing, a perforated lug on said top plate, said base plate and top plate having plain vertically alined stop shoulders formed longitudinally thereon, and a pair of longitudinal shoulders formed on said base plate away from the outer edges thereof and in vertical alinement with the edges of the top plate.

3. In a magneto construction, a frame consisting of a single casting and comprising a base plate, a pair of end plates provided with axially alined openings, a top plate connecting said end plates, and a commutator housing formed on one of said end plates, said housing having a top opening and being provided with a pair of brush openings in its side walls, said housing terminating in a rectangular bearing portion for the armature shaft.

4. In a magneto construction, a frame consisting of a single casting which comprises a base plate provided at the corners with perforated lugs through which the frame is adapted to be fixed to a suitable support, a pair of similarly shaped end plates provided with axially alined openings, a top plate connecting said end plates, a housing formed on one of said end plates and terminating in a bearing portion, a perforated lug on said top plate, said base plate and top plate having plain vertically alined stop shoulders formed longitudinally thereon, and a pair of longitudinal shoulders formed on said base plate away from the outer edges thereof and in vertical alinement with the edges of the top plate.

5. In a magneto construction, a frame consisting of a single casting and comprising a base plate having downwardly extending flanges which terminate at the corners in supporting lugs, a pair of similarly formed end plates provided with axially alined openings, a top plate connecting said end plates and a reinforcement for said top plate, said reinforcement having a bolt hole therethrough.

6. In a magneto construction, a frame consisting of a single casting and comprising a base plate having downwardly extending flanges which terminate at the corners in supporting lugs, a pair of similarly formed end plates provided with axially alined openings, a top plate connecting said end plates, a perforate reinforcement for said top plate, a housing formed on one of said end plates with side openings for brushes, and a hinged cover for said housing.

7. In a magneto construction, the combination of a base plate, a pair of similarly shaped upright end plates integral therewith, similarly shaped housings extending outwardly from said end plates, said housings being provided with axially alined bearing portions, an armature shaft jour-

naled in said bearing portions, an armature and commutator carried by said shaft, said commutator extending into one of said housings, a top plate connected across said end plates and being of less width than said end plates to provide a recess on each side thereof, a perforated lug on said top plate, a plurality of U-shaped magnets resting directly on said base plate and having their legs extending into said recesses, so that the outer edges of the end plates engage the adjacent edges of the magnets, pole pieces for said magnets, a retaining pin passing through said perforated lug, and means at each end of said pin for engaging the magnets and rigidly clamping them in place.

8. In a magneto construction, the combination of a base, a pair of upright end plates integral therewith and provided with axially alined bearing portions, a top plate connecting said end plates and provided with a perforated lug, said end plates projecting beyond said top plate on each side thereof to form recesses, a plurality of magnets having portions extending into said recesses, so that the projecting sides of the end plates engage the adjacent edges of the magnets and lie flush with the outer faces thereof, the lower ends of the magnets resting directly on said base, a retaining pin passing through said lug and having a head on each end for engaging the magnets and rigidly clamping them in place, pole-pieces for said magnets having plain corners, and an armature supported in said bearing portions to rotate between said pole pieces.

9. A field structure for magnetos, comprising the combination of a base, a pair of similarly shaped upright end plates carried thereon, a top plate connecting said end plates, the latter projecting beyond the top plate at each side thereof to form rectangular recesses, an upwardly projecting portion on said base having a plain side surface, a downwardly projecting portion on said top plate, said portions being diametrically opposite and terminating in concentric surfaces, a pair of pole-pieces arranged between said top plate and said base, said pole-pieces having their inner plain sides resting against the sides of said projecting portions and having recesses concentric with the surfaces of said diametrically opposite portions, the outer sides of said pole pieces being flush with the edges of said top plate, and magnets resting on said base and in contact with said pole pieces, said magnets extending into the recesses between the end plates and flush with the outer edges thereof.

10. In a field structure for magnetos, the combination of a base provided with a pair of longitudinal shoulders, a pair of rectangular end plates carried by said base and integral therewith, a reinforced top plate con-

necting said end plates, the edges of said top plate being in vertical alinement with said shoulders, pole-pieces resting on said base and arranged between said base and top plates, the outer sides of said pole-pieces being flush with the edges of the top plate and the shoulders on the base, and magnets in contact with said pole-pieces, said magnets resting on said base and engaging said shoulders and top plate.

11. In a magneto construction, the combination of a frame-work including a base plate, a top plate and a pair of rectangular end plates projecting beyond said top plate on each side thereof to form recesses, a plurality of U-shaped magnets having portions extending into said recesses and lying flush with the projecting edges of the end plates, and clamping means attached to the top plate for holding the magnets securely in place.

12. In a magneto construction, the combination of a frame-work including an integral base plate, a top plate, and a pair of end plates projecting beyond said top plate on each side thereof to form rectangular recesses, a pair of U-shaped magnets having portions extending into said recesses and lying flush with the projecting sides of the end plates, a lug on said top plate, a retaining pin connected to said lug, and heads on the ends of said pin for engaging the magnets and securely holding them in direct contact with the projecting edges of said top plate.

13. In a magneto construction, the combination of a frame-work including a base plate, a top plate and a pair of end plates projecting beyond said top plate on each side thereof to form recesses, a plurality of U-shaped magnets having portions extending into said recesses and resting on said base-plate with their sides engaging the projecting edges of the end plates, and means connected to said top plate for holding the magnets securely in place.

14. In a magneto construction, the combination of a base, a pair of rectangular end plates carried thereon, a housing extending outwardly from each end plate, a rectangular bearing portion on each housing, said bearing portions being in axial alinement for supporting the armature shaft, and a removable bearing bushing inserted in each bearing portion.

15. In a magneto construction, a frame-work comprising a flanged base, a reinforced top plate, a pair of similarly shaped end plates, and a substantially hemi-spherical housing extending outwardly from each

end plate, said housings being provided with axially alined bearing portions for receiving the armature shaft.

16. In a magneto construction, a frame-work comprising a base, a top plate, a pair of similarly shaped end plates, a substantially hemi-spherical housing extending outwardly from each end plate, said housings being provided with axially alined bearing portions for receiving the armature shaft, and a hinged lid over the top of one of said housings to permit access to the parts within.

17. In a magneto construction, a frame consisting of a single casting and comprising a flanged base plate, a pair of similarly shaped end plates provided with axially alined openings, a top plate connecting said end plates, and a hemi-spherical housing formed on one of said end plates.

18. In a magneto construction, a frame consisting of a single casting and comprising a flanged base plate, a pair of rectangular end plates provided with axially alined openings, a top plate connecting said end plates and flush with the upper edges thereof, and a perforated lug formed on said top plate.

19. In a magneto construction, the combination of a frame-work, stationary field magnets carried thereby, a pair of rectangular housings extending outwardly from the ends of said frame-work and having their outer edges flush with said magnets, bearing portions on said housings, an armature and commutator journaled in said bearing portions, said commutator extending into one of said housings, a lid hinged to said last-mentioned housing to permit access to the commutator, and brush openings in projections disposed on opposite sides of said housing.

20. In a magneto construction, the combination of a frame-work, stationary field magnets carried thereby, a pair of housings extending outwardly from the ends of said frame-work, one of said housings being cast integral with said frame-work, and the other being bolted thereto, bearing portions on said housings, an armature and commutator journaled in said bearing portions, said commutator extending into the integral housing, and a lid hinged to said integral housing to permit access to the commutator.

In witness whereof, I hereunto subscribe my name this twenty fourth day of April. A. D. 1911.

BERT WHELCHER.

Witnesses:

LOUISE MCINTIRE,
FRANK C. AYRES.