(No Model.) 2 Sheets—Sheet 1.

J. BRADLEY.

GAS ENGINE SPEED REGULATOR.

No. 386,233. Patented July 17, 1888.

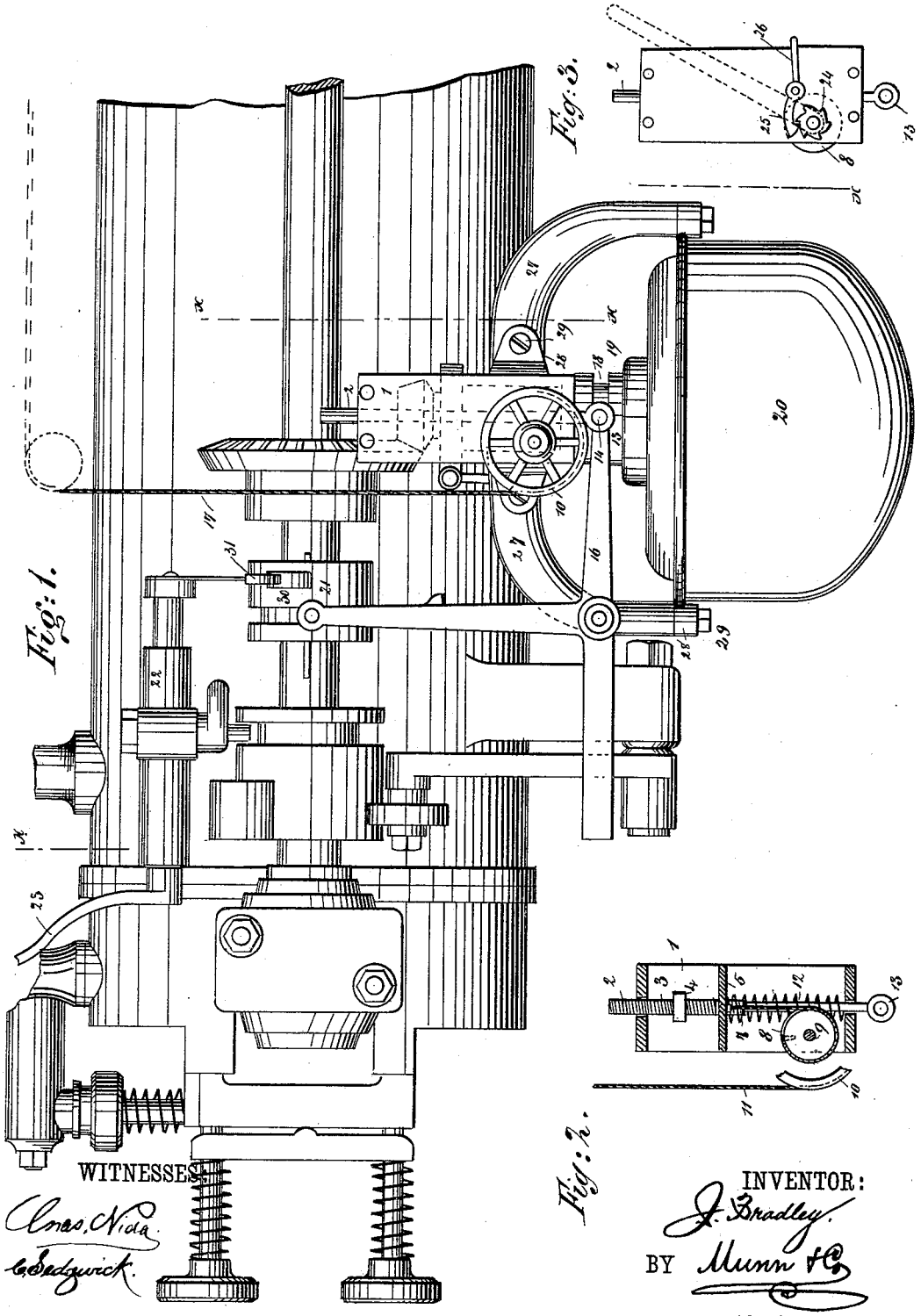

Fig. 1.

Fig. 3.

Fig. 2.

WITNESSES:

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(No Model.) 2 Sheets—Sheet 2.

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Fig: 4.

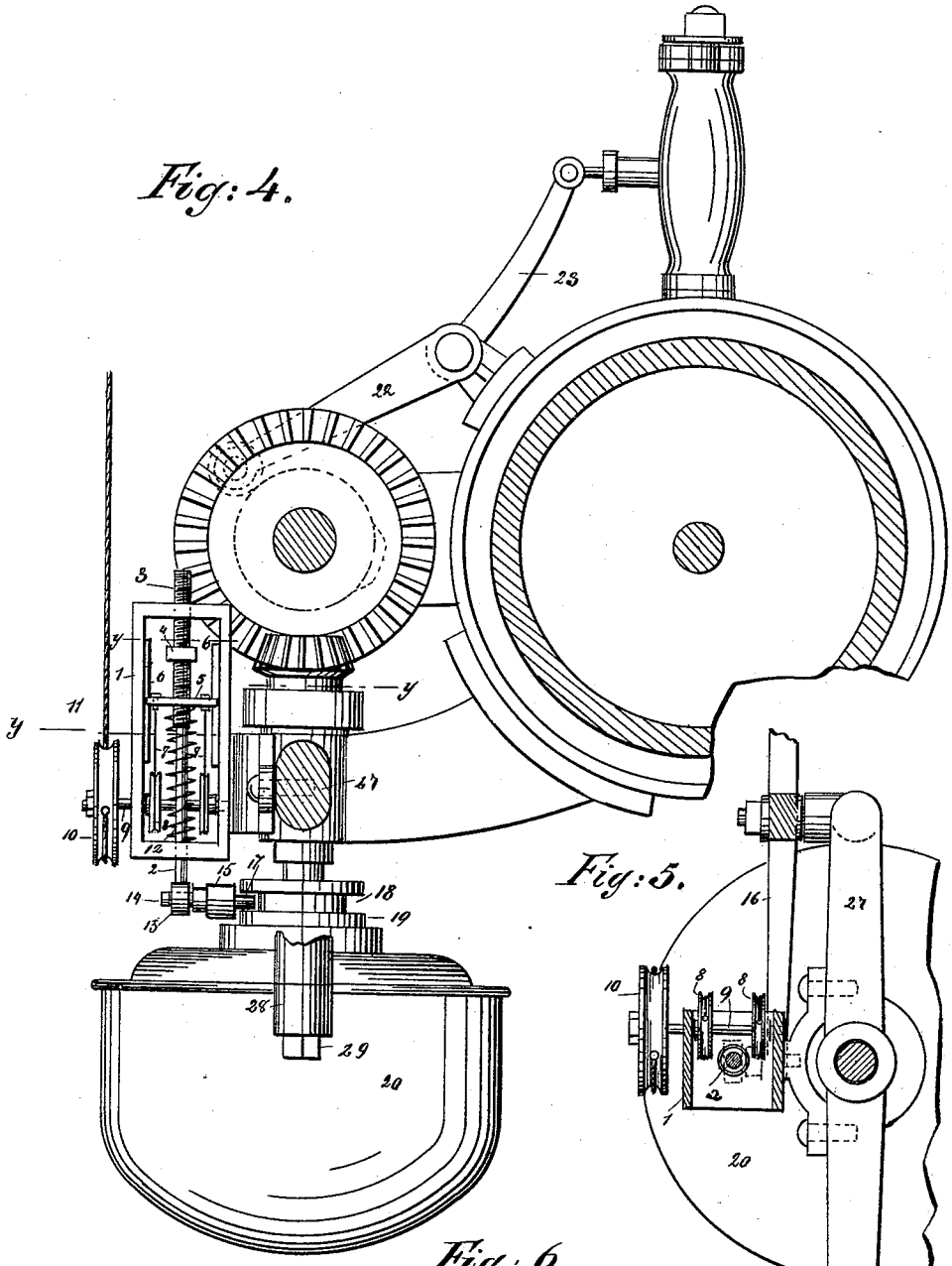
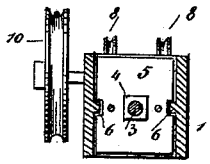


Fig: 5.

Fig: 6.



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UNITED STATES PATENT OFFICE.

JOHN BRADLEY, OF PHILADELPHIA, PENNSYLVANIA.

GAS-ENGINE SPEED-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 386,233, dated July 17, 1888.

Application filed October 29, 1887. Serial No. 253,690. (No model.)

To all whom it may concern:

Be it known that I, JOHN BRADLEY, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and Improved Gas-Engine Speed-Regulator, of which the following is a full, clear, and exact description.

This invention relates to a device to be attached to a gas-engine and connected with the gas-supply valve, whereby the speed of the engine may be regulated and the supply of gas decreased.

The invention has for its objects to reduce the speed or almost stop the engine when the power from the engine is not being used, and also to avoid the waste of gas which occurs when the power is not being used and the engine is running.

The regulator is especially adapted to be used on what is known as the "Otto Gas-Engine." Engines of this class have had to run at one hundred and sixty revolutions a minute, and when the power of the engine was not used and it was not advisable to stop the engine there was no way of decreasing the amount of gas used—as, for example, while the engine is attached to an elevator, when the elevator is stopped for a time, the engine still runs at full speed, using the same amount of gas.

By means of the invention hereinafter described the speed of the engine may be lessened and a great saving of gas thereby attained. In addition to this, the engine is enabled to gain full speed in less than half a minute.

The invention consists in a regulator for this purpose attached to a gas-engine, and constructed and arranged as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 shows the regulator attached to an Otto gas-engine, partly broken away. Fig. 2 is a detail view showing the casing of the regulator in section and operating-wheel broken away. Fig. 3 is a modification showing a pawl and ratchet and crank for controlling the regulator. Fig. 4 is a vertical section taken on line $x\ x$ of Fig. 1, showing the regulator attached to the engine. Fig. 5 is a plan view on the line $y\ y$ of Fig. 4, showing parts in section and broken away; and Fig. 6 is a detail showing the regulator in plan view.

The regulator consists of a metallic casing, 1, secured to the arms 27 of the governor-casing 20 by means of brackets 28 and screws 29, and having a sliding rod, 2, mounted therein and screw-threaded at its upper portion, as at 3, and provided with a nut, 4. The rod 2 passes through a cross-bar, 5, which slides upon ribs 6, mounted on the interior of the casing 1, and is connected by cords 7 with grooved pulleys 8, mounted on an axle, 9, carrying a grooved wheel, 10, to which is secured a cord, 11, connecting with an elevator-starting bar. (Not shown.) A coil-spring, 12, is located on the rod 2 between the end of the casing 1 and the cross-bar 5. The lower end of the rod 2 is provided with a sleeve, 13, which engages a pin, 14, mounted in a sleeve, 15, on the end of a crank-lever, 16. The end 17 of the pin 14 engages a groove, 18, in the collar 19, to which are connected the governors inclosed in the casing 20. It will be seen by this construction that the collar 19 may have a rotary motion and also be lifted by the pin 14. The arm 16′ of crank-lever 16 has a pin, 17′, located in a slot, 21′, encircling the sleeve 21, which is adapted to slide on the shaft 22′ and to rotate with said shaft by means of the spline 23′, located in a slot in sleeve 21. The latter has a cam-shaped projection, 30, which moves under the end of lever 31 with the sleeve 21 when the engine is in motion. The lever 31 forms one arm of a double-crank lever, 22, the other arm, 23, of which is connected with the gas-supply valve. When the engine is running, the action of cam 30 is such as to intermittently lift lever 31 and open the supply-valve, the end of the lever 31 during the remainder of the revolution of sleeve 21 resting on the latter with the supply-valve closed. When the engine-governors are raised, the arm 16′ of lever 16 moves the sleeve 21 to one side, so that the end of lever 31 rests on sleeve 21 out of the path of cam 30, and the cam 30 ceases to act on lever 31, the supply-valve thereby remaining closed.

It will be seen that when an elevator is

stopped by slacking off the cord 11 the cords 7 are unwound from the pulleys 8 and the cross-bar 5 is pushed up by the tension of the spring 12, and, coming against the nut 4, raises the rod 2, and thereby draws on the pin 14, which lifts the collar 19 and raises the governors, and at the same time, by means of the crank-lever 16 and its connection with the gas-supply, wholly or partly cutting off the latter. By this means when the elevator is stopped the engine may be moving at reduced speed and the supply of gas will be decreased. Upon pulling on the cord 11 the cords 7 will be wound on the pulleys 8 and the cross-bar 5 will be drawn down, compressing the spring 12, thereby removing the pressure on the collar 19, and allowing the governors to drop down and gas to enter the engine until it gains full speed.

Where the regulator is not attached to an elevator, the cord 11 may be dispensed with and the shaft 9 be provided with a ratchet, 24, with which a pawl, 25, on a lever, 26, engages. The pulley 10 in this instance may be provided with a suitable lever to operate it, as shown in dotted lines in Fig. 3.

When it is necessary to allow the engine to run at full speed, the pawl 25 is released from the ratchet-wheel 24 and the pulley operated by the lever, as in the case of the elevator-cord.

While I have shown this device applied to a gas-engine, it may be employed with some forms of steam-engine governors.

I do not confine myself to the precise construction of parts in the regulator, as other forms of construction may be employed.

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

1. A speed-regulator for engines, consisting of a frame attached to an engine, provided with a sliding rod with sleeved end, an adjustable stop, a sliding cross-bar having operating cords and pulleys and a retracting-spring, with a main operating-pulley on the shaft of the operating-pulleys, and means, substantially as described, for controlling the same, the sleeved end of the sliding rod engaging a pin located in a grooved collar connected with the governors, said pin being connected with mechanism for opening and closing the supply-valve of the engine, substantially as shown and described.

2. A speed-regulator for engines, consisting of the frame 1, sliding rod 2, nut 4, spring 12, sliding bar 5, ribs 6, cords 7, pulleys 8, shaft 9, and wheel 10, substantially as described.

3. The combination, with an engine motive-force-supply-controlling mechanism consisting of crank-lever 16, having sleeve 15, sliding sleeve 21, having cam 30, and slot 21′, engaging pin 17′ on lever 16, double-crank connection 22, having arm 31, resting on cam 30, and arm 23, connected with the supply-valve, of a speed-regulator consisting of the frame 1, having sliding rod 2, with sleeve 13 engaging pin 14, projecting through sleeve 15 on lever 16, and engaging groove 18 in collar 19, connecting with the governors, nut 4, ribs 6, spring 12, sliding bar 5, cords 7, pulleys 8, shaft 9, wheel 10, and ratchet 24, pawl 25, and handle 26, substantially as described.

JOHN BRADLEY.

Witnesses:
WM. GREENHAWLK,
NELSON YOUNG.