

IMPROVEMENT IN STOVES.

The cone attachment shown in the annexed engraving is designed to economize fuel, improve combustion, and to utilize to the fullest extent the heat of the fire. A hollow cylinder, A, having a conoidal top and two radial pipes, B, is supported in the center of the fire pot of a stove or furnace a short distance above the grate by lugs which rest on a spider supported by the lining or side of the stove or furnace. There is sufficient space between the cylinder and the grate to allow the grate to move freely.

The pipes, B, are connected with segmental covered hot air boxes, C, resting on the stove lining and against the inner side of the stove. The inner and outer faces of these boxes are apertured and provided with sliding registers, D, which are connected together and have their apertures arranged in relation to those of the boxes, so that when communication is established between the interior of the boxes and the external air, communication between the interior of the stove or furnace and the boxes is shut off, while a movement of the register in the reverse direction will establish communication between the boxes and interior of the stove. Air is admitted beneath the grate into the cylinder, A, and through the connecting pipes, B, into the hot air boxes, C, becoming highly heated in its passage. Then, by adjusting the registers, the heated air may be admitted into the room in which the furnace or stove is located, or by simple arrangement of pipes may be conducted to any other room in the house. A contrary movement of the register will direct the current of hot air from the boxes into the stove or furnace itself.

When raking down or replenishing the fire in the stove or furnace the inner perforations of the hot air boxes are closed by the register to prevent the entrance of dust and ashes.

In a stove or furnace the cylinder occupies the space that would otherwise be occupied with coal, so that with an equal amount of coal placed in a stove or furnace about the cylinder more extensive heat-radiating surface is secured than there would be in the absence of the cone. As the economic value of coal in a house furnace or stove is in a great measure controlled by its exposed radiating surface, this device must serve to increase the heating capacity of the coal.

This invention has been patented by Mr. J. H. Egan, of St. Johnsville, N. Y., who may be addressed for further information.

Native Californian Tobacco.

Professor J. T. Rothrock is of the opinion that the early natives of California smoked the leaves of *Nicotiana clevelandii*—a species only quite recently described by Professor Asa Gray. It is a small plant with small flowers, and it was found by Professor Rothrock only in association with the shell heaps which occur so abundantly on the coasts of Southern and Central California. He states that perhaps of all the remains of extinct races so richly furnished by that region, none were so common as the pipes, usually made of stone resembling serpentine. The tobacco of *N. clevelandii* Professor Rothrock found by experience to be excessively strong.

IMPROVED CAR STARTER.

In the traffic of a great city like New York or Philadelphia it is no uncommon thing to see a pair of horses toiling up a grade with a car loaded to its utmost, the horses pulling almost to the limit of their strength, and when the car is stopped, as it necessarily is at very short intervals, it becomes evident that extraordinary exertions are required on the part of the horses to overcome the inertia of the heavy load and to get the car again in motion. The position of the horses, the slipping of their shoes on the pavement, and the tension of the traces all indicate that a great deal of power is required to start a car by a direct pull, and any observing person must have noticed that it requires a great deal of maneuvering on the part of the driver to release the car brake at the precise moment when the horses begin to pull. The fact is this is seldom or never accomplished, the brake being usually relieved before the horses have fairly started; the consequence is that there occurs a retrograde movement of the car, which adds to the momentum acquired by the backward movement the inertia of the load, making the matter of starting much more difficult than it would be if it were possible to start from a state of rest.

The case is the same on level roads, although not in the

same degree; and, added to the effects already mentioned, there is the jerking of the passengers whenever the car is started, the racking of the cars, which results in their rapid destruction, the strain on the harness, the frequent loss of the horses' shoes, the latter being a matter of considerable importance, since the horse suffering this loss must wear a boot and go at a slow pace, often seriously delaying the entire line of cars following.

Most of what has been said in relation to street passenger cars is equally applicable to coal cars, mining cars, and railroads of every description employing horse flesh as a motive power.

It is certain that more damage is done to horses in start-

of the car, and a lever, A, which embraces the axle on each side of the ratchet and carries a pawl capable of engaging the ratchet when the free end of the lever is raised. The lever, A, is connected by a short link with a bell crank lever, B, pivoted in bearings suspended from the bottom of the car. The lever, B, is connected by a rod, C, with the drawbar, D, having a spring surrounding it between the two guides, and not differing materially from the drawbars in common use.

The tongue, if one be used, is supported by a vertical rod hinged to the outer end of the draw bar and supported at its lower end by a brace, G, connected with the inner end of the draw bar and provided with adjusting nuts by which the inclination of the tongue may be changed.

The pawl on the lever, A, is connected by a small rod or chain, F, with a lever on the driver's platform, the rod or chain being connected by suitable angled levers. By this arrangement the driver may disengage the pawl from the ratchet by simply pulling on the rod or chain, F, when the motion of the car is to be reversed. When the cars always run in the same direction this pawl will never be raised. When the horses pull, the forward motion of the draw-bar moves the lever, A, upward, and as the pawl is in engagement with the ratchet, the axle is turned and the car started. The direct pull of the horses is thus applied to a car already in motion and never to the dead weight of the inert car. In fact sufficient headway is given to a car by this starter to make it impossible for a balky horse to impede the car after having given one pull. This is very important, as it insures a ready and positive start. The power is then applied directly, in the most advantageous manner, propelling the car forward for from twenty to twenty-seven inches. The drawbar being then pulled out as far as possible, the car is drawn in the usual way, until it is again stopped. In passing around curves this device is especially effective, as it transfers the pull to the middle of the car, thus diminishing the lateral or twisting strain which tends to make the car bind on the track.

The actual saving of power in starting a car with Hansell's car starter is 33 1-3 per cent. If a car is stopped on an up grade, it will be prevented from retrograde movement by the pawl and ratchet, giving the driver the use of both hands and consequently full control of the horses, the brake being entirely unnecessary, and the car will be started from a state of rest.

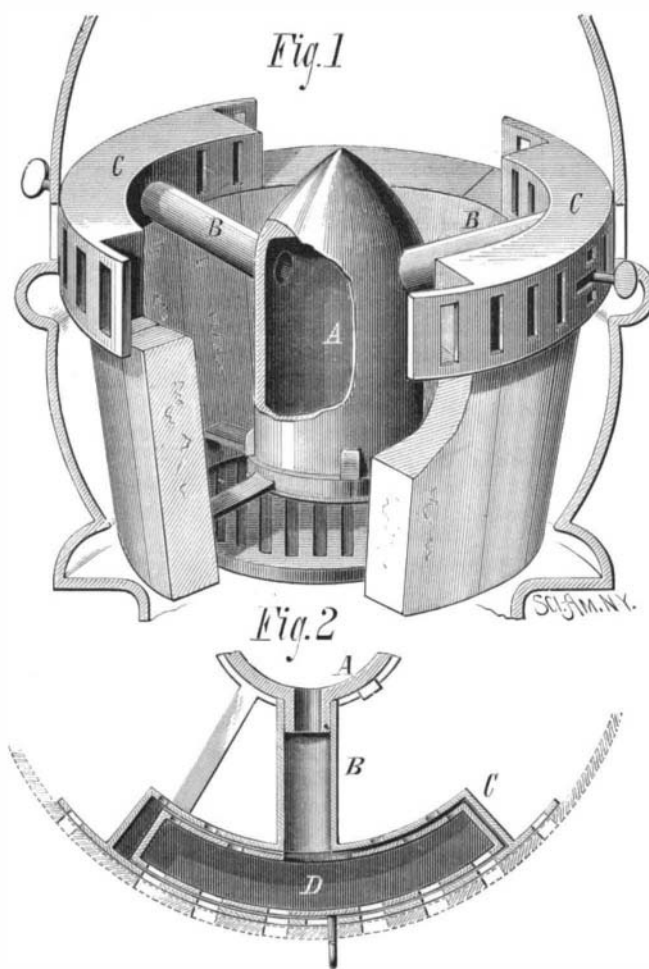
When this starter is applied to a car in the process of construction, the ratchet wheel is simply keyed to the axle; but when it is applied to cars already built, the ratchet wheel is split and is held in place by bolts.

This device relieves the horses of dead weight in starting the car, and renders the operation of car-starting as easy as car-drawing. We are informed that horses with galled shoulders have been rapidly healed while working regularly drawing cars with this improvement attached. This invention may be applied with great advantage to cars propelled by steam, the lever, A, being connected with the draw bar in substantially the same way as in the case of street cars. With steam cars as with horse cars the greatest power is exerted in starting, and the application of this device by reducing the amount of power required to start will permit of using lighter engines in propelling the trains.

This starter not only saves horses from strains which wear them out more rapidly than all the steady work they accomplish, but it saves enough every year in horse-shoes alone to pay for its application to a car, and it relieves the car from the racking strains which loosen the joints of the wood work and cause every window and timber to rattle. It is stated that a car with this improvement attached will last twice as long as a car of ordinary construction which is started by a direct pull in the ordinary way. A first class car costs \$1,000, and, as commonly used, becomes rickety in five years. With Hansell's car starter applied the same car will last at least ten years.

The device requires no attention whatever, needs no oil, and will outlast the car to which it is applied. It is as simple as a piece of mechanism can be to accomplish the work and is always ready for use.

Many attempts have been made to apply to a car apparatus for storing the power lost in stopping, and to expend the power thus stored in starting the car. Other devices have been tried which employ a combination of springs and

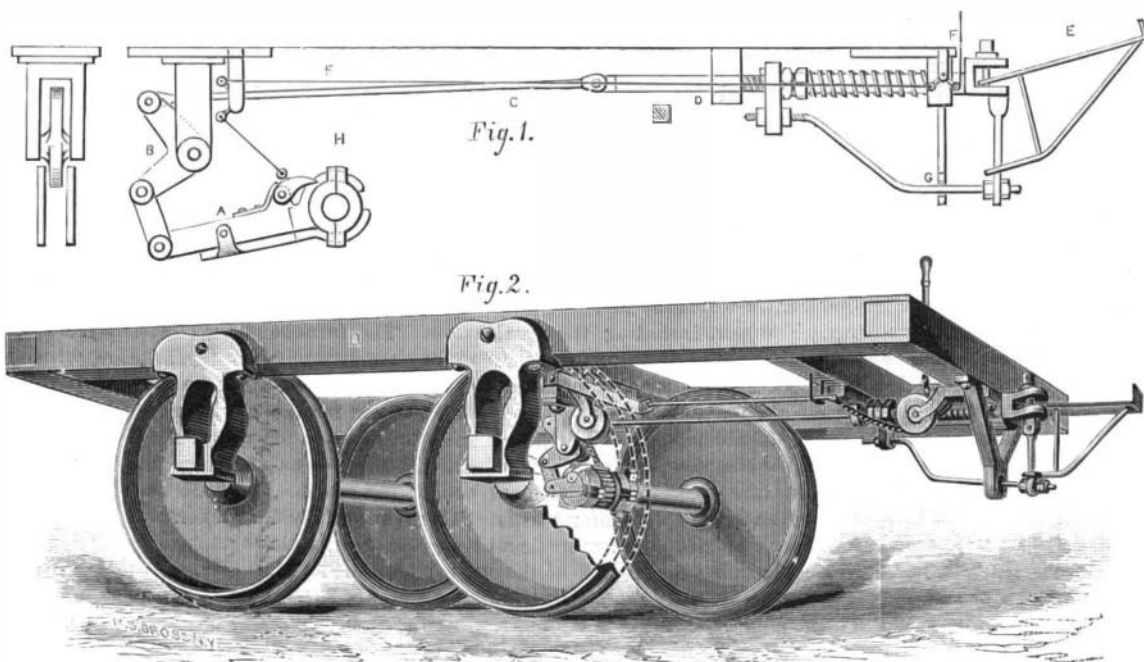


EGAN'S CONE ATTACHMENT FOR STOVES.

ing the cars than in all the actual work done in drawing them along the track, and any invention calculated to avoid these evil effects is worthy of attention.

We give herewith an engraving of a novel car starter recently patented by Mr. Jacob Hansell, of Philadelphia, Pa. It has been practically tested for several months past upon some of the most trying street car lines in Philadelphia, and is found to work admirably, saving the horses from the sudden and severe strains which inevitably come upon them when starting the car in the usual way, and also effecting a great saving in the wear and tear of cars.

The invention shown in the cut is very simple, and may be readily applied to the ordinary cars. If the device is applied to a car while building, a saving of at least \$5 will



HANSELL'S CAR STARTER.

be effected in the construction of the car, as many of the heavier parts which are made especially for supporting the brake while under a heavy strain may be omitted.

Fig. 2 gives a general idea of the manner of applying the starter to a car, and Fig. 1 is a detail view of the starting mechanism. A ratchet wheel is secured to one of the axles