

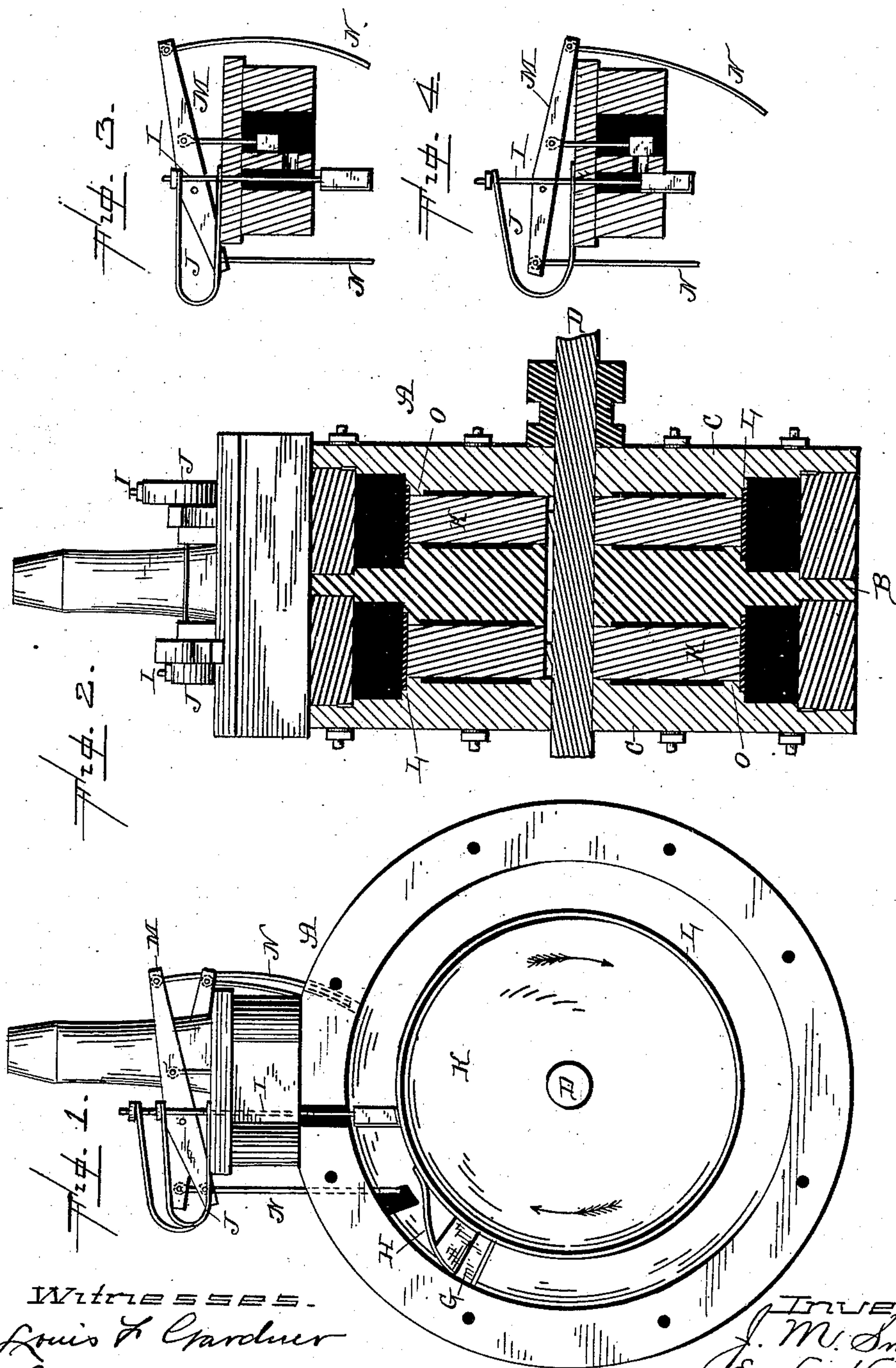
(No Model.)

J. M. SMELSER & E. L. KENNEDY.

ROTARY STEAM ENGINE.

No. 286,856.

Patented Oct. 16, 1883.



Witnesses.
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UNITED STATES PATENT OFFICE.

JAMES M. SMELSER AND EMMETT L. KENNEDY, OF RUSHVILLE, INDIANA.

ROTARY STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 286,856, dated October 16, 1883.

Application filed August 2, 1883. (No model.)

To all whom it may concern:

Be it known that we, JAMES M. SMELSER and EMMETT L. KENNEDY, of Rushville, in the county of Rush and State of Indiana, have invented certain new and useful Improvements in Rotary Steam-Engines; and we 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

Our invention relates to an improvement in rotary steam-engines; and it consists in the combination of the casing or frame, suitable rotary wheels or pistons, steam-actuated abutments, and suitable valves, which are controlled either by a grooved collar upon a shaft or by pivoted levers which have their inner ends project through the casing, as will be more fully described hereinafter.

The object of our invention is to produce a rotary engine in which the abutment is forced inward against the rotary wheel by the pressure of the steam, and which abutment is so moved as to obtain the full pressure of the steam against the piston which is formed upon the wheel.

Figure 1 is a side elevation of an engine embodying our invention, one of the sides or covers being removed. Fig. 2 is a vertical cross-section of the engine. Figs. 3 and 4 are details of the valves and abutments.

A represents the frame, which is preferably made round, as here shown, and which may be divided by partitions B into any desired number of cylinders, according to the power desired. The outer plates or covers, C, and the central partition, B, are correspondingly shaped upon the sides next to the revolving pistons K, so that the removable projecting copper tires or packing-rings L, with which the pistons are provided, will catch over the shoulders or flanges O, formed upon them. By thus shaping the side of the frame and the piston as shown, there is no room for the escape of steam toward the driving-shaft D, to which the revolving pistons or wheels are secured in the usual manner. Upon the outer edge of the wheels or pistons K is formed a suitable shoulder or projection, G, against which the steam strikes for the purpose of

driving the wheel around. This shoulder is wider than the wheel to which it is secured, and secured to the rear of this shoulder and to the top of the wheel is a suitable incline, H. This incline may be formed as one solid piece with the wheel; or it may be formed separately, as here shown. This incline serves to operate the abutments, against which the steam bears while the wheel or piston is being forced around. Each of the abutments is placed in a small chamber or compartment by itself, and has projecting from its upper side a rod, I, which has a suitable spring, J, connected to it. These springs serve to draw the abutment up out of the circular cylinder into its compartment while the shoulder upon the wheel is moving under it and while the pressure of the steam is cut off from above it. The valve which controls the flow of the steam from the steam-chest into the compartments above the top of the abutment may be operated either by means of a suitable lever, M, upon the top of the steam-chest, having a rod, N, secured to each end, or the valves may be operated directly from the grooved collar which is placed upon the driving-shaft. Where the pivoted lever is used, the valve-rod is connected to the lever near its center, while the two rods attached to the ends of the lever project down into the cylinder and are operated by the shoulder formed upon the wheel. As the shoulder upon the wheel approaches the first of these rods, its end runs up upon the incline just back of the shoulder, and raises the end of the lever upward and instantly moves the valve, so as to shut off the steam from the top of the abutment, when the spring attached to the abutment instantly forces it upward, so as to allow the shoulder of the wheel to pass under. No sooner has the shoulder of the wheel passed under the abutment than the other rod instantly raises the opposite end of the lever, so as to shift the valves, and thus allow the steam to again enter the compartment and force the abutment down against the edge of the revolving wheel. The steam then continues to enter the cylinder and to force the wheel steadily around until the steam is again cut off. Where there are two of the wheels, the shoulders may be placed at separate points upon the wheels, so that while one wheel is

being moved at the full speed by the steam the other one is just passing under its abutment. In this manner the pressure of the steam, air, or gas is made continuous and even.

5 In case it should be desired to operate the valves by a grooved collar, which is secured directly to the shaft, there will be a lever pivoted upon each end of the case or frame, and to the upper end of this lever will be attached
10 the valve-rod, which will pass directly through the side of the frame. These levers pivoted upon the end of the frame will then have their ends shifted just in time to close the valve as the shoulder approaches the abutment, and
15 then closes it after the shoulder has passed under it. The steam, air, or gas which is used in driving the engine can be used expansively by thus being allowed to enter the cylinder and follow the piston or shoulder all the way
20 around. Should it be desired, each wheel may be furnished with a number of shoulders, in which case the valves and abutments will be moved a corresponding number of times oftener than when the single one is used upon each
25 wheel.

All of the moving parts will be packed in any suitable manner, so as to be steam, air, and gas tight, and the two cylinders will exhaust through the same opening. The steam-
30 pipe will introduce the steam into the steam-chamber, and from thence the steam will pass through the valves down in front of the abutments into the cylinders. As illustrated in Fig. 2, only two driving-pinions K are used;
35 but we may increase the number, if so desired,

in which case, where only one abutment is used to each piston, the piston will be so keyed to the shaft that the abutments will be at equal distances apart around the circle. Where we use more than two pistons, it is better to have 40 an escape-pipe for each.

We do not limit ourselves to the use of either steam, air, or gas in driving the engine, nor to any particular construction and arrange- 45 ment of parts, for these may be varied at will.

Having thus described our invention, we claim—

1. In a rotary steam-engine, the combination of the inclosing-case, the wheels K, secured to the driving-shaft, the projections G, inclines 50 H, the pivoted levers M, having the rods N attached to their opposite ends, springs J, rods I, the abutments, and the steam-chambers in which they are placed, substantially as shown.

2. In a rotary steam-engine, the combination 55 of the inclosing case or frame, the rotary wheels provided with shoulders or pistons, the spring and steam actuated abutments, and the pivoted levers to which the valves are attached, the ends of the levers being provided with rods which 60 pass through the frame into the cylinder, substantially as shown.

In testimony whereof we affix our signatures in presence of two witnesses.

JAMES M. SMELSER.
EMMETT L. KENNEDY.

Witnesses:

FRANCIS M. REDMAN,
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