

## New Inventions.

## Machinery Wanted.

Mr. John A. Leclerc, of Montreal, Canada, writes to us for information in regard to machinery for making shoe pegs, also for lathes for turning lasts, ax handles, &c., also a boot crimping machine. There are such machines in this country, and there would be no difficulty in getting them into the Canadas if the government would extend proper protection to the inventor. As it now is, inventors in the United States, deprived of all opportunity to secure their inventions by patent in these provinces, are not over anxious to sell machines to go there, and thereby create a competition which they have not the legal power to regulate.

## Improved Coal-Burning Locomotive.

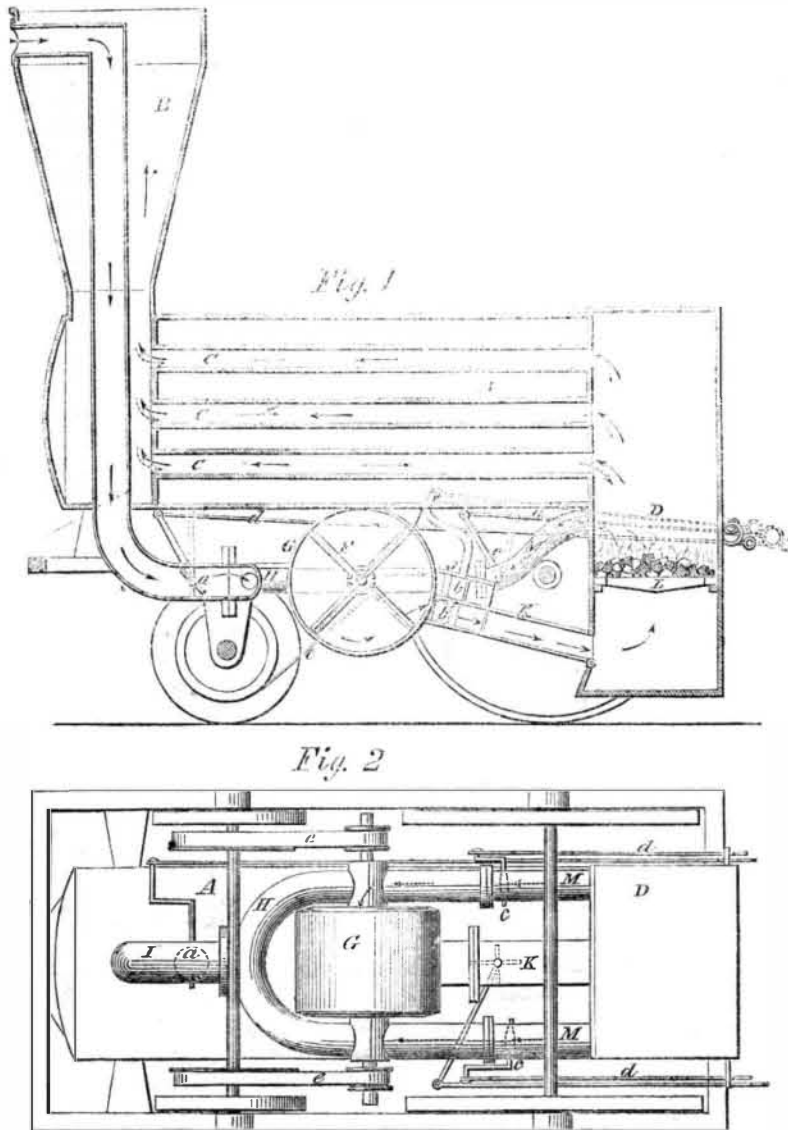
This is an arrangement for regulating the amount of air which is supplied to a coal-burning locomotive, and supplying the air at the requisite speed and pressure by means of a fan blast. Our engravings illustrate fully the invention, Fig. 1 being a longitudinal vertical and central section, and Fig. 2 being an inverted plan of the improvement. The great difficulty which has hitherto been experienced in the use of coal-burning locomotives is, that anthracite requires a strong blast to consume it quick enough to throw out the requisite quantity of heat, and the blast created by the escape steam is not enough for this, therefore some extraneous means, such as a fan-blower, has to be employed. This invention consists in an arrangement of such a fan-blower placed underneath the boiler of the locomotive, and connected with pipes which are provided with valves, and so arranged that the fire may be supplied with a greater or less quantity of air as desired, and when necessary a reverse draft brought down through the flues and the upper part of the fire chamber, in order to lessen the temperature of the boiler.

A represents the boiler of a locomotive. B is the smoke-pipe. C represents the flues which pass longitudinally through the boiler from the fire chamber, D, to the smoke pipe, B. Underneath the boiler a fan, F, is placed. This fan is fitted in a proper box, G, which connects at the center of each side, with a curved pipe, H, the pipe being connected with a pipe, I, which is fitted within the smoke-pipe, B. The way in which pipe, I, is made to communicate with the fan-box is plainly shown in Fig. 2. A valve, *a*, is fitted in pipe, I, near its junction with pipe, H. From the periphery of the fan-box, G, two pipes, J K, project, the lower pipe, K, passes into the fire chamber below the grate, L, and the end of pipe, J, communicates with the open air. The pipes, J K, have valves, *b b'*, fitted or placed on them; these valves, *b b'*, are placed on a common rod or axis, and in reverse positions the valve, *b'*, being open, when *b* is shut, and *vice versa*. M M represent two pipes, one end of which communicates with the fire chamber above the grate, L, and their opposite ends are open to the sides of the fan-box, G. Each pipe, M, is provided with a valve, *c*, the valves of the several pipes all have rods, *d*, attached, which rods extend back at the sides of the fire chamber and within reach of the engineer. The fan, F, is driven by belts or chains, *e*, from the truck axles, the belts being enclosed within proper cases to exclude dust, and thereby prevent the wearing or "cutting out" of them.

The operation is as follows:—When an intense heat is required, the valves, *c c*, in the pipes, M M, are closed, and the valve, *b*, in the pipe J is also closed, *b'* in the pipe, K, being open. The fire will then be supplied with a blast which passes down the pipe, L, through the curved pipe, H, into the fan-box, G, and thence through the pipe, K, into the fire chamber, D, below the grate, L, and through

the flues, C, into smoke-pipe, B—see arrows. The strength of this blast may be regulated by adjusting the valves, *a b'*. When the temperature of the boiler requires to be reduced, the valves, *a b'*, are closed, and the valve, *b*, in the pipe opened, and the valves, *c*, in the pipes, M M, also opened. The blast will then pass in the direction of the dotted arrows, down the smoke-pipe, B, through C into D, from thence through M into G, where the fan,

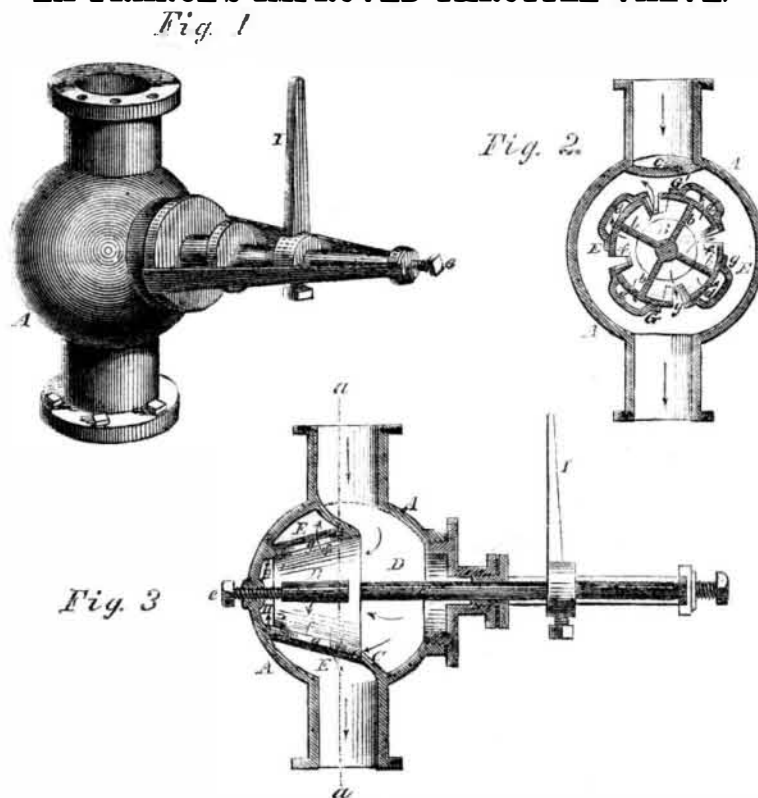
## HARTNETT'S COAL-BURNING LOCOMOTIVE.



discharges it into the atmosphere through the pipe, J. This reverse draft cools the flues, and so reduces the temperature of the boiler. By this arrangement the fire of a coal-burning locomotive is placed entirely under the control of the engine driver, and the heat can

be graduated as desired. This plan is a great improvement on the usual one, which is closing the flues and ash pan with dampers. It is the invention of J. M. Hartnett, of Wauconda, Ill., from whom any further information can be had. It was patented July 21, 1857.

## LA FRANCE'S IMPROVED THROTTLE VALVE.



The improvements which constitute the advantages of this throttle valve will be appreciated from the following description, reference being had to the illustrations, of which Fig. 1 is a perspective view, Fig. 2 a vertical

section across the axis, and Fig. 3 a section parallel with the axis.

A is a spherical chamber, containing the valve, B. It is divided by the partition, C C, into the compartments, D and E, one for the

admission of steam into the valve, and the other for the passage of steam from the valve ports to the steam-chest. The latter is annular, and surrounds the valve, as seen at E, Fig. 3. The valve is in the form of a hollow frustum, being supported on the axis, F, by four arms or partitions, *b*, which also serve to strengthen against any unequal pressure that it may receive.

The valve seat consists of a shell surrounding the valve, and fitting it closely. It is joined to the partition, C, at one extremity, and to the case, A, at the other. In it are four recesses or passages, *d d*, extending from the chamber, D, and uniting in a single chamber, H, at the end of the valve. The valve stem or spindle is packed and supported in the usual manner, having an adjusting screw at each end, *e e*, to regulate its pressure on the seat; and I is the lever for connecting it with the governor. The valve has four oblong ports or openings at its sides, *f f*; and there are corresponding openings in the seat, *g g*, between the recesses, *d d*.

The steam enters from the boiler into chamber, D, filling the interior of the valve, and also the passages, *d*, and chamber, H. As the ports are opened, it passes into the annular passage, E, surrounding the valve seat, and thence to the steam chest. The course of the steam, both in its passage through the valve and through the surrounding chamber, is indicated by arrows. The adjoining surfaces of the valve and seat are grooved, so as to constitute a steam-tight joint, and the adjustment of steam in and upon the valve is such as to reduce friction to a minimum rate, and thus produce what may be called a balanced valve. The pressure of the steam on a considerable portion of the exterior surface of the valve, by means of the passages and chamber, *d* and H, tends to overcome friction, and makes it sensitive in a high degree, while the interior arrangement is such that the force of the steam in escaping by one port, is counterbalanced by the same force in the opposite positions of the four different ports. The supporting partitions, *b*, receive the back pressure of the steam and throw it upon the center, and form in fact four equal and distinct passages for the steam to the ports. The considerable area of the four ports and their united action produce an extreme degree of sensibility and a very slight turn of the valve varies the opening greatly. So rapid and perfect is its operation that it is difficult to detect a difference in its revolution, when suddenly changing from light to heavy labor of the engine, and *vice versa*.

It was patented April 13, 1858, by the inventor, T. S. La France, of Elmira N. Y., who will furnish any further information upon being addressed as La France & Colman, of the same place.

## Wonders of Photography.

H. Garbanati, in an article on this subject in the *American Journal of Photography*, tells us the following:—

"I was recently handed two small pieces of glass, in the center of each was a dark object, about a quarter of an inch square. In the center of the square of one of these, by dint of close and painful examination, I discovered a speck about one-sixteenth of an inch diameter, which bore somewhat the resemblance to a portrait of a head. In the other was also a speck about one-eighth of an inch, and some other very minute specks in the one speck, but which I could not recognize as any particular objects. By holding the first piece of glass up to the light, and looking through a powerful magnifier, I discovered a perfect portrait of about a sixth size, and in the other a group of five equally perfect, of about half size. To what use might not this mode of photographing be put? In war the most elaborate instructions might be carried in a button or head of a pencil-case; and the general or secretary of war needs but a magnifying glass to save the use of spies and men from hanging. The whole archives of a nation might be packed away in a snuff-box. Had the art been known in the time of Omar, the destruction of the Alexandrian library would not have been a final loss."