H. ROUX.

REDUCING OR PRESSURE REGULATING VALVE FOR STEAM ENGINES AND THE LIKE.

APPLICATION FILED JULY 20, 1908.

940,195.

Patented Nov. 16, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

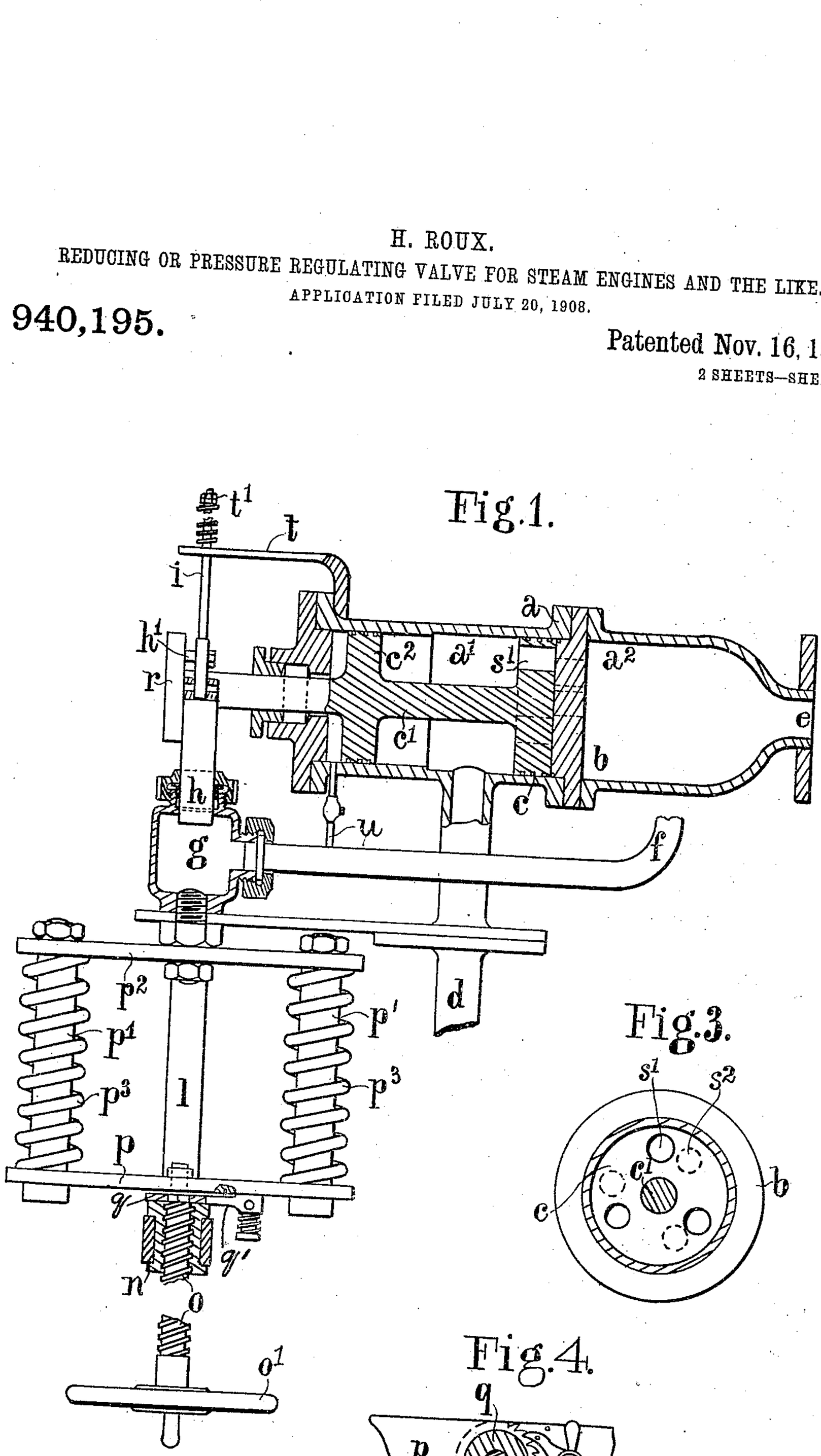
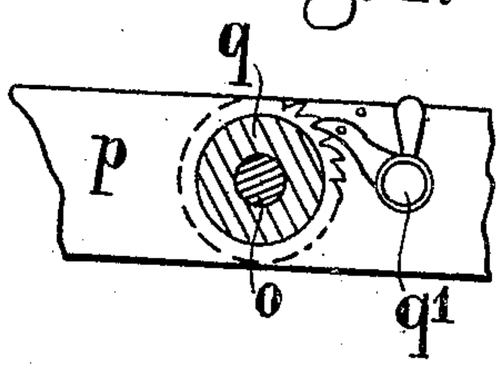


Fig. 3.

Fig. 4.



Witnesses:
L. E. Berkley.
L. A. Sands.

Inventor:
Henri Roux.
by James Ackerman
atty.

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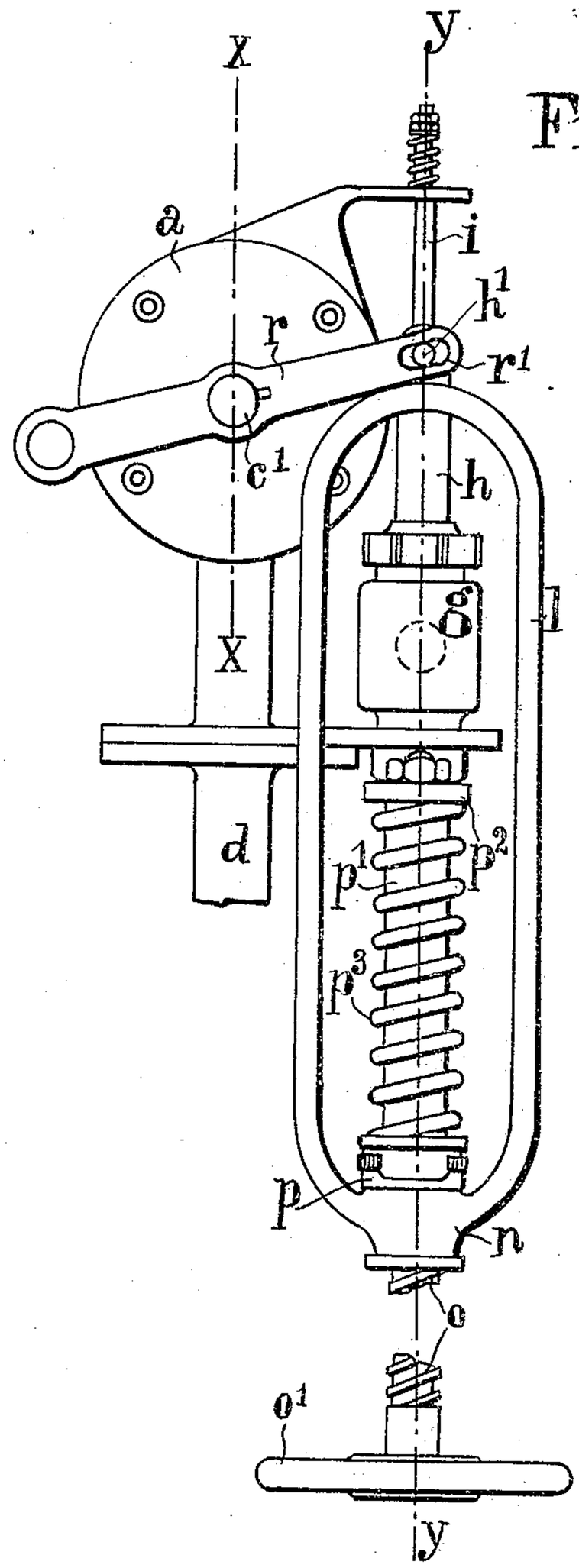
2 SHEETS—SHEET 2.

Fig. 2.



Witnesses:
L. E. Barkley.
L. A. Sands.

Inventor:
Henri Roux.
by Frank S. Ackerman
Atty.

UNITED STATES PATENT OFFICE.

HENRI ROUX, OF MARSEILLE, FRANCE.

REDUCING OR PRESSURE-REGULATING VALVE FOR STEAM-ENGINES AND THE LIKE.

940,195. Specification of Letters Patent. Patented Nov. 16, 1909.

Application filed July 20, 1908. Serial No. 444,453.

To all whom it may concern:

Be it known that I, HENRI ROUX, a citizen of the French Republic, and resident of 13 Rue Albrand, Marseille, France, engineer, have invented certain new and useful Improvements in and Relating to Reducing or Pressure-Regulating Valves for Steam-Engines and the Like, of which the following is a specification, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in pressure regulating or reducing valves and consists essentially in the arrangement of the valve-box, which is inserted between boiler and engine, with a revolving perforated disk, coöperating with a fixed perforated disk the former being mounted on a shaft, which is connected to a spring controlled piston, sliding in a chamber connected with the engine-part of the valve-box, the arrangement being such that under ordinary circumstances the perforations of the revolving disk will be in register with the perforations of the fixed disk, allowing steam to flow to the engine. When the pressure becomes excessive the regulating piston will be operated against the action of its controlling springs and turn the revolving valve disk so as to disconnect the boiler from the engine. The piston will be returned to the original position by the action of its springs and remain in the same till the pressure in the boiler has sunk to the level, determinated by the compression or tension of the controlling springs, which can be adjusted for varying pressures.

I will now describe my invention with reference to the accompanying drawings in which my invention is shown by way of example and in which:—

Figure 1 shows a front view of my invention, partly in sections on lines X—X and Y—Y of Fig. 2. Fig. 2 shows an end view of same. Fig. 3 shows the revolving valve disk. Fig. 4 shows a detail of the arrangement for adjusting the controlling springs.

In carrying out the invention I provide a valve-box a which is subdivided into two compartments a', a^2 by a partition b suitably secured to, and between sections or castings forming said valve-box. A shaft c', suitably mounted or journaled in position is provided with disks c and c^2 arranged within the chamber or compartment a'', the disk or valve c serving as a valve and being seated against the partition b and the other disk being arranged near the opposite end of the valve-box and forming that end-wall of said chamber or compartment. The chamber a' of the valve-box communicates with the boiler by the pipe d. The other chamber a^2 of the valve-box which is separated from a' by the partition b is provided with an outlet e by means of which it communicates with the engine and is connected by a tube f with a compartment g in which a piston h slides. The piston h carries the upper part of the frame l which frame l is provided with a nut n at its lower end. A screw o with hand-wheel o' travels in the said nut and carries at its upper end a cross-bar p the circularly recessed ends of which slide on vertical rods p' the enlarged lower ends of which support the bar and which rods are fastened to an upper cross bar p^2, which is parallel to p and is suitably fixed to the frame of the machine. As it is shown in the accompanying drawings the bar p^2 is fixed to the case of the compartment g which is fixed to the frame of the machine.

Compression springs p^3 are arranged on the rods p' which compression springs have the tendency of lowering bar p and with same, through the engagement of screw o with nut n, frame l and rod i so that by the action of said springs p^3 the piston or plunger h is impelled toward the interior of compartment g. A ratchet wheel q arranged on the screw o engages with a spring controlled pawl q' arranged on the underside of bar p and prevents the screw o from automatically traveling backward (Fig. 4). When the screw is desired to be withdrawn the pawl can be turned by hand so as to come outside the range of gear wheel q. It is evident from the above that by screwing screw o into the nut n the bar p will be lifted and the springs p^3 compressed, their action on the piston h being thus augmented.

The controlling piston or plunger h is suitably provided with a pin h' which engages with slot r' of arm r. This arm r is keyed or otherwise fastened to the shaft c' in such a manner that an up or down movement of the plunger h will turn arm r and with same shaft c' by means of pin h' and slot r. The valve c and the partition d possess each an equal number of holes or perforations s' and s^2 respectively, which under

ordinary circumstances are in register with each other. When however the piston *h* performs an upward movement it will turn disk *c* by means of arm *r* and shaft *c'* in such a manner that the full parts of disks *b* and *c* will cover the holes *s'* and s^2. The device works in the following manner. Under ordinary circumstances the holes *s'* and s^2 will be in register with each other and steam will pass from the boiler through pipe *d* and chamber *a'*, holes *s' s²* to chamber a^2 and from there through outlet *e* to the engine, at the same time into pipe *f* and compartment *g*. The compression springs will be adjusted so as to be powerful enough to hold plunger *h* in its low position in compartment *g* against a certain predetermined steam pressure. If this pressure is exceeded plunger *h* will be lifted against the action of springs p^3 and in traveling upward will turn disk *c* so that the holes in the two disks will be covered and the connection with the engine interrupted. As immediately afterward pressure will fall in compartment a^2 plunger *h* will return to its original position and valve be open. But the plunger will subsequently travel upward and shut valve *b*, *c* again if the pressure in the boiler has not fallen.

A spring *t'* arranged between the end of a rod *i* connected to plunger *h* and a bracket *t* serves to cushion the downward movement of the plunger. The plunger *h* will not come to rest before the pressure in the boiler is reduced to the level for which the springs are adjusted.

A pipe *u* with a tap may be provided for connecting tube *f* with the space between disk c^2 and the end of the valve-box, so as to allow equal pressure to be exerted on the outside and inside of the valve.

Modifications may be made without thereby deviating from the principle of the invention.

The chief advantages of my invention are minimum wear, greatest sensitivity, strong construction and reduced liability of the valve-parts to break, no travel of valve taking place but a slight turn only.

What I claim and desire to secure by Letters Patent is:—

1. In a reducing valve, a valve box, a ported partition dividing the valve box into a main and a supplemental chamber, a valve stem having a rotary valve disk formed with ports registerable with the ports of the partition, said valve stem and valve disk being located in the supplemental chamber, a packing member on the valve stem spaced apart from the rotary valve disk, a supply pipe connected with the supplemental chamber between the rotary disk and the packing member, an arm connected with the outer end of the valve stem, a plunger engaging the arm, a cylinder for the plunger, a pipe connecting the main chamber with a plunger cylinder, and means for holding the plunger under tension.

2. In a reducing valve, a valve box, a ported partition dividing the valve box into a main and a supplemental chamber, a valve stem in the supplemental chamber having a rotary valve disk formed with ports registerable with the ports of the partition, a packing member on the valve stem spaced apart from the valve disk, a supply pipe connected with the supplemental chamber between the disk and the packing member, an arm connected with the outer end of the valve stem, a plunger engaging the arm, a cylinder for the plunger, a pipe connected with the main chamber and the plunger cylinder, a frame connected with the plunger, parallel spaced bars arranged on the frame, springs engaging the spaced bars, and a screw for adjusting the springs.

In witness wheheof I have hereunto set my hand in presence of two witnesses.

HENRI ROUX.

Witnesses:
ALPHONSE LE FAVEE,
MARIUS MAROPNIER.