

(No Model.)

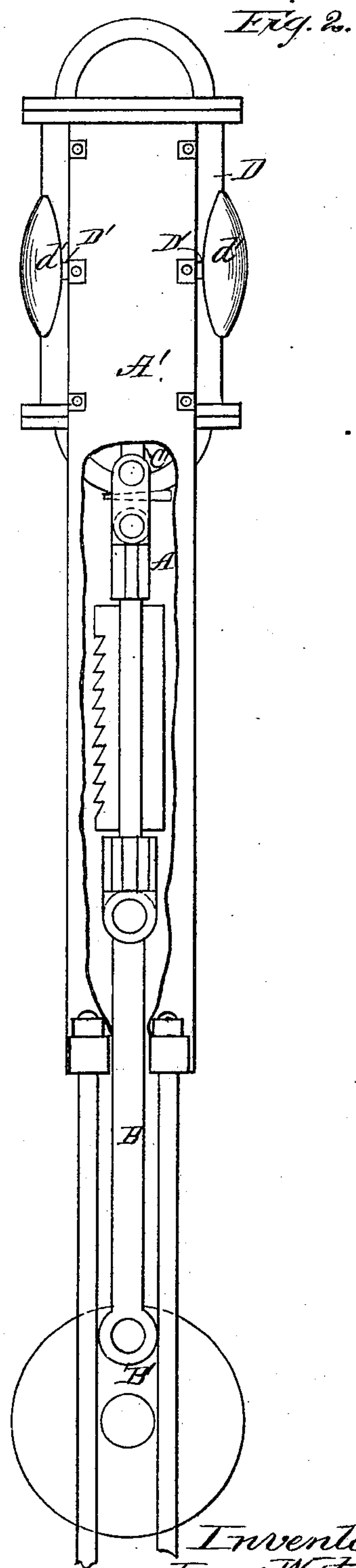
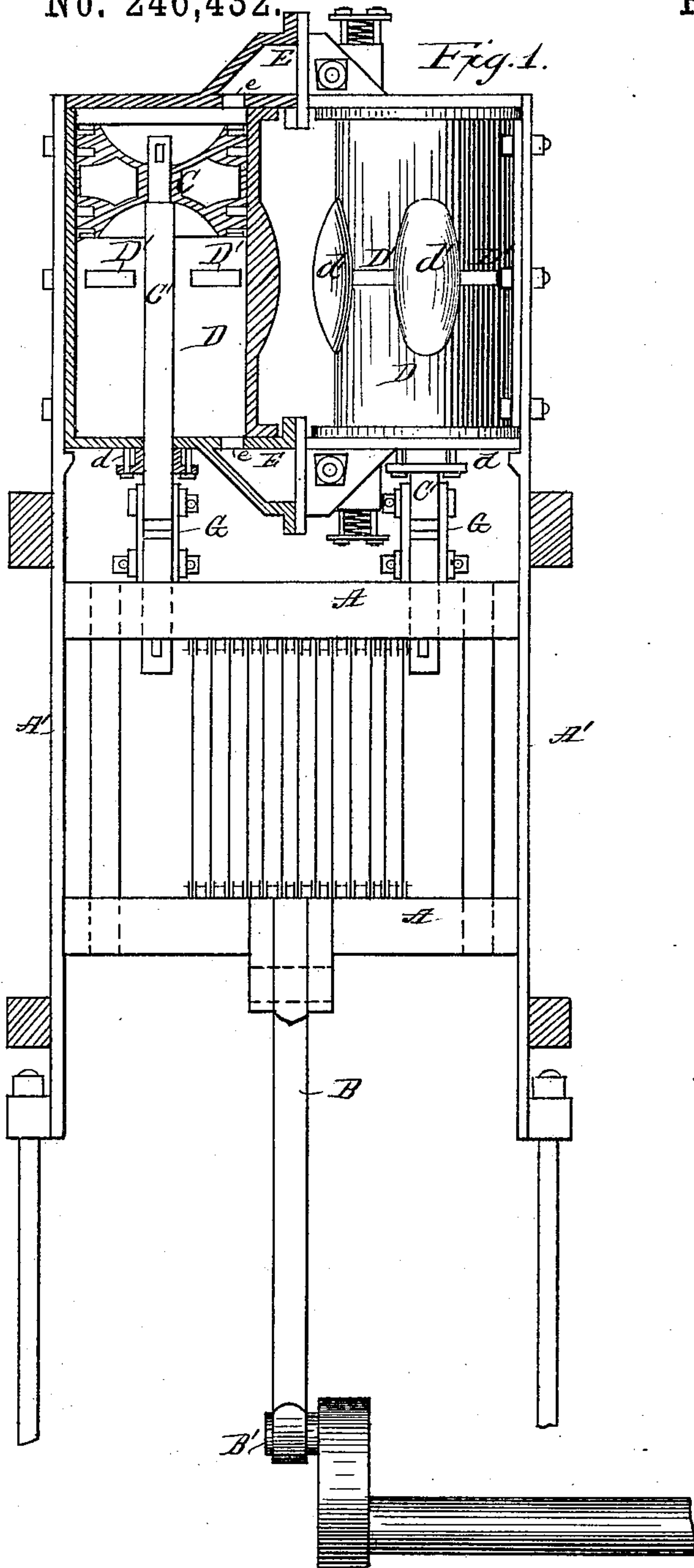
2 Sheets—Sheet 1.

J. WATERS.

AIR BUFFER FOR SAW MILLS.

No. 246,432.

Patented Aug. 30, 1881.



Attest:
Charles S. Hoyer.
C. S. Hoyer

Inventor:
James Waters.
By his Attorneys
Elliott & Doolittle

(No Model.)

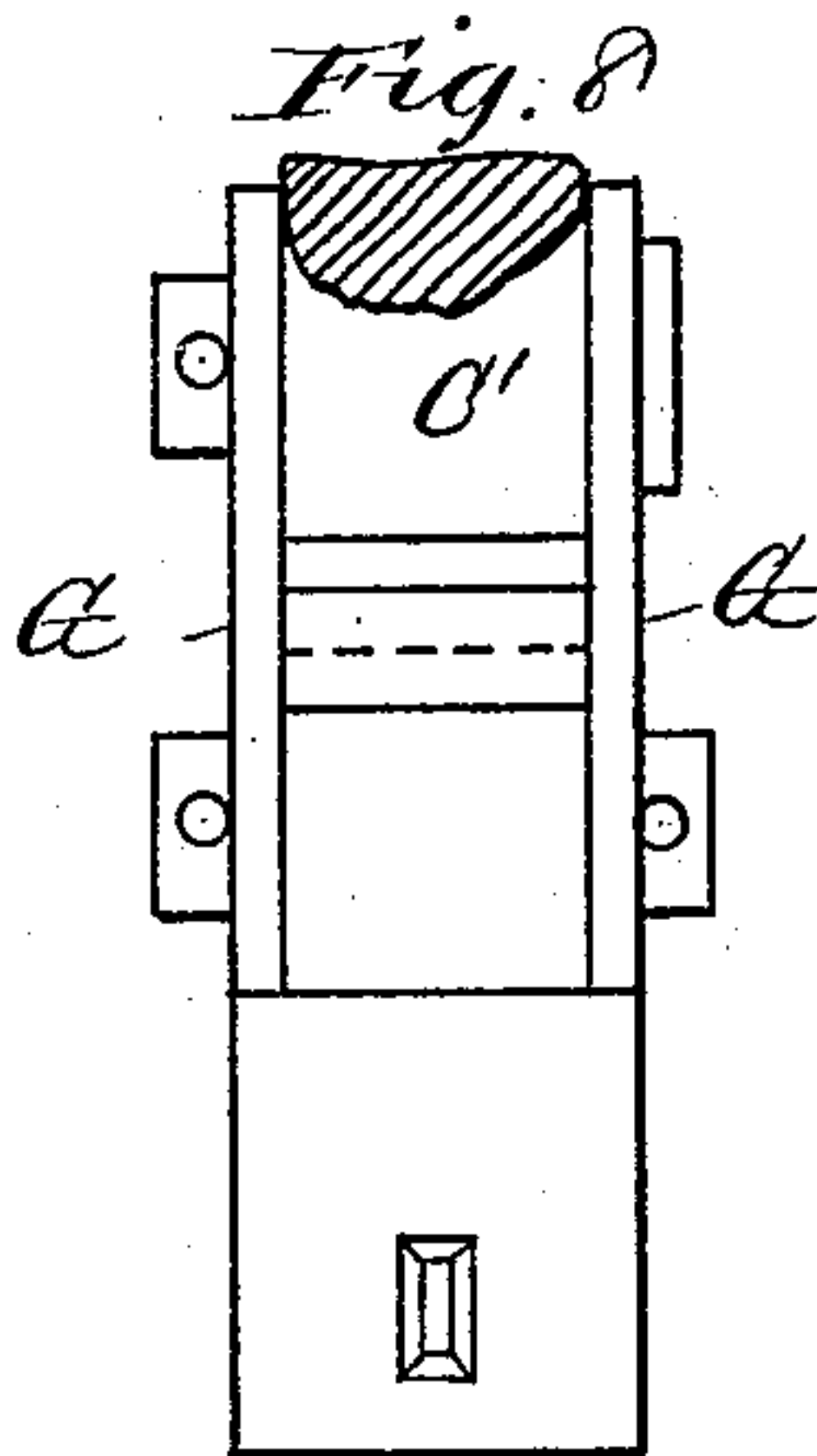
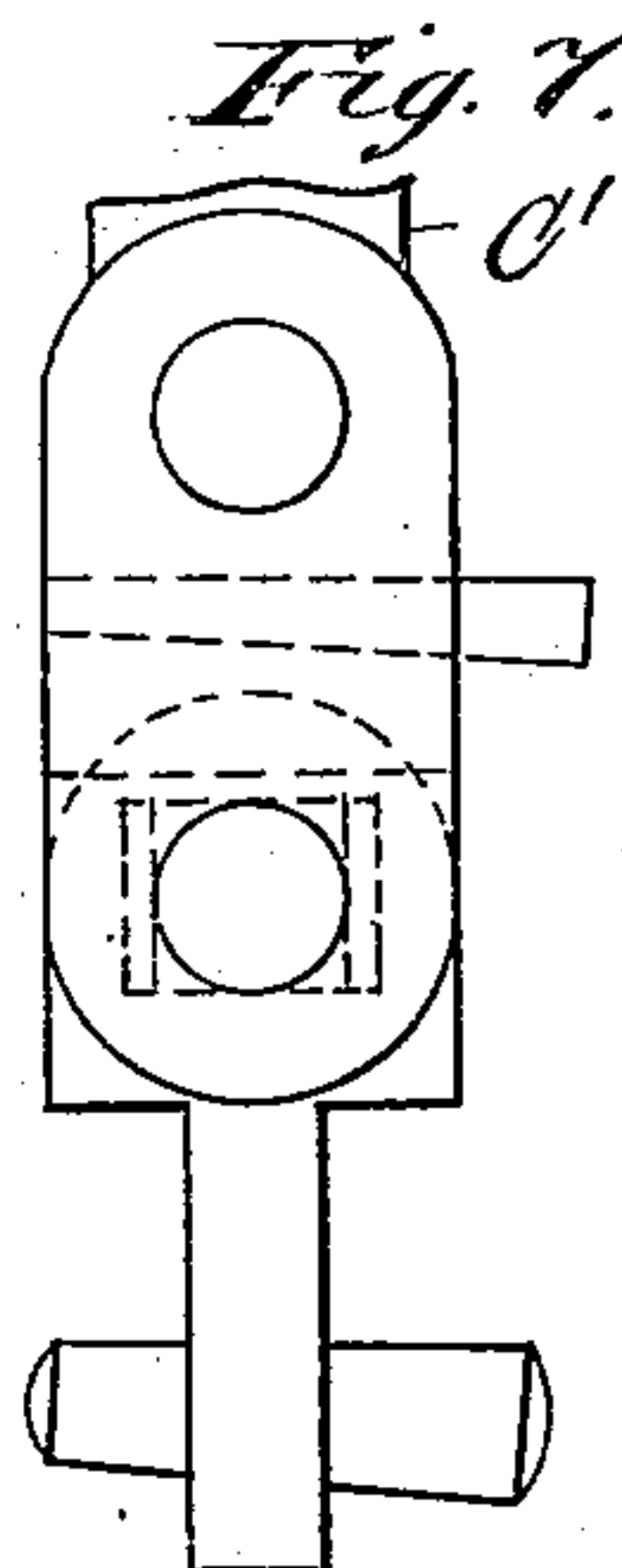
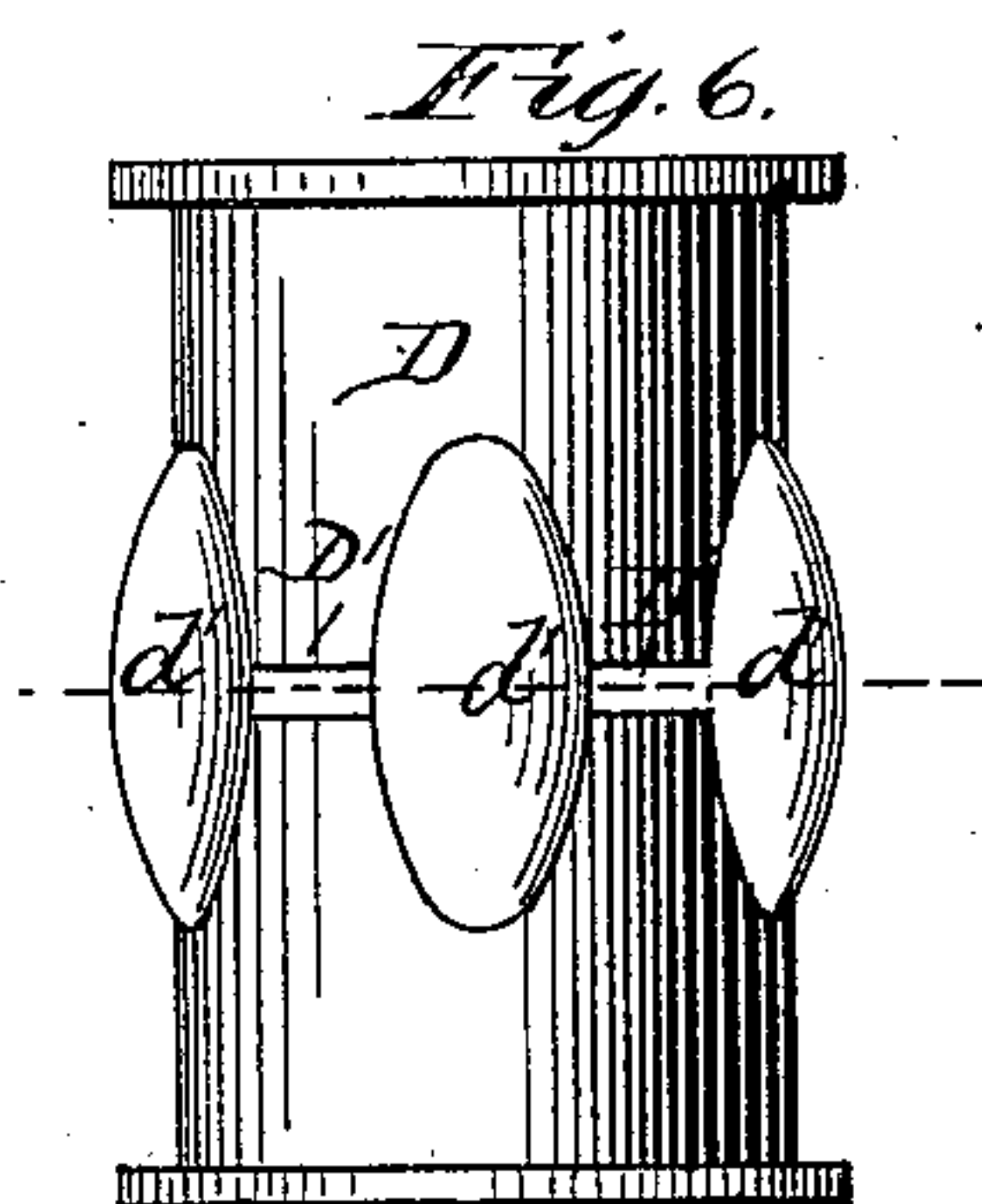
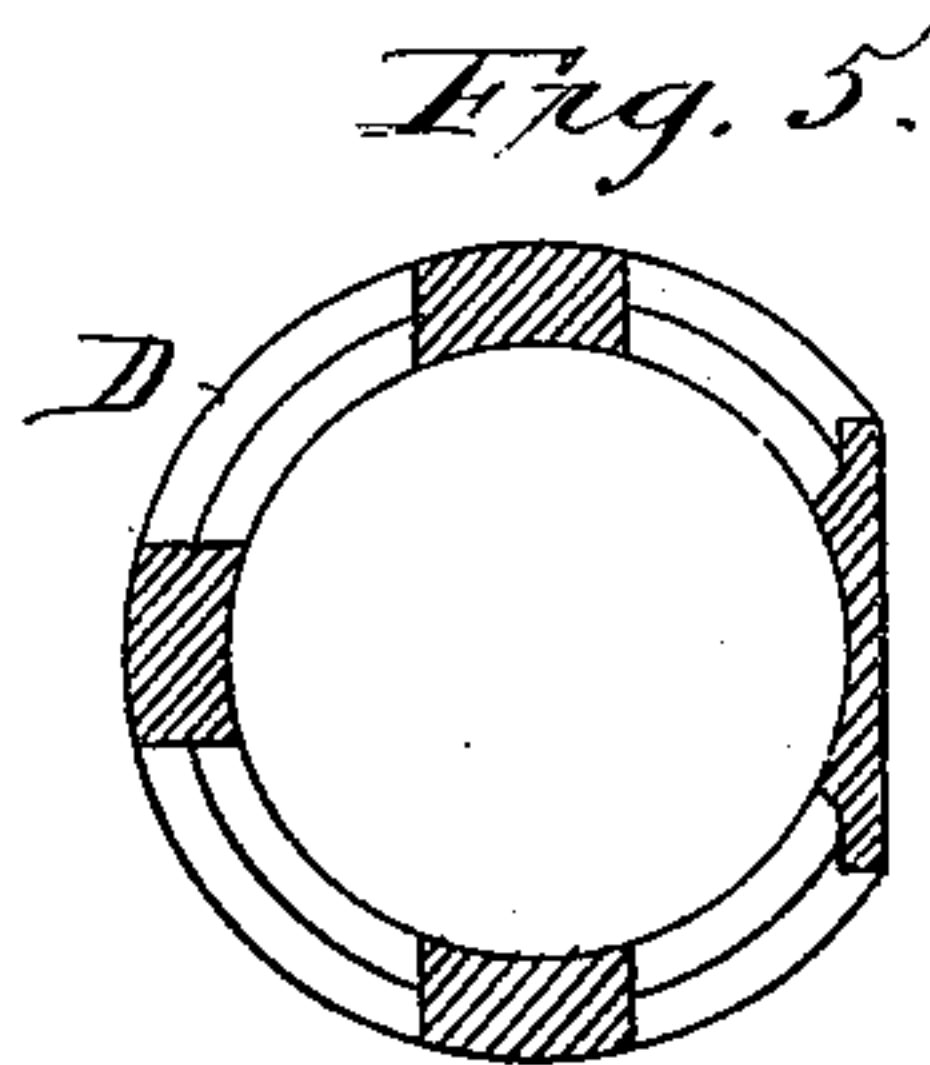
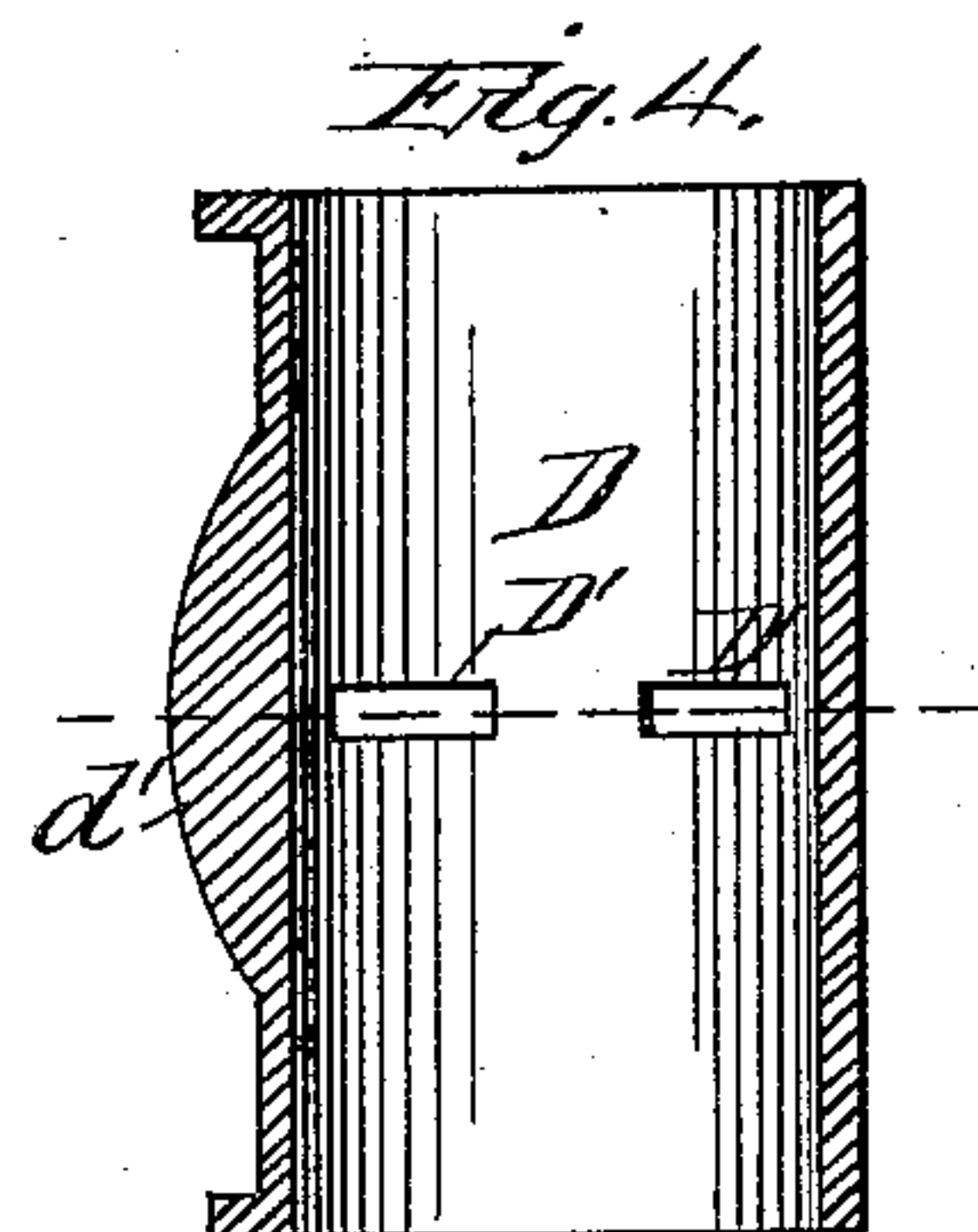
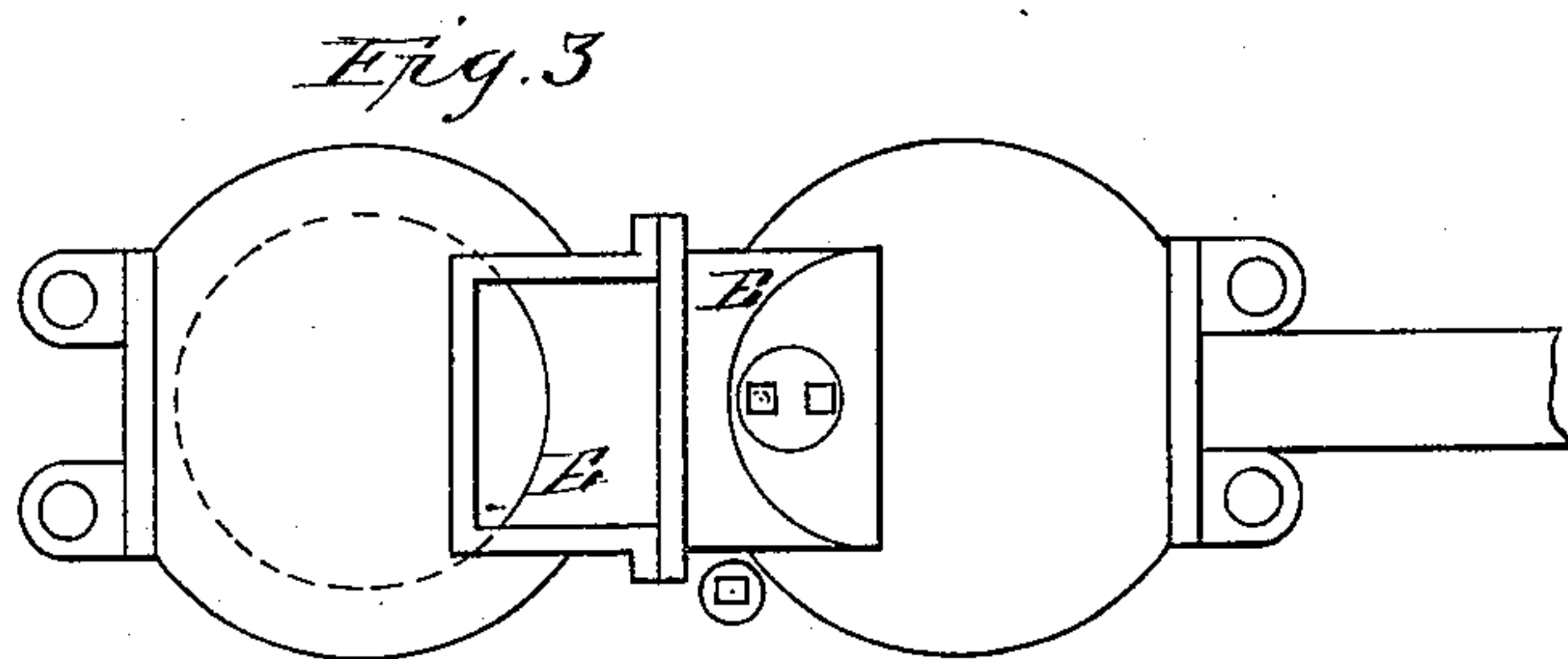
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UNITED STATES PATENT OFFICE.

JAMES WATERS, OF MINNEAPOLIS, MINNESOTA.

AIR-BUFFER FOR SAW-MILLS.

SPECIFICATION forming part of Letters Patent No. 246,432, dated August 30, 1881.

Application filed March 21, 1881. (No model.)

To all whom it may concern:

Be it known that I, JAMES WATERS, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Air - Buffers for Saw - Mills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings and to the letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to reciprocating gang-saws.

The object of the invention is to provide means by which the saw-frame and its adjuncts will be cushioned at the end of each stroke, thereby relieving the crank on the driving-shaft from strain and counteracting the tendency to pound when said crank is passing centers.

To this end the invention consists in combining the saw-frame with one or more double-acting air-compressors; also, in the provision of means of regulating the air-pressure resisting the movement of the saw-frame at the end of a stroke; also, of various details of construction and arrangement connected with the application of cushioning air compressor or compressors.

In the annexed drawings, Figure 1 is a front elevation of my invention. Fig. 2 is a side elevation of the same. Figs. 3, 4, 5, 6, 7, and 8 are details of various parts of the gang-saw.

The same letters refer to the same parts in all the figures.

The saw-frame A is mounted to slide in guides A', and is connected by means of a connecting-rod, B, extending from its lower cross-head, with a crank, B', on the main driving-shaft. Mounted above the saw-frame A are two double-acting air compressors or cylinders, D, provided with pistons C, having rods C', which extend down through stuffing-boxes d in the lower heads of the cylinders. To the lower end of the piston-rods C' are pivoted the ends of links G, the other ends of which are pivoted to wrists secured to the upper cross-head of the saw-

frame. The cylinders D which I prefer to use are provided with apertures D' about midway of their length, for the admission and exit of air. Between the apertures D' are formed ribs d' on the exterior of the cylinders, to give strength to that portion thereof, which would otherwise be weakened by the apparatus D' therein.

Each cylinder-head is provided with an outlet, e, opening into a neck, E, terminating in a flange. These flanges are, when the cylinders are placed in position, bolted together, thus establishing communication between the cylinders at the ends to equalize the pressure therein and providing an air-chamber beyond the stroke of the pistons at each end of the cylinders. These necks also serve to connect the cylinders rigidly together, thereby avoiding the necessity of providing girders for that purpose. These necks should be so constructed as to admit of the contraction of the space in the air-chambers within them to regulate the degree of compression by the pistons; and to this end they may be provided with hand-holes, closed by suitable caps, so that blocks or plugs may be inserted to fill up such space more or less, or they may be provided with metal plugs sliding in openings in the shell of the necks and operated by screws. The necks are also provided with safety-valves to relieve any excess of pressure in the cylinders. They are also provided with cocks or valves, by means of which the air may be permitted to escape when the mill has ceased running.

It is desirable that the piston should commence compressing before it reaches half-stroke. In order to accomplish this end with the compressors shown the piston must be twice the length of the distance at which it is desired to commence compressing before reaching half-stroke plus the width of the apertures in the cylinders. Thus, if it is desired to commence compression five inches before arriving at half-stroke and the apertures in the cylinder are two inches wide, then the piston must be of a length equal to $5'' + 5'' + 2'' = 12''$.

The compressors are bolted to and supported by an upward extension of the guides A', as shown.

I have shown and described a saw-frame

combined with two compressors; but it is evident that this number may be increased, or only one be used, suitable changes being made in the air-chambers and in the manner of supporting the compressor or compressors without departing from the spirit of my invention.

I have heretofore described my air-compressing cylinders as having apertures at the center for the admission of air. It will be understood, however, that ordinary tight cylinders can be used, care being taken that the pressure on each side of the piston shall be equal when said piston is at half-stroke.

Instead of forming the air-chambers outside the ends of the cylinders, as shown, an air-space may be provided by making the cylinders longer with relation to the stroke of the piston, so that a space will be left at each end of the cylinder beyond the stroke of said piston. In this modification provision should be made for increasing or for diminishing this air-space and suitable outlet-valves.

Having thus described my invention, what

I claim, and desire to secure by Letters Patent, is—

1. The combination, substantially as before set forth, of a saw-gang, a fixed double-acting air-compressing cylinder, a piston always reciprocating through the same space in the cylinder, an air-chamber at each end of the cylinder, and means, substantially such as described, for increasing or diminishing the capacity of such air-spaces.

2. The combination, substantially as before set forth, of a saw-gang, two double-acting air-compressing cylinders, and the cylinder-heads constructed with flanged necks, which form chambers at each end of the cylinders into which the air from said cylinders is compressed and which also unite and brace the cylinders.

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

JAMES WATERS.

Witnesses:

S. B. CHASE,

W. L. BASSETT.