

**A NEW TELEPHONE.**

Mr. George B. Havens, of Lafayette, Ind., has invented a very simple form of telephone, which we illustrate in the annexed engraving. The instrument may be said to take the place of a telegraph key, being operated by the voice instead of the hand, and instead of a message being sent as in telegraph instruments, music is transmitted. It may be applied on any ordinary telegraph line.

The instrument may be said to consist of a metallic cylinder, resembling in size a quart pail, turned on its side, and attached to a block of wood.

By a reference to the engraving, A is the block or base in which the working portions of the instrument are placed. B is the metal sounding box, and may be made of brass, about the size of a quart measure, open at the end, C, and closed at the other end, which serves as a vibrator. In front of E is a metal standard, D, with a platinum-tipped regulating screw, which is in slight contact with the vibrator, E. The main wires, F, G, connect E and D.

The instrument is connected in the main telegraph line, the same as an ordinary relay, and tunes are hummed in the open end of the box, B, and heard from the armature of all the relays in the circuit. In this manner tunes have been sent, so Mr. Havens informs us, for over one hundred miles. In speaking of the instrument Mr. Havens says: "Only the armature of the relays in circuit vibrate. These vibrations are so rapid that the lever has no time to fly back and forth. Often, by holding the relay lever down, the vibrations are much louder, and to find out if the music goes we use the regular key and telegraph instrument. I have also been able to telegraph the Morse alphabet with my voice, by making a long sound for a dash and a short one for a dot. We sometimes throw the relay magnets closer to the armature to make the sound louder."

**IMPROVED DONKEY PUMP.**

We illustrate a donkey feed pump, from *The Engineer*, which is now being introduced in England. The engravings explain themselves. Fig. 1 is a perspective view, and Fig. 2 a sectional view. There is practically no novelty in the design that requires description, but nevertheless the pump deserves examination.

It has been especially designed for the use of owners of steam launches. It is made entirely of gun metal, and is so light that one quite competent to supply a powerful steam launch boiler can be carried under the arm. It requires little or no fitting on board as it can be bolted down at once and the connections made, and especial pains have been taken to make every portion simple, accessible, and not likely to get out of order. In these respects the little pump is meritorious, and we commend it to the attention of our readers.

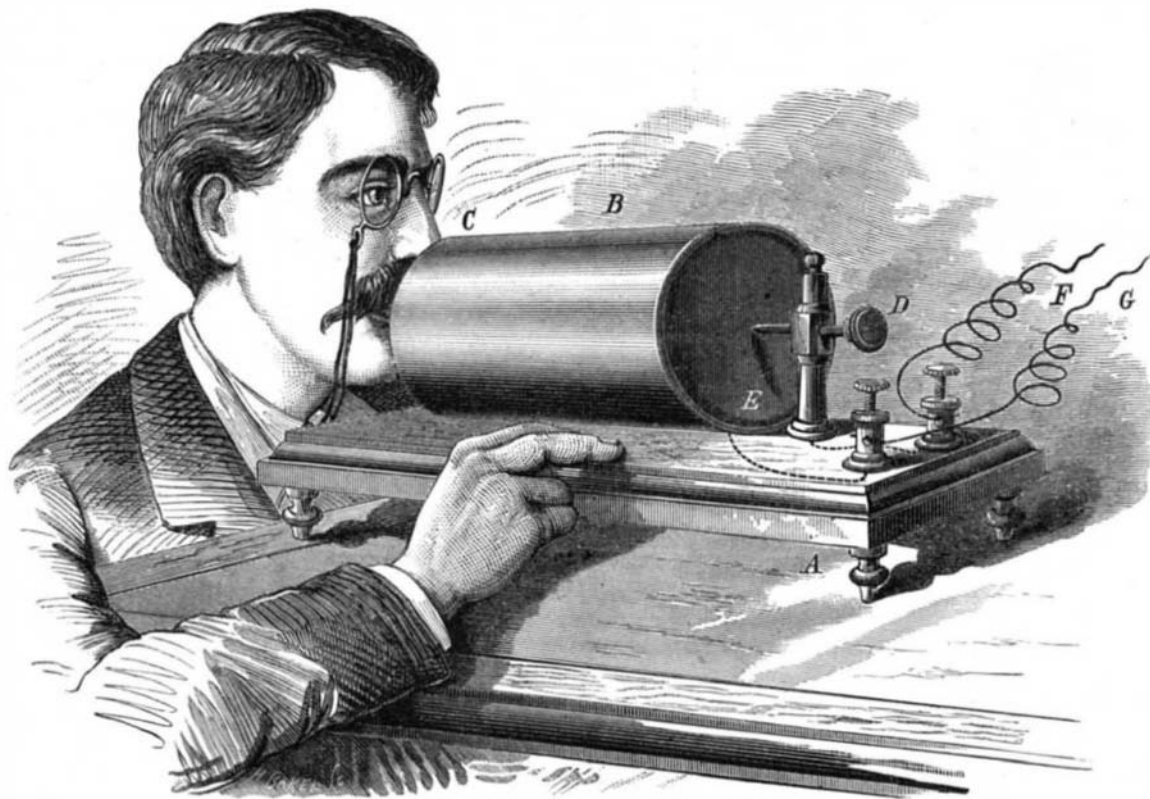
**Saw Dust Soap.**

A manufacturer in Tilsit, instead of adding infusorial earth or ground quartz to the soap mass and thus producing a sapolio, introduces a considerable quantity of very fine sawdust, previously ground and sifted. The wood fiber acts mechanically as a detergent, and besides cleaning rapidly and thoroughly, occasions a saving of one third in the consumption of soap. The soap does not contain an excess of soda, and has no ill effect on the hands. An analysis of a specimen eight days old yielded, grease, 44 per cent; soda, 6 per cent; wood, glycerin, coloring matter, 10 per cent; water, 40 per cent. The price at the factory is about 5 cents a pound,

**Progress of American Mechanical Industry.**

Details accumulate on all hands in illustration of the fact that the Americans are endeavoring, with characteristic energy, to find world-wide outlets for the products of their mechanical industry. They are not satisfied with having driven our iron and machinery out of their markets by means of a prohibitory tariff, but they are also endeavoring to reduce the demand for our steam engines, our locomotives, and our general machinery in the leading markets of the world. This was to be anticipated as an inevitable result of

gravest attention on the part of both the capitalists and the workmen of the Old World. We have always fancied that Belgian competition was a bugbear rather than otherwise. It is true that iron has been produced at marvelously cheap rates upon the Belgian markets, and that some of it has found its way into this country, and has displaced a corresponding amount of English iron. But the competition of Belgian mechanical and metallurgical industry in this important particular—it is comparatively limited in extent, and consequently it does not do us the mischief which some writers have supposed. The case seems wholly different with the American competition with which we are now threatened. The productive powers of the Americans, to whatever branch of human effort they may devote themselves, appear to be only limited by the demand which may spring up for their products. Their supplies of ironstone are practically boundless; their supplies of coal are practically boundless; their supplies of labor are practically boundless. They greatly excel the Belgians in the extent and importance of the mercantile marine, by means of which they are enabled to scatter their manufactures all over the world. They also share with us, apparently, the faculty of developing a world-wide commerce. Under these circumstances, we fancy that it is high time that both capitalists and our workers should be sufficiently impressed with the fact that in dealing with American competitors they have to confront competitors of first-rate ability, energy, and re-



**HAVENS' NEW TELEPHONE.**

the great progress which American coal mining has made during the last seven years. Iron and steel of American manufacture have now become so cheap, and are produced upon so large a scale, that they must be worked up somehow; and if the articles into which they are converted cannot find a sale upon American markets, they must be disposed of upon the general markets of the world. This is the conclusion at which Jonathan has arrived, and it is only a natural consequence of the recent course taken by the industrial history of the United States. The circumstances to which we have been advertising appear to us to demand the

sources.—*London (England) Colliery Guardian.*

**Motion and Heat.**

M. Ollivier (in the *Journal des Débats*) gives the following experiment in illustration of the conversion of motion into heat: One end of a square bar of steel, in this instance 15 mm. x 70 or 80 cen., is held by one hand in the middle and pressed strongly against a rapidly revolving emery wheel, by which means the extremity so applied becomes considerably heated. The hand at the middle of the bar does not feel any change of temperature, but that at the other extremity is soon obliged to let go, the temperature rising to the point of burning the skin. M. Ollivier thus explains this effect, which appears paradoxical at the first glance. The heat that burns the hand is not generated at the other extremity of the bar and transmitted from thence, but is produced directly at the place. Movement and heat being synonymous, the movement destroyed by the hand at the outward extremity of the bar by the stoppage of the vibrations is converted into heat, while, there being an interval of repose at the middle of the bar, no heat is perceived. A curious feature of the experiment is that at the outer extremity the thermometer does not show any exceptional temperature, because the thermometer does not stop the vibration. To produce the burning effect, the hand should grasp the end of the bar with force enough to arrest the movement.

Fig. 1.

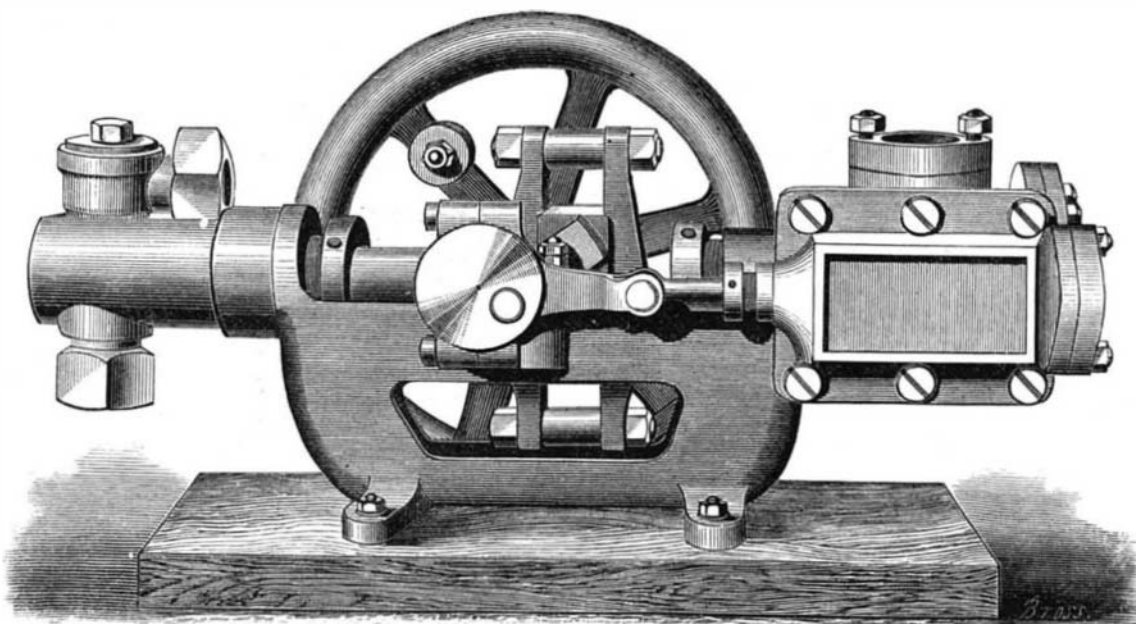
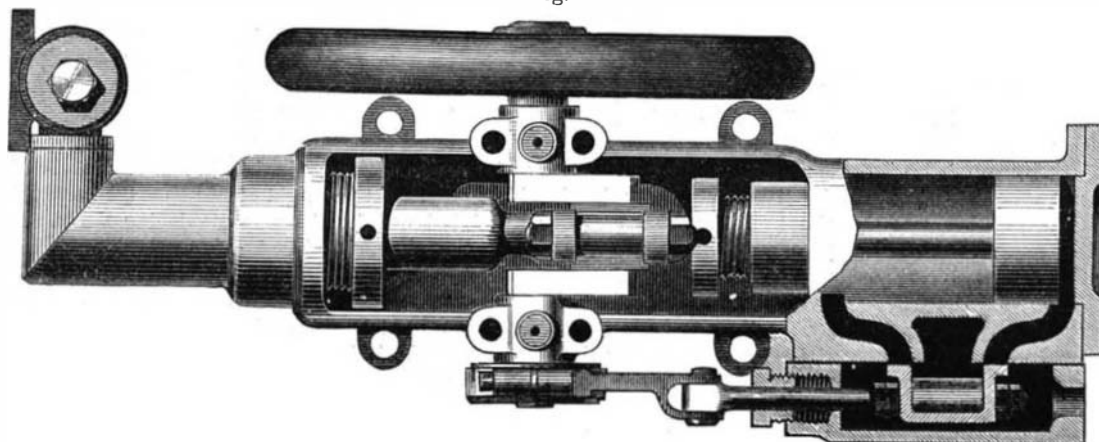


Fig. 2.



**LEUPOLD'S IMPROVED DONKEY PUMP.**

**The Potato Bug in Germany.**

The *Cologne Gazette* says that from careful observations and inquiries made since the burning of a potato field in the neighborhood of Cologne it is evident that the object of that destructive process has been completely attained. There is no further trace visible either of Colorado beetles or of larvæ, neither above the soil nor below the surface. There is reason to believe that not one beetle has escaped.

**TO MAKE STICKING PAPER.**—Brush over your sheets a solution of dextrin, with sugar mixed.