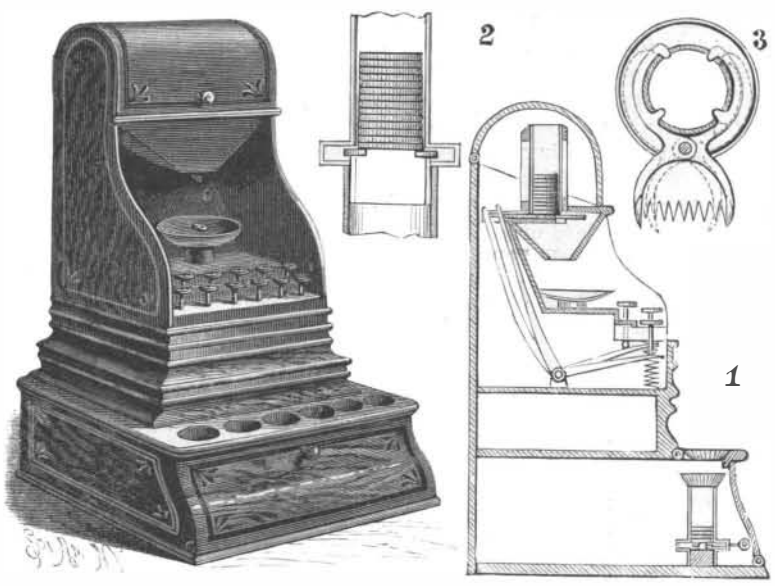
AN IMPROVED CHANGE MAKER.

A device to facilitate the making of any desired amount of coin change is shown in the illustration, and has been patented by Messrs. George M. Hill and Fred P. Alter, of Centralia, Wis. In the upper portion of the casing, which has an inclosing cover,

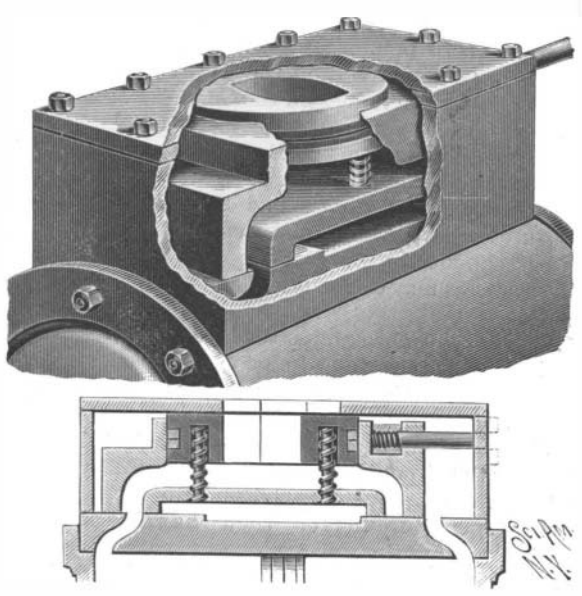


HILL AND ALTER'S CHANGE MAKER AND RECEIVER.

are six tubes adapted to receive the various coins—dollars, fifty-cent pieces, twenty-five-cent pieces, ten-cent pieces, nickels and cents. Each tube has a slot in front, that the coins may be seen, and all the tubes connect at their lower ends with a chute leading to a change table. By means of a push bar or slide, connected at its rear end with the long arm of a bell crank lever, as shown in the sectional view, Fig. 1, the lowermost coin in each tube may be released as desired, upon pressing a key which acts upon the free end of the bell crank lever, the coin then dropping into the saucer-like holder shown. The several keys are marked to indicate the coins in the respective tubes, and a spring holds each of the bell crank levers in such position that the push bar is normally retained out of engagement with the coin. Additional keys are provided, each having at its lower end a bar, by which several levers may be actuated at the same time by a single key, to make collectively a desired amount of change. In order to fill the coin tubes, a receiver is provided in the lower part of the casing, in which is a set of receiving tubes, shown in section and plan views in Figs. 2 and 3. In a circular hollow offset near the lower end of each tube is pivoted a pair of tongs, the handle ends of which are pressed apart by a spring, the inner ends extending into the tube to support a coin dropped upon them. The several tubes are of sizes corresponding with the coins to be received, and when one of the upper tubes is empty it is supplied by removing the filling tube and placing it in the upper tube, when, by pressing upon the handle ends of the tongs, the coins pass out of one tube into the other.

AN IMPROVED BALANCED SLIDE VALVE.

In the upper portion of the valve shown in the illustration is a central vertically movable disk. supported by springs, and provided with an exhaust steam passage. The improvement has been patented by Messrs. John Parker and Fred E. Clark. In the underside of the valve is a recess communicating at its ends



PARKER AND CLARK'S SLIDE VALVE.

with the interior of the steam chest, so that live steam can pass to the underside of the valve. The two exhaust ports terminate in a common port with an elliptical opening in the middle of a balance piston disk in the top of the valve, the disk being pressed upward by springs coiled on rods secured in the bottom of the valve, thus forming a steam-tight joint. The opening in the disk registers at all times with an opening in the cover of the steam chest connected with the usual exhaust pipe, and in the periphery of the disk are held expansion packing rings pressing against the inner surface of an annular flange of the valve. As the area of the valve portions seated on the top of the cylinder, and operating over the ports, about equals the area of the top surface of the balance disk, the valve is completely balanced. This valve requires about one-third less travel than the ordinary slide valve.

Further information relative to this improvement may be obtained of Mr. John Parker, Sturgeon Falls, Ontario, Canada.

Generation of Electric Power in the Coal Fields.

At a recent meeting of the Manchester Association of Engineers, a very interesting paper by Mr. B. H. Thwaite, C.E., of Liverpool and London, was read on the "Economic Possibilities of the Generation of Electro-motive Force in the Coal Fields, and its Application to Industrial Centers." Mr. Thwaite brought before the meeting three projects of electrical transmission of energy generated in the coal fields. The first for supplying the Lancashire centers of industry, and the area adjoining the ship canal; the second for supplying the Yorkshire centers of industry; and the third for supplying the centers of industry in the Midlands and the metropolis.

For generating power for driving electric generating machines they would require high efficiencies with small powers, and a motor of 500 horse power was the largest that should be used for this character of work. The efficiency of dynamos or electric generating machines was so nearly perfect that there was only questionable advantage in building excessively large types, but the motive power and elements should be such that if one or two parts went wrong it would not involve the stoppage of the entire motive power plant; besides, it should be possible to reduce or increase the power of dynamic energy production in proportion to the demand, and with large steam engines of 1,000 horse power and upward this would not be practicable. There was another and important advantage in relatively smaller gas engines. The pulsations of piston effort could be so arranged that their effect on the supply would be inappreciable. In the arrangements of the plant for the projected coal field generation stations, gas motors of 300 brake horse power were intended to be used, a pair of these engines being allotted to each alternating current machine, coupled direct, one driving the armature in one direction and the other the field magnets in a contrary direction.

Mr. Thwaite said that ten years ago he had forecasted that when once the Manchester ship canal was made, its banks would become the future area of new industrial developments, and with a line of power supply, a perfect railway connection, and a means of oversea transmission, it could be stated that no other area in the world would offer such facilities for cheap industrial production as this area would be with the supply of cheap electricity and unlimited energy proposed. To realize the marvelous industrial fecundity of Lancashire and Yorkshire, they had only to glance at the lines of the telephonic system already established and the proposed lines of electric power transmission. There they had the very acme of economy in transmitting thoughts; let them go a step further, and imitate nature by laying down a nervous industrial system to distribute power, and the picture, with the ship canal complete, was perfect, and would be worthy of the enterprise of the counties of the Red and the White Rose.

The chairman, after noting the rapid development made during recent years in the application of electricity, said they could scarcely brand as impossible even the most visionary scheme that might be brought before them in that direction. With regard to the central supply sources suggested by Mr. Thwaite, he thought, however, there were some disadvantages which must not be overlooked. Assuming that there were a thousand sources of engine power, if one source failed, then only one out of a thousand failed; but if there were a thousand motors drawing on one central source and that central source became stopped, then they had a thousand firms stopped simultaneously, and it struck him that the seven millions of horse power they now had in the country in steam engines and boilers would not be replaced by the new force as yet.

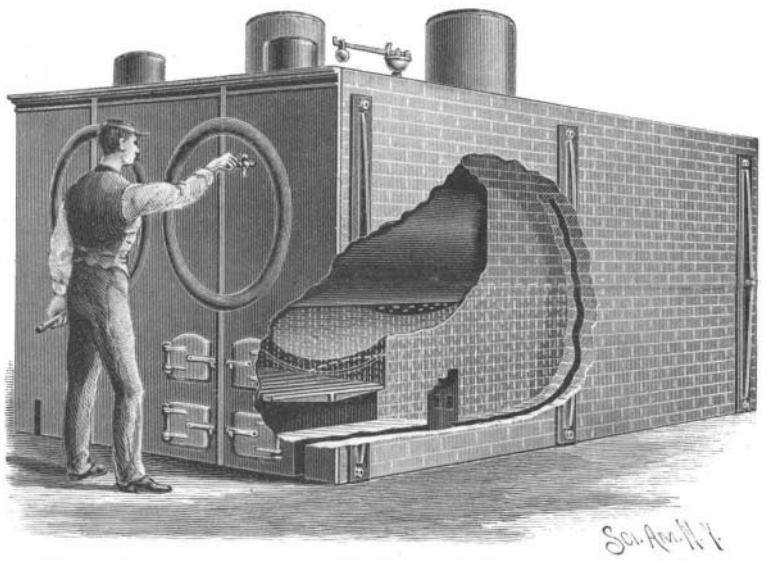
Mr. Brown said, in many establishments where they had replaced their engines by electric motors an immense saving had taken place, and he believed that it was not far from the actual fact to say that, taking an ordinary machine works, where several engines were required, at least 50 per cent of the power would be saved by a central generating station supplying electricity to motors in the various portions of the works, although, of course, the cost of such an installation would be pretty heavy. As to the hygrometric economy of the electric light, there was no question of its being far superior to any other form of light there was.

Mr. Saxon said that one of those questions which they, as practicing engineers, had to face with regard to Mr. Thwaite's suggestions was whether they would have as steady running in their textile factories by driving with electric motors—either of sufficient power to drive the whole of the machinery or perhaps separate motors for each room or story—as with the large engines now in use. His own opinion was that they would not. He thoroughly agreed with the author as to the advantage which would be gained in comparison with small engines. With regard to the cost of the installation, he thought that, what with the excavating, laying special pipes, copper castings, conductors, etc., the author of the paper had underestimated it very much indeed.

Mr. Beastow agreed with Mr. Thwaite that the steam engine in a few more years, especially for small powers, would become obsolete.

AN IMPROVED FURNACE.

A furnace patented by Mr. James S. Ecker, and designed to utilize the fuel to the fullest advantage, is shown in the accompanying illustration. The top of the bridge wall slants upwardly and rearwardly, and is



ECKER AND LAIDLAW'S COMBUSTION ARCH FOR FURNACES.

curved to correspond with the curved top surface of an inverted arch, concentric with the boiler, and forming a segmental space constituting a combustion and radiation chamber just beneath the boiler and extending back to the rear wall. In the rear of the bridge wall, at its base, is an air chamber extending to the rear brickwork and from one side wall to the other, the top of the chamber being arched, and this chamber is connected by numerous openings or ports with the combustion chamber above, formed by the inverted arch immediately under the boiler. Longitudinal ports from the front end of the air chamber lead to a transverse channel in the bridge wall, the latter channel connecting with channels in the side walls of the brickwork which open at their front ends to the air. Suitable doors in the rear of the brickwork give ready access to the air chamber and the combustion chamber to facilitate cleaning when desired. The large body of brickwork forming the arched top of the air chamber and the inverted arch radiating surface beneath the boiler has considerable storage capacity for heat, and in its construction allowance is made for contraction and expansion. The additional supply of air through the ports leading upward from the air chamber is designed to effect a perfect combustion of all smoke and gases.

Further information relative to this improved furnace may be obtained of Messrs. Ecker & Laidlaw, Portland, Oregon.

Ship Canal from the Lakes to the Hudson River.

A bill has been introduced in Congress for the enlargement of the Erie canal, with a view to its conversion into a waterway large enough to admit vessels of considerable size. It is to be 20 feet deep. The cost will be one hundred and fifty millions of dollars. This is a grand project, and would be of immense benefit to the great West. It would make ports of entry for foreign commerce at all the different harbors along the lakes, extending westward 1,100 miles beyond Buffalo.