

L. A. GATES.
AIR COMPRESSOR.
APPLICATION FILED OCT. 30, 1908.

916,857.

Patented Mar. 30, 1909.

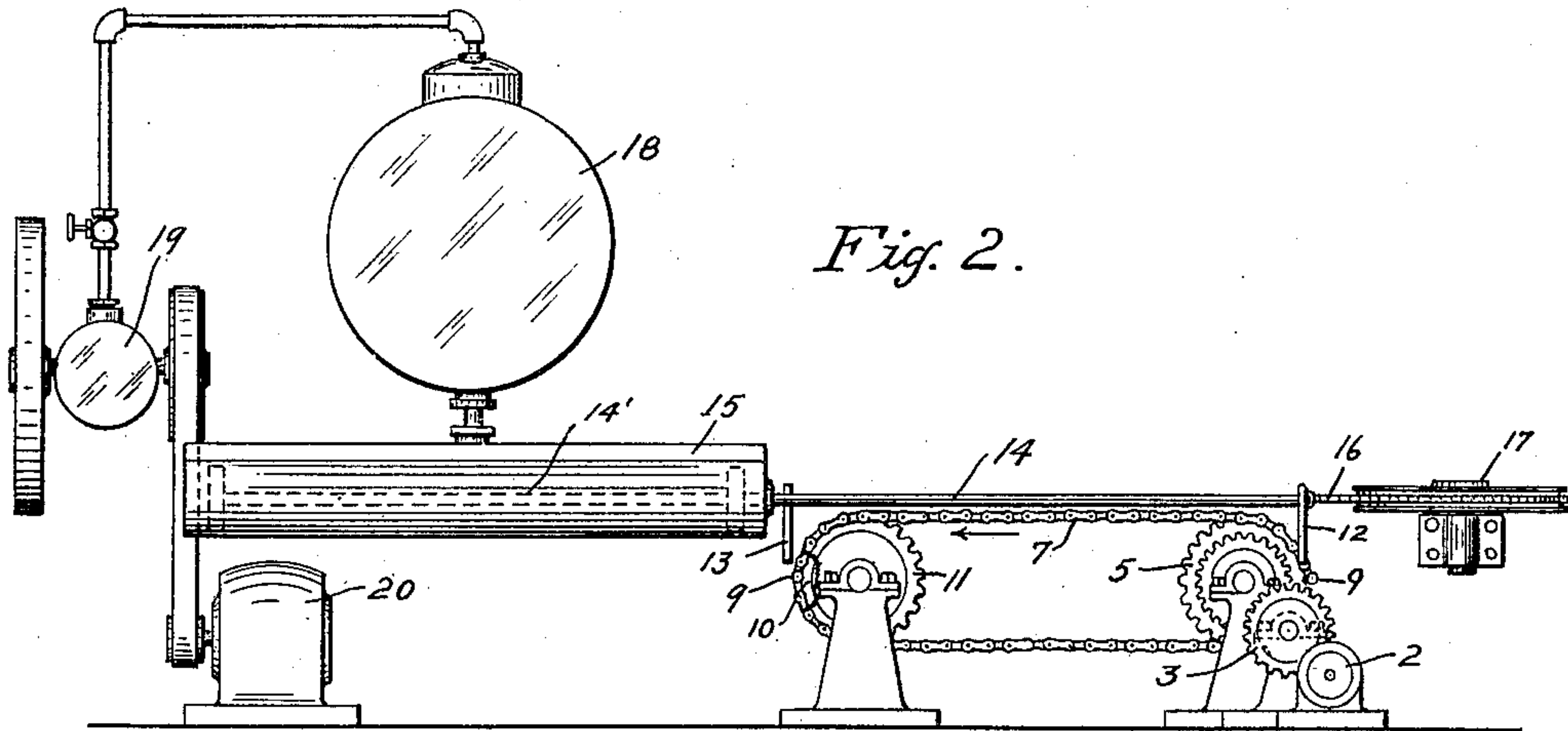


Fig. 3.

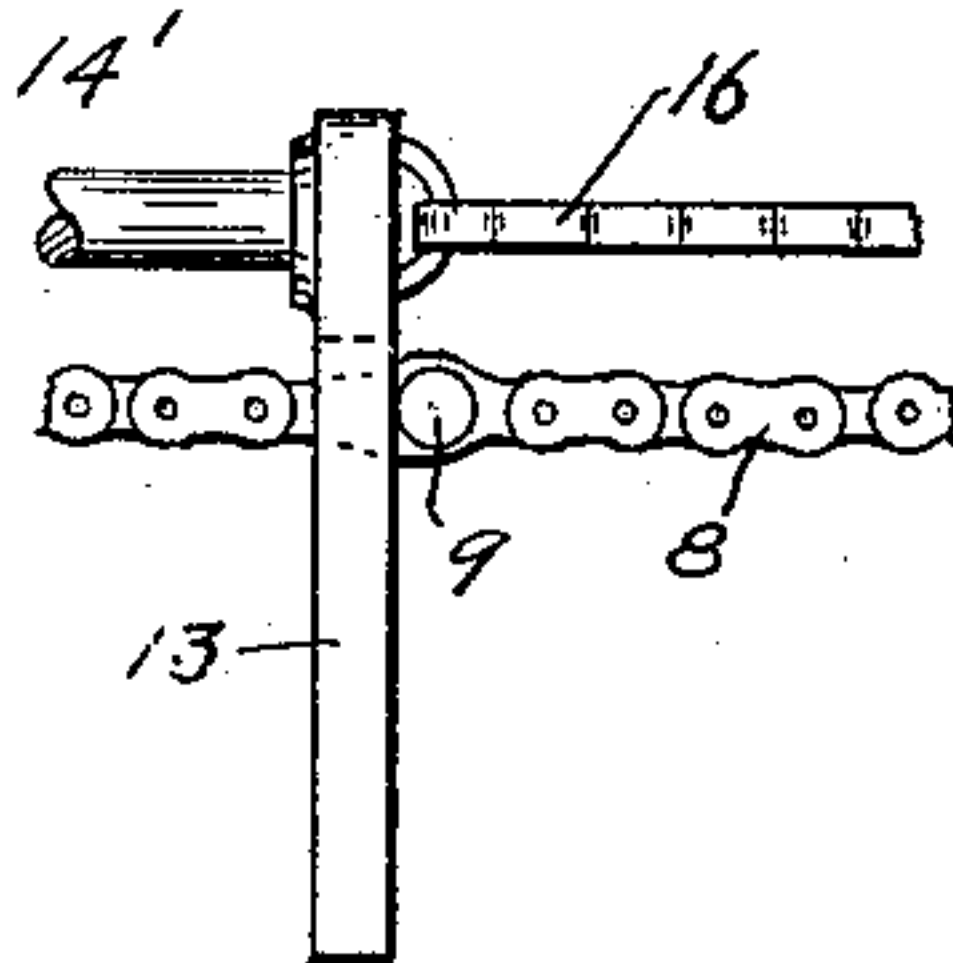


Fig. 4.

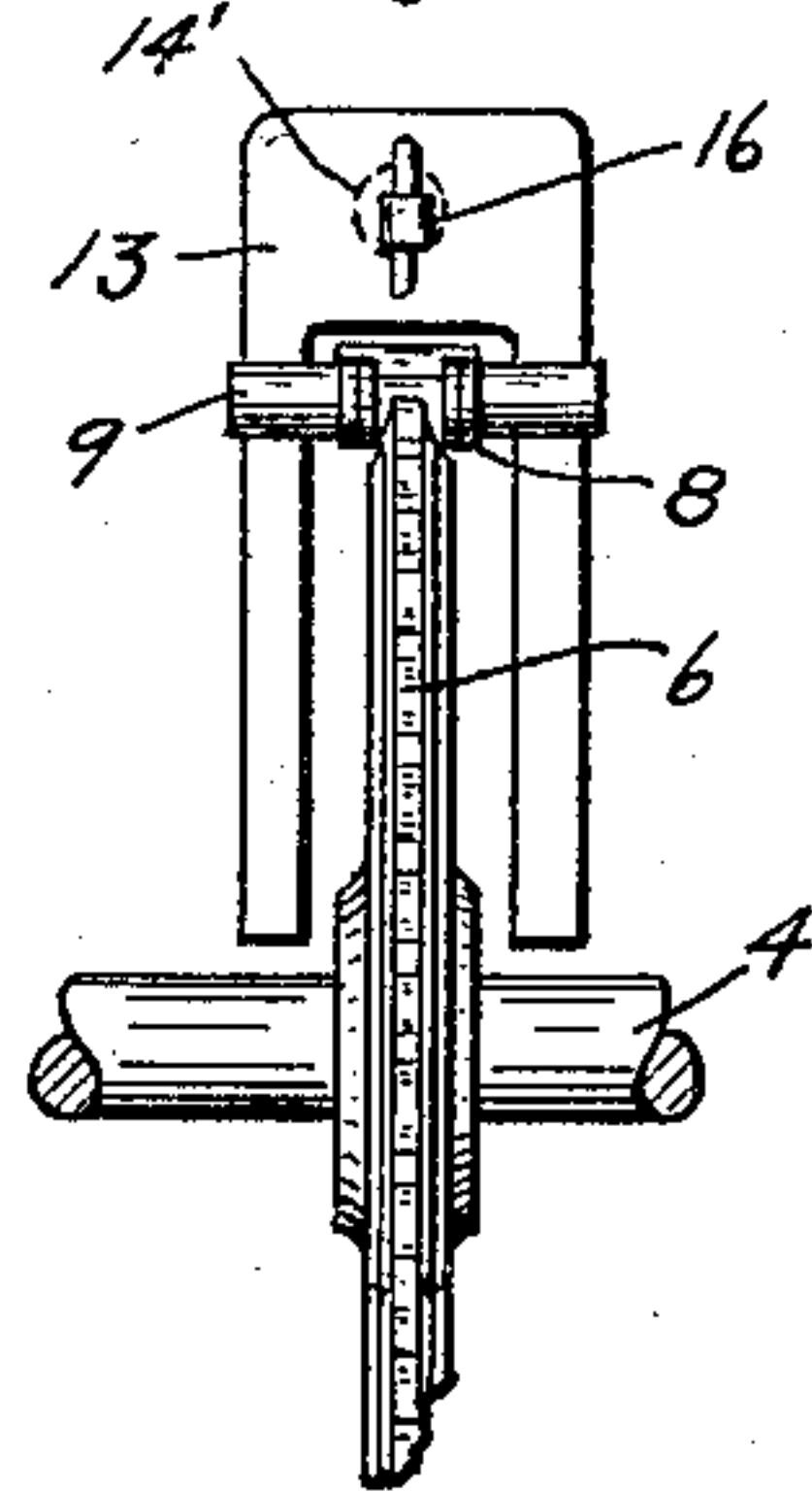
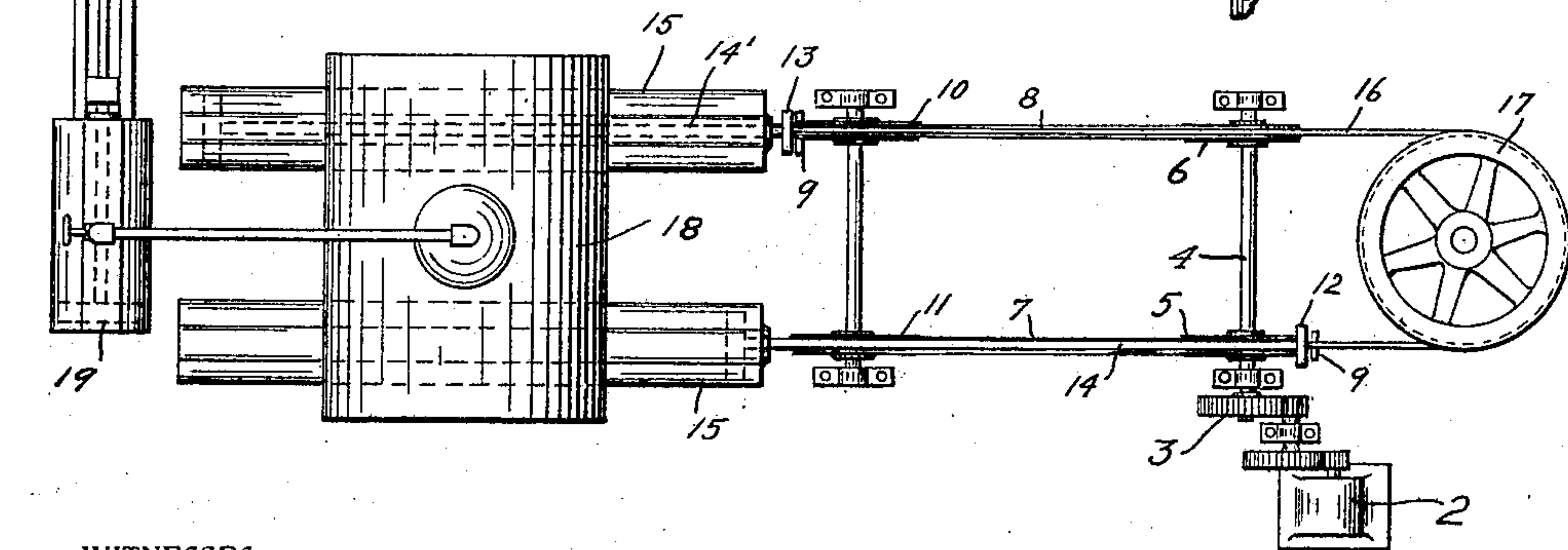


Fig. 1.



WITNESSES

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LEWIS A. GATES, OF OROVILLE, CALIFORNIA, ASSIGNOR OF ONE-HALF TO G. M. SPARKS,
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AIR-COMPRESSOR.

No. 916,857.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LEWIS A. GATES, citizen of the United States, residing at Oroville, in the county of Butte and State of California, have invented new and useful Improvements in Air-Compressors, of which the following is a specification.

My invention relates to an apparatus for the generation and conservation, and distribution of power.

It is an object of my invention to provide a simple, continuous-acting apparatus, in which is combined a suitable driving motor, a fluid compressing device, a receiver and motor adapted to be run from the compressed fluid in the receiver.

It is another purpose of the invention to provide a machine of few elements, and of very strong structure.

A further object is to provide means for converting electrical energy into fluid pressure, such for instance as compressed air, and in conjunction with other means for utilizing this compressed air in any way desirable.

My invention consists of the elements, and the construction and combination of elements or their equivalents as set forth in the accompanying specifications and drawings, in which—

Figure 1 is a plan view of the apparatus. Fig. 2 is a side view of the same. Figs. 3 and 4 are details of the chain-driving mechanism.

As shown in Fig. 1 of the drawings, I use an electrical motor 2, which is connected by gearing 3 to operate a shaft 4 upon which are mounted suitable sprocket-wheels 5 and 6, and here shown as operating in a vertical plane. Passing around each of the sprockets 5 and 6 are chains 7 and 8 respectively, suitably secured upon each of which is a dog or lug 9, which is adapted to be carried by the chains in their traveling around the sprocket-wheels 10 and 11. The purpose of these dogs 9 is to engage with yokes 12 and 13, which are secured at the end of piston-rods 14—14' of suitable air-compressors 15, in such a manner as to reciprocate the piston-rods and their pistons in the cylinders 15. The lugs 9 are situated relatively to each other upon their respective chains 7 and 8 so as to cause one of the pistons to be at its rearward maximum position, while the other piston is in its forward maximum position. At 16 I have shown a sprocket or other suitable chain, which is secured at the ends of the piston-

rods 14—14', and contiguous to the yokes 12 and 13. The chain is then passed over a suitable supporting-wheel 17, shown operating in a horizontal plane, and as the lugs 9 engage their respective yokes 12 and 13, one lug, for instance, engaging the yoke 13 on piston-rod 14', will operate to reciprocate that rod, forcing it backwardly into its cylinder 15, and by reason of the chain connection between the two piston-rods 14—14', as one of said piston-rods is forced backwardly by the lug 9, the chain 16 will then pull the other piston forwardly in its cylinder. In this way, it will be seen that when a lug 9 operates on either of the piston yokes 12 or 13, the other piston is simultaneously reversed in its motion. The air-compressing cylinders illustrated, are known as double-acting, and consequently the two cylinders are compressing air at one time, although only one of the lugs 9 is operatively in engagement with one of the yokes 12 or 13. By this construction it will be seen that the two sprocket chains 7 and 8 are continuously driven in one direction, each carrying its respective lug 9; and these being so arranged that, as one of the lugs has reached its maximum rearward position, during its travel having forced the piston-rod 14 rearwardly as far as it will go in the cylinder 15, this lug then passes freely away from the yoke 12, just as the lug 9 at the forward end of the machine, on the other chain, for instance chain 8, will then go up into engagement with the yoke 13 on the piston rod 14'. In this manner there is no reversal either of the motor 2, the gears 3, or the shaft 4 and its associated members.

The use of the chain 16 affords a flexible, powerful means of connecting the two pistons and rods 14, so that they are synchronously actuated, and only one lug 9 is required on either of the chains 7 or 8 to accomplish the operation of the compressors.

As is shown in Figs. 3 and 4, the yoke 13 is rigidly secured upon the piston-rod 14', and depends to such length as to just clear the shaft 4, and the shafts upon which the sprockets 10 and 11 operate.

The lugs 9 which engage the yokes 12 and 13 may be of any desirable construction, and are here shown as simply pins which project from a suitable collar or link mounted in the sprocket-chains 7 and 8.

The compressed air derived from the cylinders 15 may be conducted to any desirable

point where it may be utilized, and I have shown in the present case the receiver 18 into which the compressor is discharged, and from which the air is admitted to operate 5 suitable engines 19, which are here shown as being connected to operate a dynamo 20 from which a current may be distributed and utilized as required.

Having thus described my invention, what 10 I claim and desire to secure by Letters Patent is—

1. In an apparatus of the character described, parallel compression cylinders with pistons and piston-rods, slotted yokes fixed 15 to the ends of the rods, a horizontal chain, an idler around which it passes, said chain having its ends connected with the piston rods, endless chains passing around sprocket-wheels in vertical planes and having lugs to 20 alternately engage the slotted yokes when traveling above their sprockets, and be disengaged therefrom at the inner end to return below the sprockets.

2. In an apparatus of the character described, parallel cylinders having pistons 25 and piston-rods, a chain having its ends connected with the ends of the piston-rods, a horizontally journaled idler around which the bight of the chain passes, vertical 30 sprocket-wheels revoluble beneath the rods and chains, endless chains passing around said sprockets, forked yokes fixed to the ends of the piston-rods and extending on each side of the upper portion of the end-

less chains, lugs carried by the chains 35 adapted to engage the yokes during the upper portion of their travel, and to be disengaged therefrom as they descend to the lower portion of the travel, said lugs being 40 so located with relation to each other that the yokes of the piston-rods will be alternately engaged and the rods and plungers will be caused to reciprocate in opposite directions.

3. In an apparatus of the character described, parallel compression cylinders with 45 pistons and piston rods connected to reciprocate in opposite directions, sprocket-wheels journaled beneath the rods at a distance apart equal to the length of stroke, chains 50 passing around said sprocket-wheels, each carrying engagement lugs in opposition to each other, slotted yokes fixed to the piston-rod ends extending downwardly over the upper portions of the endless chains, whereby the 55 lugs upon the chains alternately engage the yokes to reciprocate the pistons in one direction, and are disengaged from the yokes at the end of the stroke, to allow the pistons to be returned during the corresponding 60 stroke of the other piston.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

LEWIS A. GATES.

Witnesses:

GEO. H. STRONG,
CHAS. A. SLACK.