W. WRIGHT.

AIR COMPRESSOR.

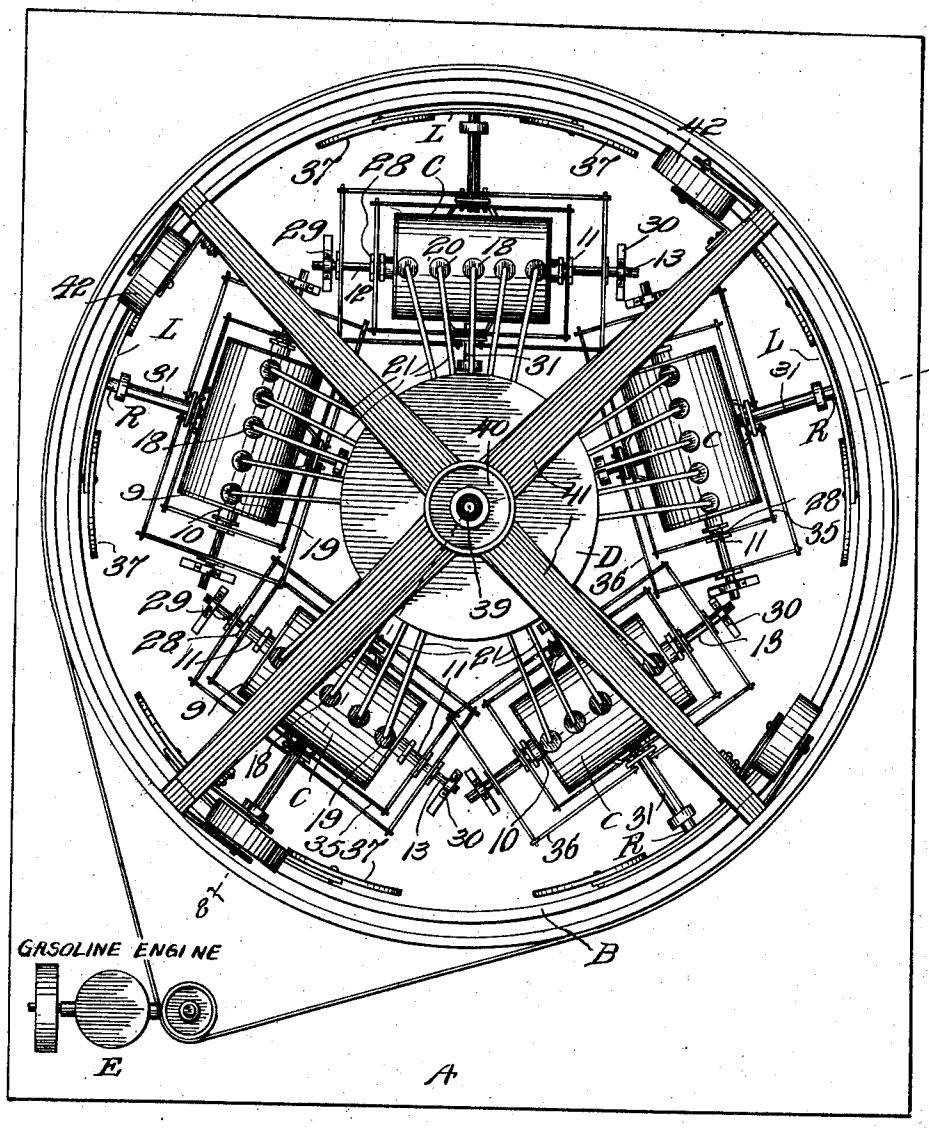
APPLICATION FILED AUG. 3, 1909.

963,676.

Patented July 5, 1910.

4 SHEETS—SHEET 1.

Fig. 1



Witnesses

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4 SHEETS—SHEET 2.

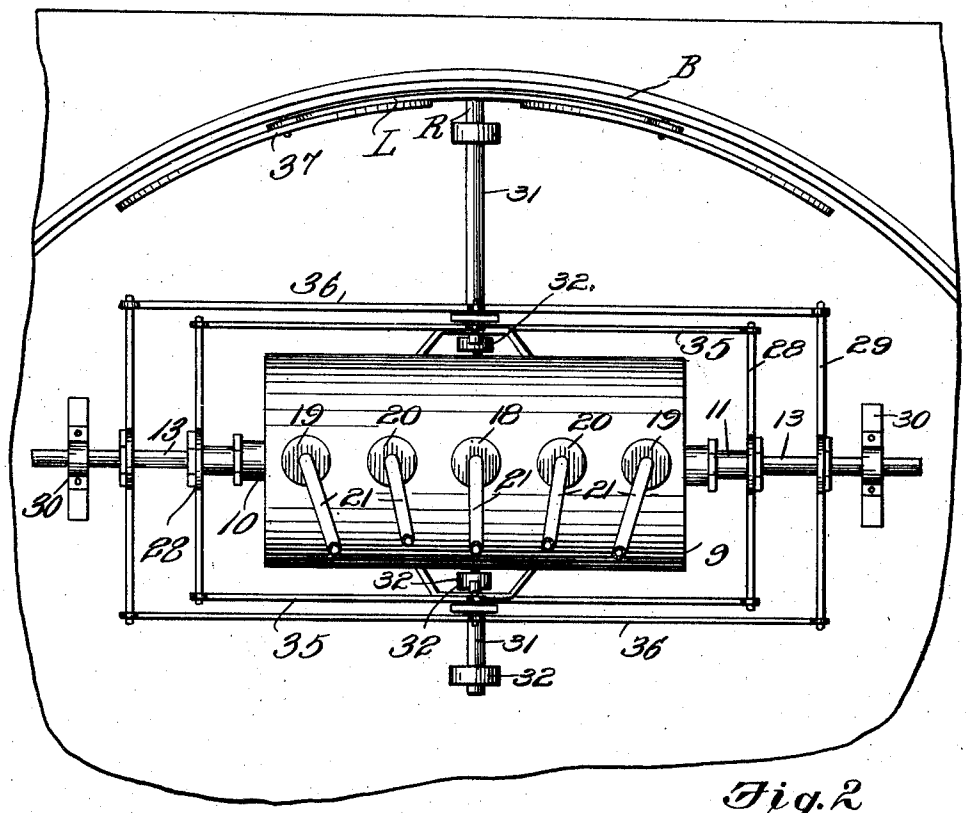

Fig. 2

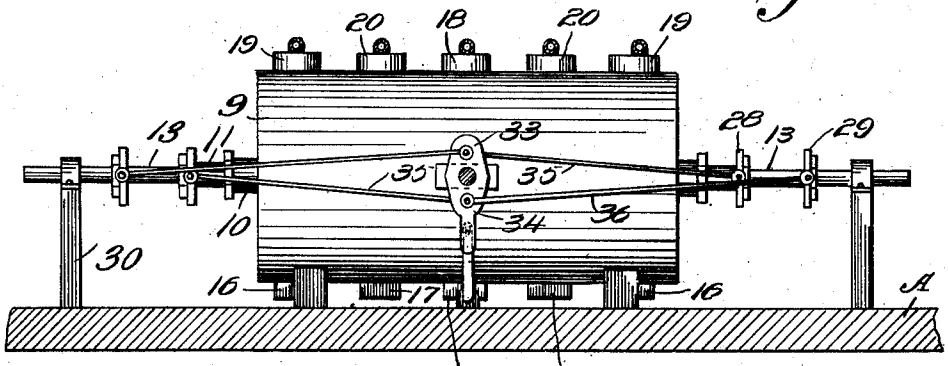

Fig. 3

Witnesses

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4 SHEETS—SHEET 3.

Fig. 4

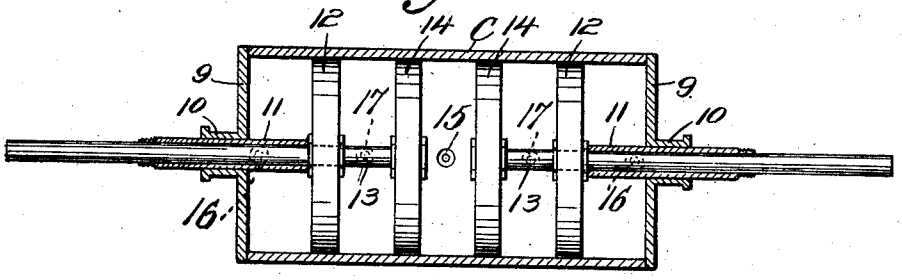


Fig. 5

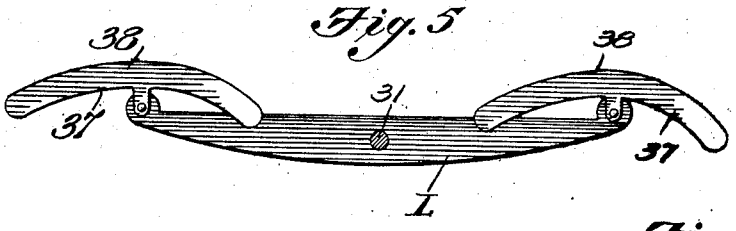


Fig. 6

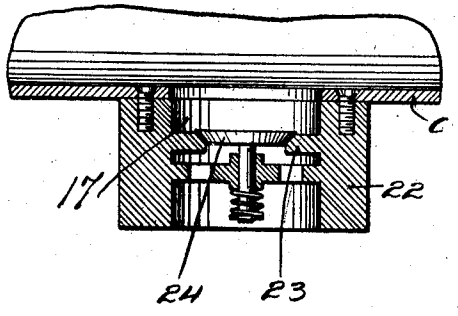
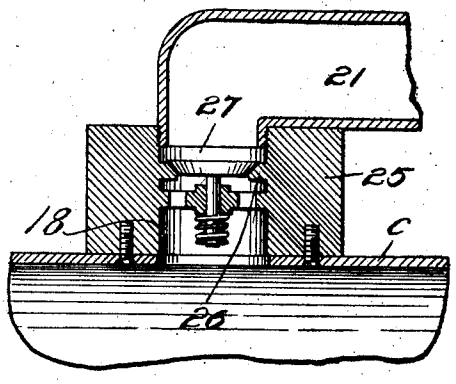


Fig. 7



Witnesses

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4 SHEETS—SHEET 4.

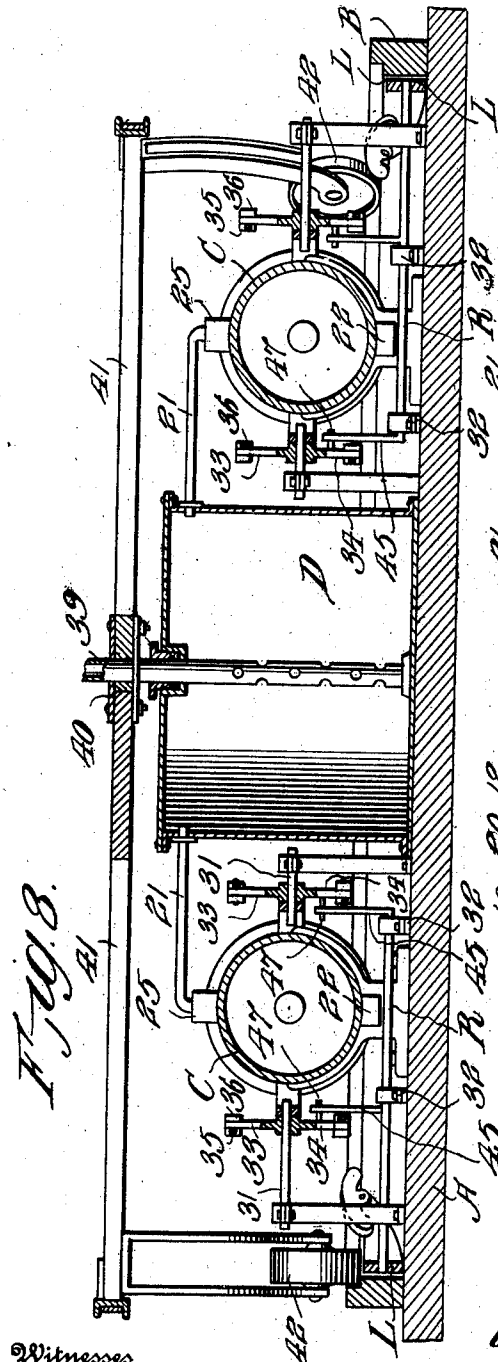

Fig. 8.

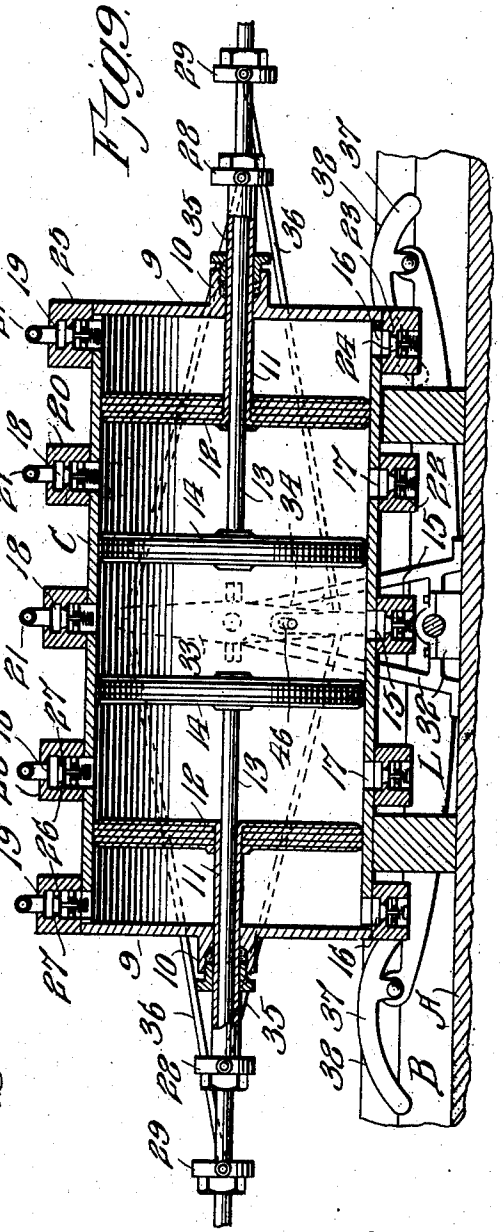

Fig. 9.

Witnesses

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UNITED STATES PATENT OFFICE.

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AIR-COMPRESSOR.

963,676. Specification of Letters Patent. **Patented July 5, 1910.**

Application filed August 3, 1909. Serial No. 511,029.

To all whom it may concern:

Be it known that I, WILLIAM WRIGHT, a citizen of the United States, residing at Adamsville, in the county of Jefferson and State of Alabama, have invented new and useful Improvements in Air-Compressors, of which the following is a specification.

This invention relates to machines for compressing atmospheric air to be utilized for the purpose of driving machinery of various kinds and for all other purposes for which compressed air is employed; and it has for its object to produce a machine comprising a plurality of cylinders arranged in series adjacent to a circular track, said cylinders being equipped with air compressing pistons adapted to be operated through the medium of levers actuated by the gravity of a roller traveling upon the track.

Further objects of the invention are to simplify and improve the construction and operation of this class of devices.

With these and other ends in view, which will readily appear as the nature of the invention is better understood, the same consists in the improved construction, novel arrangement and combination of parts which will be hereinafter fully described and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of the invention; it being however understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations and modifications within the scope of the claims, may be resorted to when desired.

In the drawings: Figure 1 is a top plan view of an air compressing device, constructed in accordance with the invention. Fig. 2 is a top plan view on a larger scale showing one of the compressing cylinders and related parts. Fig. 3 is a side elevation of one of the compressing cylinders and related parts. Fig. 4 is a horizontal sectional view taken through one of the compressing cylinders. Fig. 5 is a side elevation of one of the actuating levers. Fig. 6 is a sectional detail view of one of the valved air inlets. Fig. 7 is a sectional detail view of one of the valved discharge ports. Fig. 8 is a vertical transverse sectional view taken on the plane of the line 8—8 in Fig. 1. Fig. 9 is a vertical sectional view taken longitudinally through one of the cylinders.

Corresponding parts in the several figures are denoted by like characters of reference.

A suitable base A supports a circular track B which surrounds a plurality of air compressing cylinders C—C, the latter being arranged and suitably supported within and adjacent to the track, preferably at equal distances apart, and at equal distances from the latter; said cylinders being disposed with their axes approximately at right angles to the diameter of the track.

The two heads 9 of each cylinder are each provided with a bearing 10 for a tubular rod 11 carrying a piston 12; additional piston rods 13 carrying pistons 14 are guided through the tubular piston rods 11. Each cylinder is provided in the lower side thereof with a valved inlet port 15 disposed midway between its ends; additional inlet ports 16 are disposed adjacent to the ends of each cylinder; and inlet ports 17 are disposed about midway between the ports 16 and the central port 15; the construction of said valved ports will be hereinafter described. Valved discharge ports 19 are disposed upon the upper parts of the cylindrical casings midway between the ends of the latter; additional discharge ports 19 are arranged adjacent to each end of each cylinder; and discharge ports 20 are arranged intermediate the ports 19 and the central discharge ports 18 of each cylinder as will best appear by reference to Fig. 2 of the drawings. Conducting pipes or tubes 21 connect the discharge ports of each cylinder with a centrally disposed reservoir or storage tank D.

Each of the inlet ports comprises a casing 22 having a seat 23 for a spring pressed valve 24 which opens in the direction of the cylinder upon which the casing 22 is suitably mounted, as will be best seen by reference to Fig. 6; in like manner each outlet port comprises a casing 25 suitably mounted upon the respective cylinders and having a seat 26 for a spring-pressed valve 27 opening from the cylinder in the direction of the storage tank D as will be best seen in Fig. 7. It is obvious that valves operated by gravity or by mechanical means other than springs may be substituted for the spring-pressed valves herein shown, such substitution being within the range of ordinary mechanical skill.

Each of the tubular piston rods 11 of each cylinder is provided with a cross head 28,

and each of the piston rods 13 is likewise equipped with a cross head 29; bearings 30 for the piston rods 13 have been shown mounted upon the base at a suitable distance from the heads of each cylinder for the purpose of guiding the piston rods and lessening the vibration resultant from the operation of the device.

Rock shafts 31 are supported in suitable bearings 32 adjacent to each side of each of the cylinders; said rock shafts being disposed at right angles to the axes of the cylinders, midway between the ends of the latter, and radially with reference to the circular track B; each of these rock shafts is provided with arms or cranks 33 and 34 extending in diametrically opposite directions, and said arms or cranks will for convenience be referred to as the upwardly and downwardly extending cranks designated respectively 33 and 34. Links 35 connect each of the cranks 33 and 34 with the cross head 28 of one of the tubular piston rods; and links 36 in like manner connect each of the crank arms 33 and 34 with the cross head 29 of one of the piston rods 13, connection being in this manner established between the rock shafts 31 adjacent to the sides of the cylinder to insure uniformity of action.

Supported in suitable bearings and extending transversely beneath each cylinder is a rock shaft R extending in the direction of the track B and carrying adjacent to said track a lever L having arms of equal length equipped with shoes or cams 37 having arcuate upper faces 38. Each rock shaft R is provided with upwardly extending arms or cranks 45 having slots 46 engaging pins or studs 47 upon the arms 34 that extend downwardly from the rock shafts 31, thus permitting oscillatory motion from the rock shaft R to the rock shafts 31 when the rock shaft R is oscillated. The storage tank or reservoir D is provided with an axially disposed upwardly extending discharge pipe 39 affording a bearing for a hub 40 having a plurality of radially extending arms or spokes 41, the number of which is preferably one less than the number of cylinders arranged in circumferential series adjacent to the track. Suitably hitched to and connected with each of the spokes or sweeps 41 is a gravity roller 42 traveling upon the track B and overlapping the latter sufficiently to engage the shoes 37 connected with the levers L; the arcuate faces of said shoes being so formed that when one of the shoes is depressed, the other shoe shall be elevated to such an extent as to lie in the path of the rollers traveling upon the track. It will thus be seen that each of the gravity rollers will impart to each lever traversed thereby a rocking movement whereby the rock shaft connected therewith is oscillated to and fro.

From the foregoing description taken in connection with the drawings hereto annexed the operation and advantages of this invention will be readily understood. The number of the cylinders C with the levers L adjacent thereto and that of the roller carrying spokes or sweeps being unequal, or varying by one, it follows that one of the levers will at all times be engaged by one of the rollers, and that the several levers will be successively engaged by each roller as it traverses the track, no two levers being at the same time in precisely the same position. By the oscillatory movement of the rock shafts R and 31, the piston carrying rods will be actuated by the intermediate mechanism, the tubular rods 11 and the rods 13 being actuated in opposite directions. Thus, when air is admitted through the ports 15 and 16 into the spaces between the pistons 12 and the heads of the cylinders and into the spaces intermediate the pistons 14, air will be expelled through the ports 20 in the direction of the storage tank or reservoir while, when the movement of the piston carrying rods is reversed, air will be admitted through the ports 17 into the spaces intermediate the pistons 12 and 14 while it will be expelled from the spaces intermediate the pistons 14 and from the spaces between the pistons 12 and the heads of the cylinders, through the ports 18 and 19 in the direction of the storage tank.

The hub carrying the sweeps or spokes 41 may be driven from any suitable source of power such as a gasolene engine supported upon the base A as indicated at E in Fig. 1 of the drawings; motion being transmitted from said engine to the hub through the medium of a belt, band or link belt or through intermediate gearing of any description.

By the means herein described, atmospheric air may be quickly and effectively compressed to be subsequently utilized for the purpose of driving machinery or for other purposes for which compressed air is usually employed.

Having thus described the invention, what is claimed is—

1. In an air compressing device, a storage tank or reservoir, a plurality of air compressing cylinders arranged in circumferential series around the tank, said cylinders being disposed at equal distances apart and with their axes at right angles to lines radiating from the tank, pairs of oppositely movable pistons in each cylinder, and means for continuously actuating the pistons of each cylinder in succession.

2. In an air compressing device, a centrally disposed receiving tank, air compressing cylinders disposed in series at equal distances apart circumferentially around the tank, oppositely movable pairs of pistons in each cylinder, air inlet and outlet ports upon the cylinders, the latter ports being con-

nected with the receiving tank, and means for continuously actuating the pairs of pistons of each cylinder in succession.

3. In an air compressing device, a centrally disposed receiving tank, a plurality of compressing cylinders arranged in circumferential series around the tank, oppositely movable pairs of pistons in each cylinder, valved inlet ports upon the lower side of each cylinder, valved outlet ports upon the upper side of each cylinder, pipes connecting the outlet ports with the receiving tank, and means for continuously actuating the pistons of each cylinder in succession.

4. In an air compressing device, a circular track, a storage tank disposed centrally of the track, a cylinder supported intermediate the track and the tank approximately at right angles to the radius of the track, tubular piston carrying rods guided through the heads of the cylinder, piston carrying rods guided through the tubular rods, cross heads upon each of the piston carrying rods, rock shafts supported adjacent to the cylinder, radially with reference to the track, pairs of cranks upon said rock shafts, links connecting the cranks with the cross heads, an auxiliary rock shaft extending transversely beneath the cylinder, means for transmitting oscillatory motion from said auxiliary rock shaft to the rock shafts adjacent to the cylinder, a shoe-carrying lever mounted upon the auxiliary rock shaft adjacent to the track, a sweep supported for rotation upon the axis of the tank, a gravity roller carried by the sweep engaging and overlapping the track to engage the shoe carrying lever, and inlet and outlet ports connected with the cylinder, the latter ports being also connected with the tank.

5. In an air compressing device, a circular track, a cylinder supported adjacent to the track and provided with valved inlet and outlet ports, oppositely movable pairs of pistons in the cylinder, piston rods extending through the heads of the cylinder, cross heads upon the piston rods, a rock shaft supported adjacent to the cylinder and radially with reference to the track, cranks upon said rock shaft, links connecting the cranks with the cross heads, an auxiliary rock shaft extending transversely beneath the cylinder, means for transmitting oscillatory motion from the auxiliary rock shaft to the rock shaft supported adjacent to the cylinder, a shoe carrying lever upon the rock shaft auxiliary, and a roller arranged to travel upon the track, said roller overlapping the track to engage the shoe carrying lever.

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

WILLIAM WRIGHT.

Witnesses:
JOHN BIVENS,
DAVE HOSKETT.