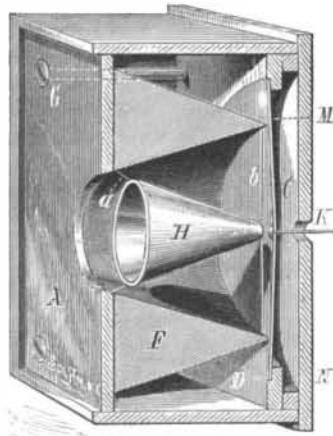


IMPROVED ACOUSTIC TELEPHONE.

The front board, A, of the box is provided with a central aperture. The diaphragm, M, is stretched over the central opening of a board, D, which has strengthening ribs on its under side and along the edges. An annular block of wood, F, whose thickness decreases from the top toward the bottom on the inner as well as the outer side, is placed between the front board and the diaphragm. The upper opening of the block coincides with the central opening of the front board, and the bottom opening is smaller than the opening in the board, D. The bottom edge of the block is pressed upon the diaphragm by bolts, G. In the central opening of the block is a funnel-shaped vessel, H, held in place by



HUSTON'S ACOUSTIC TELEPHONE.

wires, *a b*, at the top and bottom, which hold the lower end of the funnel a short distance from the diaphragm. A button is fastened to the middle of the diaphragm, to which is fastened the wire, K. The funnel concentrates the sound waves and guides them to the diaphragm, thus causing strong and distinct vibrations that reproduce the words very plainly. The diaphragm is formed of alternate layers of skin and a textile fabric.

This invention has been patented by Mr. H. E. Huston, of the firm of Lodge & Huston, of Monticello, Illinois.

The Center-cycle.

We have had brought to our notice, says *Engineering*, a very ingenious apparatus which combines the speed and simplicity of the ordinary bicycle with the stability and safety of the tricycle. This apparatus, to which the inventor, Mr. Edward Burstow, of Horsham, has given the name of center-cycle, is a mechanical roadster, which has the general appearance of an ordinary large wheel bicycle fitted with four smaller supplementary wheels, one pair in front of and one pair behind the center or driving wheel.

Over the center of the large driving wheel is a saddle attached to tubular framing, similar to that in the best bicycles, and the wheel is driven in the ordinary way by means of a pair of cranks fitted with treadles. The steering of the machine is effected by means of a steering handle, which operates, through a curved bar and a Hooke's joint, upon the axle of the forward pair of wheels, which, in its turn, acting through a lever, sets the rear axle to a similar angle, both being in directions normal to the curve along which it is desired the apparatus is to travel. In this respect the action is very similar to that of a roller skate, and is quite as easily and as smoothly controlled.

So far the description would be applicable to an apparatus of the tricycle type, but furnished with five wheels instead of three; but the characteristic feature of Mr. Burstow's invention, and that which makes it superior in several respects to both the bicycle and the tricycle, lies in the fact that not only can the four smaller wheels be turned at will in any desired direction, but they can, each or all, be lifted—while the machine is in action—quite clear of the ground; the apparatus at that moment is instantly converted into a single wheel apparatus, carrying, it is true, for the time the extra weight of three idle wheels, but having in compensation but half the friction of a bicycle, and possessing in the four suspended wheels, which can be dropped at any instant, a reserve or element of stability which makes the apparatus exceptionally safe at the highest speeds.

In practice the apparatus is adjusted so that the principal weight is borne by the large center wheel, and the four side wheels are but barely grazing the ground; when in this condition the machine can at any moment be made to run on the four little wheels, or on the center wheel, or upon different combinations of the center and side wheels.

From the above description it will be observed that Mr. Burstow's apparatus is singularly unaffected by roughnesses of, or small obstructions on the road; for the effect of an obstruction on the center wheel is to momentarily lift that wheel, and the machine runs past the obstruction on its side wheels, which then carry the weight; and similarly, if the side wheels run against an obstruction they become lifted thereby from the ground, and the center wheel receiving

the weight carries the apparatus past the impediment. The rider has an obvious advantage in sitting directly over the center of the driving wheel; he is thereby not only in the best possible position for propulsion, but his center of gravity being over the center of base he is in the position of maximum stability.

The Burstow center-cycle has been employed by the post-masters of Horsham and Saxmundham with great success, having been used by the letter carriers and telegraph messengers for twelve months in those districts without a single accident being recorded, and it has been employed by local bakers, with equal success, for delivering bread, and thereby saving the expense of a horse and cart.

Cigar Making at Seville.

A letter from Seville describes the government cigar factory of Spain. The factory is 700 feet long, and almost as wide, and very dirty. At the time it was visited by the writer, there were 250 young girls in the vestibule, making cigarettes; in the next room were 100 other girls engaged in the same occupation, and on the next floor 3,000 women as close as sardines in a box, in a single room, making cigars, some of them having their babies with them not a month old, while dogs were lying on the tobacco stems. The women were divided into sevens at each table, three on each side of the mistress at the top. Around each table were shelves against stone pillars, on which lay children's shoes, socks, and clothes. The air was stifling, and the buzz of conversation was now and again broken by the wailing of the babies. The flooring was so dilapidated that it was possible for an incautious visitor to fall through. Two other side apartments 100 feet long were packed with laborers. The factory consumes 10,000 pounds of tobacco per day and employs 5,000 persons, who receive 50 cents per day for 12 hours' work. The matron at each table gets her pay from the women she commands.

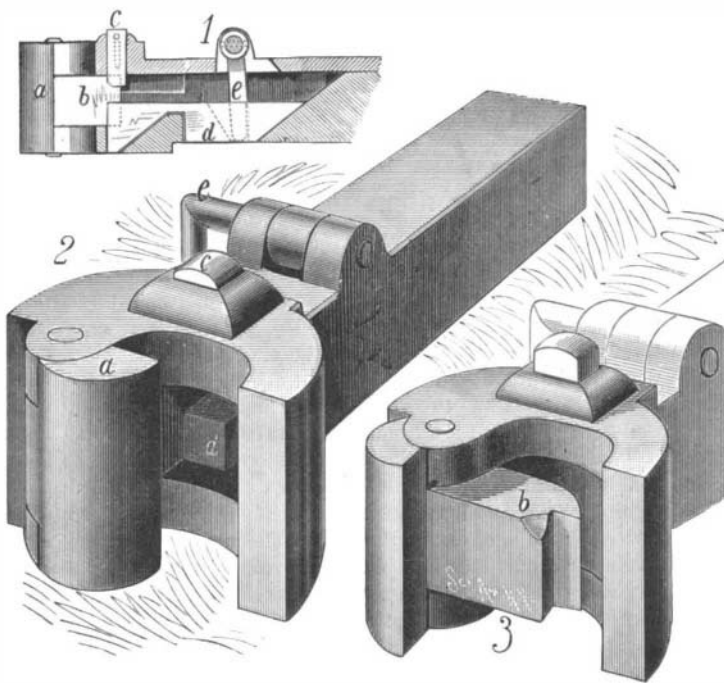
IMPROVED CAR COUPLING.

The accompanying engraving shows an invention recently patented by Mr. W. H. Thurmond, of Forsyth, Georgia. The draw bar has a longitudinal vertical recess provided with backwardly inclined surfaces, the forward one of which forms a shoulder, as indicated in the sectional drawing, Fig. 1.

On the upper part of the bar are formed two ears, which are perforated transversely to receive a rock shaft that is worked by an arm at the side of the bar. Secured to the rock shaft between the ears is an arm, *e*, Fig. 1, extending down through a slot in the longitudinally movable thrust bar, *d*, fitted into the recess in the base portion of the draw bar.

Pivoted to one ear of the bar is a coupling hook, whose form is clearly shown at *a b* in the cuts. Through an aperture in the upper part of the bar is a latch, *c*, having a movement in a vertical line.

When the thrust bar is moved back by means of the rock shaft, *e*, the latch, *c*, is raised, and drops in front of it and prevents its forward motion. The coupling hook can then be moved to the position shown in Fig. 3, the bevel at *b* enabling it to lift the latch. While the latch is raised the thrust bar drops forward to the position shown in Fig. 1. In the act of coupling the hook is turned upon its pivots, the circular rear portion raising the latch and pushing the thrust bar back and up. When it has assumed the position



THURMOND'S IMPROVED CAR COUPLING.

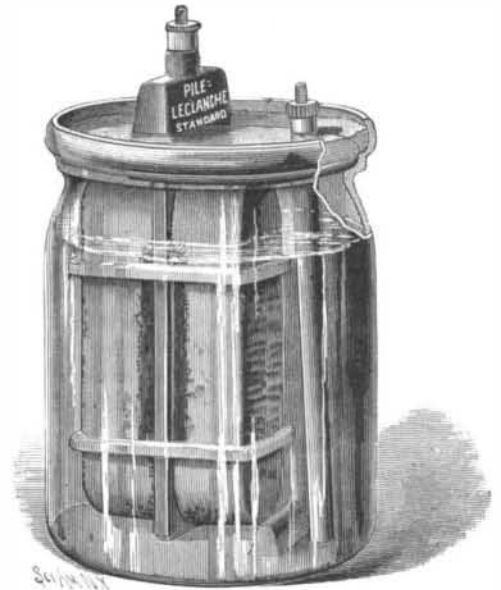
shown in Fig. 2 the rear part has passed the thrust bar, allowing it to drop forward, where it prevents the return of the hook.

All the working parts of the coupler are protected, since the bumping is upon the outside of the draw head. The cars cannot be uncoupled until the thrust bar has been moved back sufficiently to allow the hook to turn.

A SPOONFUL of kerosene oil put into cold starch will prevent the iron from sticking.

IMPROVEMENT IN THE LECLANCHE BATTERY.

The Leclanche Battery Co., of No. 149 West 18th Street, New York, have introduced a new form of jar and cover for the well known prism battery, an illustration of which we give herewith. The cover rests upon a shoulder inside of the jar, which is oval in shape, the rim of the jar above the cover being concave in shape. The cover when in place closes the jar sufficiently tight for ordinary purposes; but, if desired, it may be hermetically sealed by pouring on the



PRISM BATTERY, COMPLETE.

cover melted wax, which will spread over the cover, run into the concavity of the rim, and be held firmly in place, thereby effectually sealing the jar. Any kind of wax may be used for the purpose, but paraffin is preferable on account of the ease with which it can be removed. The cell can be unsealed with an ordinary pocket knife whenever necessary to renew or clean it. The latter process, however, will scarcely be necessary, as the paraffin prevents the salts from climbing up and fouling the cover. A cell thus sealed can be transported on boats, cars, and other vehicles without danger of slopping over the liquid. The adoption of the new jar and cover is a manifest improvement, and will undoubtedly add to the reputation of this famous battery. The jar and cover have both been patented.

Successful Artifice in Discovering a Secret.

Mr. F. J. R. Carulla, F.C.S., general manager of the Landore Siemens Steel Works, recently delivered a lecture on "The Steel Age," in which he referred to the experiments of Huntsman, the Doncaster clock maker, who perfected the process of melting blister steel in crucibles, and producing a homogeneous ingot, about 1740. Huntsman endeavored to keep his process secret, with the following result: "One cold winter's night, while the snow was falling in heavy flakes, and the manufactory threw its red glare of light over the neighborhood, a person of the most abject appearance presented himself at the entrance, praying for permission to share the warmth and shelter which it afforded. The humane workmen found the appeal irresistible, and the apparent beggar was permitted to take up his quarters in a warm corner of the building. A careful scrutiny would have discovered little real sleep in the drowsiness which seemed to overtake the stranger, for he eagerly watched every movement of the workmen while they went through the operations of the newly discovered process. He observed first of all that bars of blistered steel were broken into small pieces two or three inches in length, and placed in crucibles of fire clay. When nearly full, a little green glass broken into fragments was spread over the top, and the whole covered over with a closely fitting cover. After a lapse of from three to four hours, during which the crucibles were examined from time to time to see that the metal was thoroughly melted and incorporated, the workmen proceeded to lift up the crucible from its place on the furnace by means of tongs, and its molten contents, blazing and sparkling, were poured into a mould of cast iron previously prepared; here it was suffered to cool, while the crucibles were again filled and the process repeated. When cool the mould was unscrewed and a bar of cast steel presented itself, which only required the aid of the hammerman to form a finished bar of cast steel. How the unauthorized spectator of these operations effected his escape without detection tradition does not say, but it tells us that before many months had passed the Huntsman manufactory was not the only one where cast steel was produced."

A Dairy Exhibition at Munich.

The American Government has received an invitation to participate in an exhibition of dairy products at Munich, in October, 1884, under the management of the general committee of the Agricultural Union of Bavaria, in connection with the Bremen Dairyman's Union.