

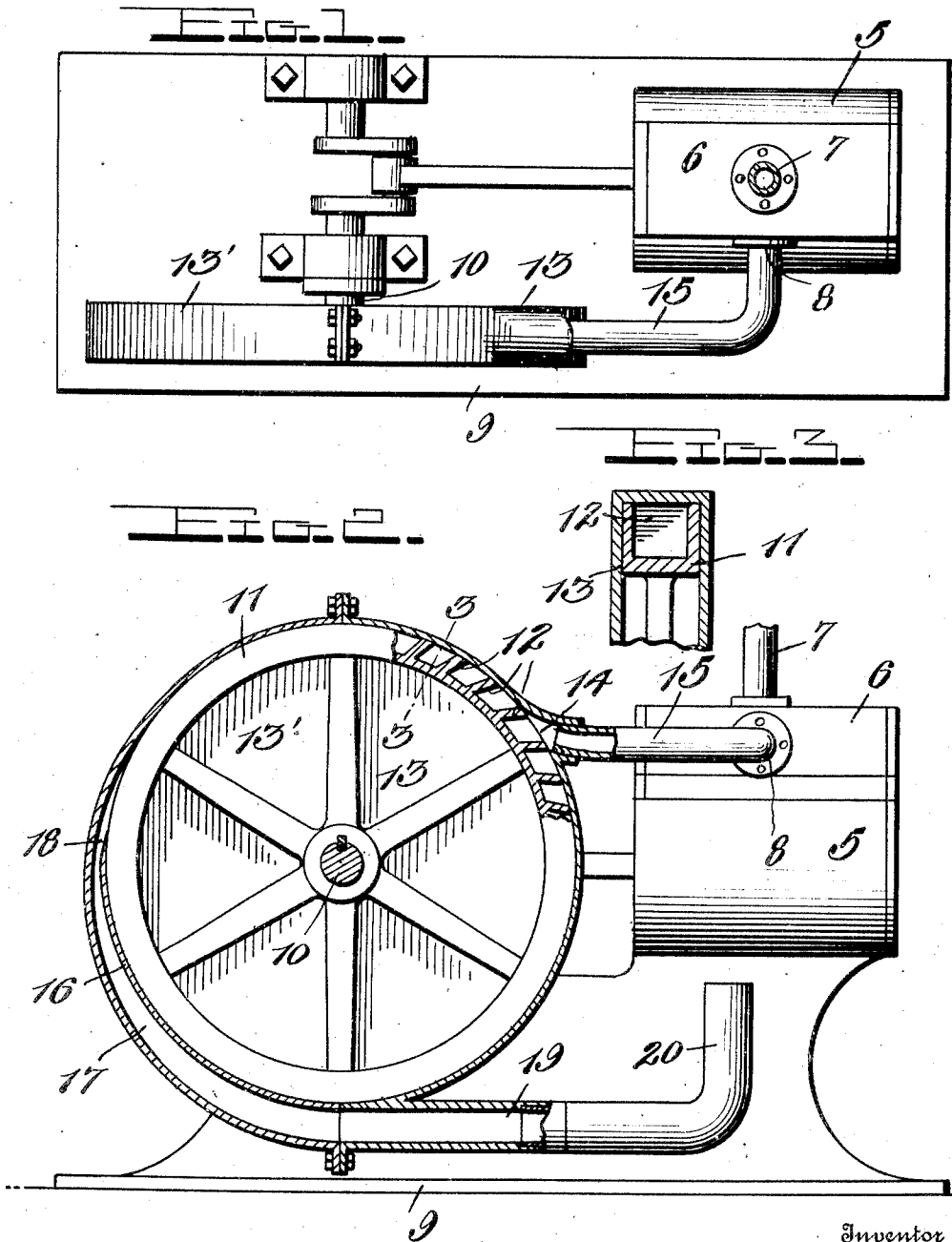
C. A. BLUME.

ENGINE.

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1,009,639.

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ENGINE.

1,009,639.

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To all whom it may concern:

Be it known that I, CHARLES A. BLUME, a citizen of the United States, residing at Greenville, in the county of Darke and State of Ohio, have invented certain new and useful Improvements in Engines, of which the following is a specification, reference being had to the accompanying drawings.

10 This invention relates to engines and has for its primary object to provide means for utilizing the exhaust of the engine as an auxiliary driving medium whereby a maximum of power may be obtained from a minimum consumption of fuel.

15 A further object of the invention is to provide means for directing the exhaust of the engine against a plurality of blades or vanes arranged in the rim of the fly wheel of the engine, and means to receive and discharge the exhaust fluid after it has expended its force upon said blades or vanes, thus preventing back pressure on the fly wheel.

20 Still another object of the invention is to provide a device of the above character which is simple in construction, strong, durable and efficient in practical use and may be manufactured and applied to the ordinary type of engine at a minimum expense.

25 With the above and other objects in view, the invention consists of the novel features of construction, combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

30 Figure 1 is a plan view of a steam engine having my improvements applied thereto; Fig. 2 is a side elevation, the rim of the fly wheel and its casing being shown in section; and Fig. 3 is a detail section taken on the line 3—3 of Fig. 2.

35 As above outlined the purpose of the present invention is to provide means for utilizing the exhaust of an engine whereby the percentage of working energy to be derived from a specified consumption of fuel may be greatly increased, and while I have illustrated the device in the accompanying drawings as applied to a steam engine of the horizontal single cylinder type, it will be

understood that the invention is also applicable to double or multiple-cylinder engines of either the horizontal or vertical type and also to gas or gasoline engines of the ordinary construction.

55 With the above end in view I have illustrated one embodiment of my invention in the drawings, wherein—

5 designates the engine cylinder and 6 the steam chest which is provided with a steam inlet port 7 and the exhaust port 8. The cylinder and steam chest are mounted upon one end of a suitable base 9 and on the other end of said base the power shaft 10 is mounted in suitable bearings. Upon the end of this power shaft the fly or balance wheel 11 is keyed or otherwise rigidly fixed.

60 The rim of the fly wheel is of substantially U-shaped form in cross section and between the parallel flanges of said rim the inclined blades or vanes 12 are formed. A suitable housing or casing 13 is provided for the fly wheel and this casing is preferably formed in two sections so that it may be readily removed when desired. The annular wall of one of the casing sections is provided with an inlet opening 14 to which one end of a conducting pipe 15 is connected. The other end of this conducting pipe is secured to the valve chest 6 over the exhaust port 8 thereof as clearly shown in Fig. 1. It will be observed that the inclined blades or vanes 12 of the fly or balance wheel are inclined toward the inlet port 14 of the fly wheel case as they pass the same so that the exhaust fluid from the steam chest 6 will impinge upon said blades or vanes and rotate or drive the fly wheel in the direction of the arrow in Fig. 2. One of the casing sections, indicated at 13' 90 has its outer annular wall disposed eccentric with relation to the fly wheel 11, said wheel at the upper portion or top of the fly wheel being disposed closely adjacent to the ends of the vanes 12 and extending around said fly wheel in gradually increasing spaced relation to said vanes. In this casing section 13' and between the side walls thereof, a wall 16 is arranged which extends in concentric relation to the fly wheel, said 100

wall and the annular wall of the casing section forming a passage 17 between them which is gradually restricted in area from its lower to its upper end, the upper end of the plate or wall 16 being only slightly spaced from the annular wall of the casing as indicated at 18, and between said walls and into the passage 17 the exhaust fluid is driven in the rotation of the fly wheel 11, after said fluid has expended the residue of its expansive force upon the blades or vanes 12. The other section of the casing 13 is provided at its lower end with a laterally extending tubular discharge neck 19 which forms a continuation of the passage 17. To this outlet or discharge neck the exhaust pipe 20 is connected, said pipe being vertically extended and adapted to discharge the devitalized fluid to the atmosphere.

From the foregoing description taken in connection with the accompanying drawings, it is thought that the construction and operation of the invention will be obvious. The engine is first started in the usual manner and as the actuating fluid is exhausted from the steam chest in the reciprocation of the engine piston, it is conducted through the pipe 15 and discharged into the fly wheel case 13 against the blades 12 in the rim of said wheel. This actuating fluid still contains considerable of its expansive properties which are exerted upon the blades or vanes to increase the momentum of the fly wheel and thereby proportionately increase the power to be derived from the consumption of fuel necessary for the operation of the engine. This steam or other actuating fluid is retained between the blades or vanes 12 of the fly wheel until said wheel has made approximately one-quarter of a revolution, when the greater portion thereof is discharged through the momentum of the wheel into the contracted upper end of the passage 17. From this passage the fluid passes into the pipe 20 from which it is exhausted to the atmosphere. By providing the passageway 17 which is isolated from the rim of the wheel 11, any back pressure upon the vanes or blades 12 is effectually prevented so that all of the remaining expansive properties of the exhaust fluid is utilized in the driving of the wheel, and the momentum thereof is not retarded. It is of course possible to dispense with the plate 16, but for the reasons above given, the foregoing construction would preferably be employed.

By the use of my improvements I aim to accomplish a material reduction in the cost of operation of steam and gas engines, and at the same time secure a maximum of power and entirely eliminate the great amount of waste energy as is now common in the operation of such engines. The device may be easily applied to an engine of the ordinary

construction without in any way altering the same with the exception of providing a fly wheel of the form described. The device is also extremely efficient in practical use and owing to its simple construction it will be obvious that the cost of manufacture is small.

While I have shown and described the preferred construction and arrangement of the various parts, it will be understood that the invention is susceptible of considerable modification without departing from the essential feature or sacrificing any of the advantages thereof.

Having thus described the invention what is claimed is:—

1. The combination with an engine having inlet and exhaust ports, of a fly wheel for said engine provided with a plurality of peripheral pockets, a case for the fly wheel having a portion of its annular wall eccentrically disposed with relation thereto to provide a passage of gradually restricted area from one end to the other thereof, a conducting pipe connecting the exhaust of the engine to the fly wheel case at a point opposite said passage and adapted to discharge the exhaust into the pockets of said wheel, and an exhaust pipe connected to the other end of said passage.

2. The combination with an engine having inlet and exhaust ports, a fly wheel for said engine, a plurality of inclined blades arranged in the rim of the fly wheel and forming pockets therein, a case for the fly wheel formed in two sections, one of said sections having its annular wall disposed concentric to the fly wheel and in close relation thereto and the other of said sections having its annular wall eccentrically disposed with relation to said fly wheel to form a passage between the same and the fly wheel of a gradually restricted area from one end to the other thereof and merging into and forming a continuation of the space between the annular wall of the first named case section and the fly wheel, a conducting pipe connected to the exhaust of the engine and to the first named case section, and an exhaust pipe connected to the larger end of said passage.

3. The combination with an engine having inlet and exhaust ports, of a fly wheel for said engine, a plurality of inclined blades arranged in the rim of the fly wheel and forming pockets therein, a case for the fly wheel formed in two sections, one of said sections having its annular wall disposed in concentric relation to the fly wheel, the other of said sections having its annular wall disposed in eccentric relation to the fly wheel, a plate arranged in said latter section between the side walls thereof and extending in concentric relation to the fly wheel and forming one wall of a passageway between

the fly wheel and the annular wall of said case section, a conducting pipe connected to the exhaust of the engine and to the annular wall of the first named case section to direct the exhaust fluid into the pockets of the fly wheel, said case section having a discharge neck formed upon its annular wall and constituting a continuation of the pas-

sage in the latter case section, and an exhaust pipe connected to said discharge neck. 10

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

CHARLES A. BLUME.

Witnesses:

SYLVA R. BALTHASER,
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