

A SPEAKING TUBE AND EARIPHONE.

The accompanying illustrations represent the practical working of an extremely simple improvement in speaking tubes, the mouth piece being provided with an attached ear piece, whereby messages may be more conveniently received and transmitted. This improvement has been patented by Mr. Frederick Schluchtner, of No. 2661 Atlantic Avenue, Brooklyn, N. Y.

One of the pictures shows the improvement in use in the hallway or vestibule of a house, another representing its employment in a factory, where the different floors are thus held in communication with the office. The mouth piece may be of the usual form, but the tube in front of the whistle has an opening at one side, surrounded by a tube leading into an attached flexible tube, at the end of which is an ear cup. The branch tube leading from the side opening, in front of the

not being diverted into the branch tube. In like manner, in speaking into the tube, the voice is projected forward in the usual way; but one can likewise hear the return message without change of position, the voice in this case being diverted into the branch tube, and thence through the flexible tube to the ear cup, so that a conversation may be carried on without constantly changing the end of the tube from the mouth to the ear, and vice versa. A fork supports the ear cup when the mouth piece is not in use.

DETAILS OF SPEAKING TUBE.

England, France, Belgium, Germany, Austria, Italy, Switzerland, and Spain.

SURFACE CONDENSING TRIPLE EXPANSION MILL ENGINES.

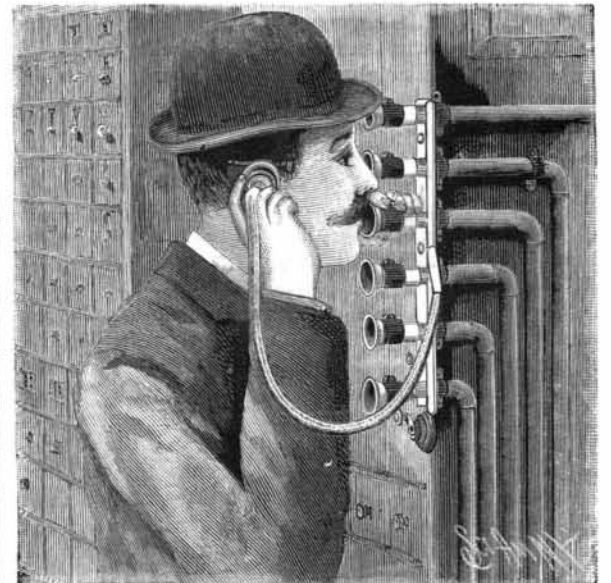
The engines which we illustrate have recently been constructed by Messrs. Hick, Hargreaves & Co., Soho Ironworks, Bolton, for a cotton mill belonging to the Kampenhofs Aktiebolag, Uddevalla, Sweden, to take the place of a pair of Woolf beam engines supplied by the same makers about thirty-five years ago. We are indebted to *Industries* for our engraving and the following particulars: The new engines are horizontal, and of the four-cylinder double-tandem type, the high and one low pressure cylinder working on one crank, and the intermediate and the other low pressure cylinder on the other crank. The high pressure cylinder is fitted with the makers' well known Inglis & Spencer's Corliss gear, the intermediate pressure cylinder with a piston valve, and the two low pressure cylinders with plain slide valves. All the cylinders are jacketed with steam at boiler pressure, and are lagged with composition and felt, cased with planished steel. The steam on its way from the high pressure to the intermediate pressure cylinder, and from the latter

to the low pressure cylinders, passes through two receivers, also jacketed with steam at boiler pressure. There are thus six jackets to be drained—viz., four cylinders and two receivers—and the makers, believing that the efficiency of jackets is largely dependent on the thoroughness with which they are kept clear of water and air, have devoted considerable attention to this problem. In the present engines the jackets are drained in series, the combined drain water from all passing into a receiver, which, standing on the engine room floor, and being provided with pressure and water gauges, gives the attendant a much better chance of keeping the jackets efficiently drained than where each jacket has its own trap placed out of sight under the floor, and too often out of mind. The engine is provided with very complete lubricating appliances, including oil pumps for the crank shaft bearings, and with indicating gear for all the cylinders. The power of the engine is transmitted by a steel spur wheel bolted to the fly wheel, but which was not in position at the time the photograph was taken from which our



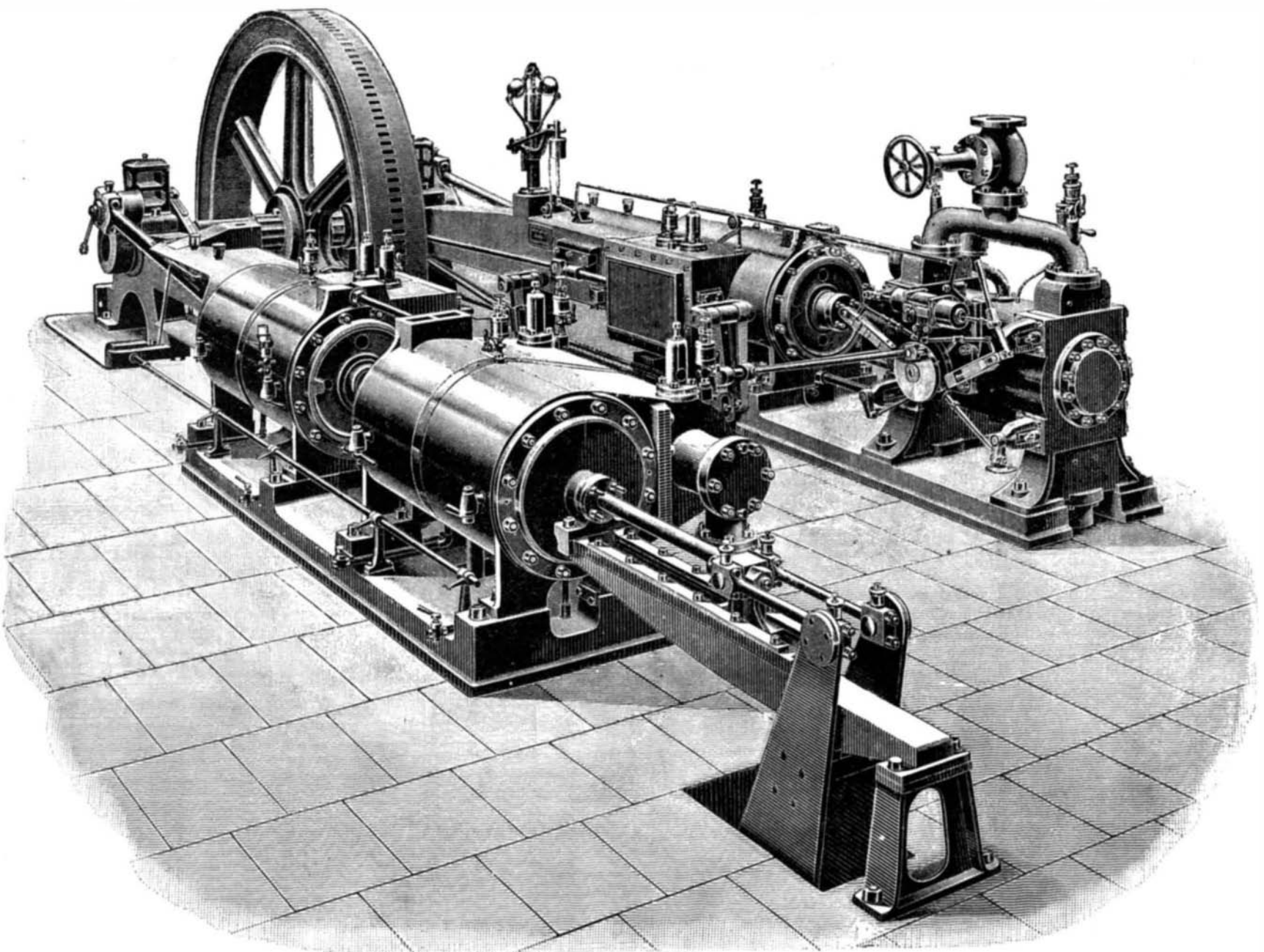
SCHLUCHTNER'S SPEAKING TUBE—USE IN A VESTIBULE.]

mouth piece, leads backward at a slight angle from the main tube, and the branch tube is also made tapering, the flexible tube being secured to its smaller end. When a person blows into the speaking tube, the air exerts its full force upon the whistle in the usual way,



SCHLUCHTNER'S SPEAKING TUBE—USE IN A MANUFACTORY.

engraving is made. The surface condenser is of the marine type, the water making two passes through Muntz metal tubes fitted in Muntz metal tube plates, and packed with "Hall" joints. To the condenser are attached the air, circulating, feed, and jacket drain



TRIPLE EXPANSION SURFACE CONDENSING MILL ENGINES.

pumps, all four being worked by levers of the piston rod of the intermediate pressure cylinder.

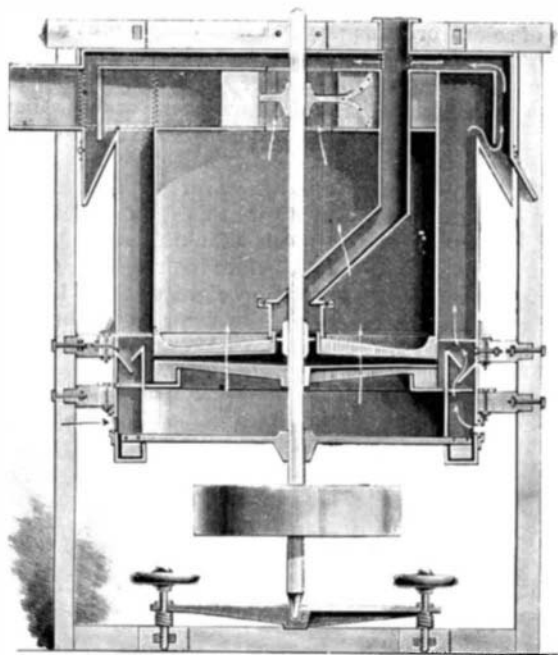
The boilers for supplying steam—which are two in number, of the Lancashire type, with a 120 pipe economizer—were supplied by the makers of the engine. The following are the principal particulars of the plant:

Engines.	
High-pressure cylinder.....	13 in.
Intermediate-pressure cylinder.....	20 in.
Low-pressure cylinders (two).....	21 in.
Stroke.....	36 in.
Steam pressure.....	160 lb.
Indicated horse power.....	325
Air pump, single acting.....	12 in.
Circulating pump, single acting.....	10 in.
Cooling surface in condenser.....	640 sq. ft.
Boilers (two).	
Length of shell.....	28 ft.
Diameter of shell.....	7 ft. 6 in.
Diameter of flues.....	3 ft.
Test pressure.....	250 lb.

Messrs. Hick, Hargreaves & Co. are well known makers of large high class engines, such as are required for cotton mills for which large power, steady driving and economy are demanded, and have in one year, we are informed, turned out about 25,000 i. h. p. of such engines, with the corresponding boilers and mill gearing.

A GRAIN SCOURER, POLISHER, AND SEPARATOR.

The illustration represents a machine having an upper fixed and a lower revolvable screen between which the grain is fed centrally and passed out peripherally, a suction fan forcing a current of air through the screens, whereby the grain is thoroughly scoured and polished, the screenings and other impurities being at the same time separated from the grain. By means of an inlet chute the grain is passed through a central feed opening in the middle of the upper screen, there being a feed screw arranged upon the vertical shaft in the feed opening to press the grain coming down the chute into and between the two screens. The lower end of the vertical shaft on which the lower screen is mounted is set in a step supported at its ends on springs, whereby the scouring disks will be self-adjustable when the stream of wheat is not regular, hand wheels being provided to enable the miller to adjust the machine while in motion to scour hard or light. The grain is discharged from the peripheries of the screens into an annular receptacle into which extend wings on the under side of the rim of the lower screen, whereby the grain is forced upward on the outer wall of the receptacle, finally passing over the edge upon an inclined flange extending into an annular casing supported on the main frame. The grain is thence discharged upon another inclined flange, and falls through into a discharge channel in which operate wings secured on a spider rotated by the central shaft, the channel having an outlet chute through which the scoured and cleaned grain is discharged. A suitable suction fan with fan wheel is secured on the vertical shaft centrally in the top of the casing, and the air current through the separating chamber, as shown by the arrows, is regulated by a ring with slotted holes working over similar holes in



RUSSELL'S GRAIN SCOURER AND SEPARATOR.

the outer casing, all the air holes being closed and opened at the same time alike all around the machine. The arrangement is such that the grain is subjected to two distinct currents of air, the first passing through the grain while it is being acted on by the screens and the second current passing up through the annular separating chamber. This machine has been in prac-

tical use a sufficient time to demonstrate that it runs with comparatively small power to do excellent work, and it is not expensive to build. The invention forms the subject of a patent issued to Mr. George E. Russell, deceased, and further information relative thereto

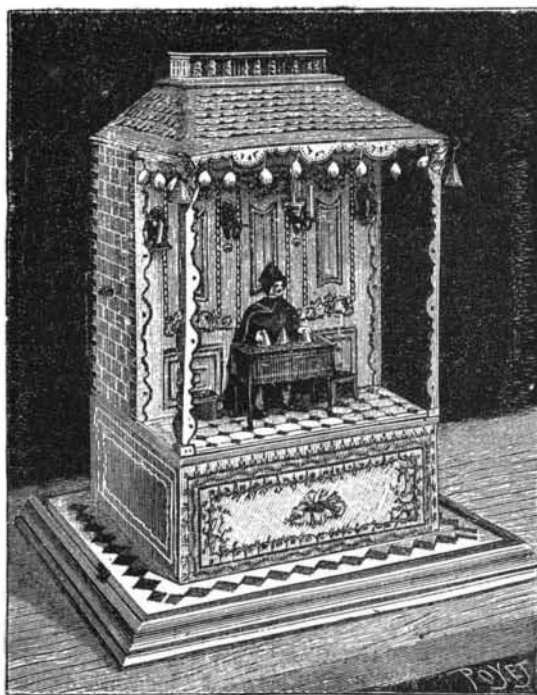


Fig. 1.—AUTOMATON REPRESENTING A JUGGLER PLAYING WITH BALLS.

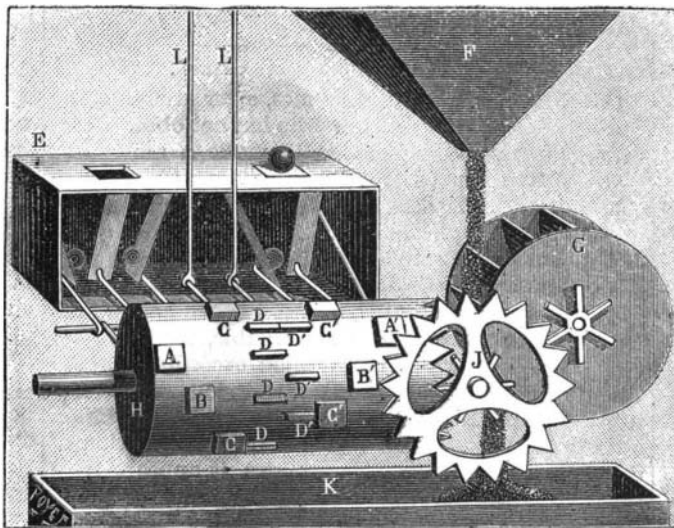


Fig. 2.—INTERNAL MECHANISM OF AUTOMATON.

may be had of the administrator, Mr. Charles S. Russell, care of Hardesty Bros., Columbus, Ohio.

A CURIOUS AUTOMATON.

The automaton figured herewith has the peculiarity of being actuated by a simple flow of sand, and what renders it still more curious is that the epoch of its manufacture dates back to the first half of the 18th century. This unique piece belongs to Mr. Gaston Tissandier, and we have been enabled to study it in detail upon taking it apart in order to repair it.

The image, clad in an oriental costume of bright colors and seated behind a little table, presents its back to a brick and stone structure of the style of Louis XV., painted white in front, and ornamented with blue and gold fillets. The structure is capped with a slate roof, which is itself crowned with a sort of belvedere. All this is of cardboard, and each accessory object, such as the stools to the right and left of the automaton, the sconces with their candles, and the small lamp suspended in the center, is a masterpiece of patience and exactitude (Fig. 1).

When the automaton is in motion it acts as a juggler. The arms rise alternately or in unison and lift the cups, and, at every motion, expose upon the table, first, to the right, a white ball, which disappears and passes to the left, and then, to the left, a red ball, which passes to the right and disappears. Then two white balls make their appearance upon a new motion of the cups, and these are changed into red ones at the next motion.

These results are obtained as follows: Let us begin by removing the little belvedere that crowns the whole, and then fill the receptacle that we observe in the edifice with fine sand. This done, let us allow the sand to fall by drawing out a small strip of metal which closes the aperture at the bottom of the hopper, F (Fig. 2). The sand flows in a continuous stream and causes the wheel, G, to revolve with great rapidity. To this wheel are fixed six tappets which engage with a toothed wheel, J, which thus diminishes the rapidity. This wheel itself, provided at the back with tappets, communicates through the latter a slow and continuous motion to the cylinder, H, which causes the automaton

to act as follows: Opposite the cylinder there are two series of levers of four each, the extremities of which we suppose to be marked A, B, C, D and A', B', C', D'. The two levers, D and D', lift the arms, L, L, and the extremity of each of the six others is placed under a small strip of cardboard. Each of these strips is hinged by one of its extremities to the table, the other end, on rising, places itself just beneath the small aperture in the table, E. If now we examine the cylinder, B, we shall see that it is provided with a series of cams, A, B, C and A', B', C', and opposite these, other and smaller ones, D and D'. Each cam, when the cylinder revolves, strikes in turn one of the levers. The larger cams lift the levers and consequently the hinged cards, with the balls of different colors, and keep them lifted for some time, and during this period the smaller cams act upon the levers of the arms that hold the cups. In this way, the balls are in place when the arms rise, and do not disappear, in order to be replaced by others, until the arms have descended. The cams, A and A', cause the red balls to act, and the white balls are raised by the cams, C and C'. As for the cams, B and B', they act upon strips of cardboard that merely support obturators for the apertures in the table.

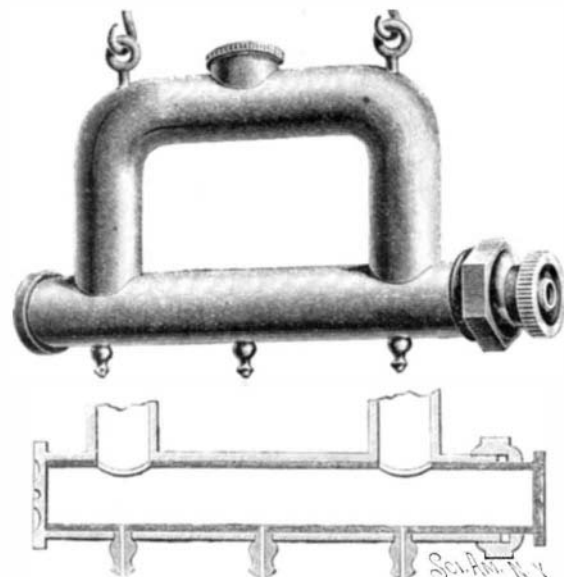
Such is the ingenious mechanism of this little work of art, which it would not be impossible to construct from the above data. We again state that all the parts of the mechanism are of cardboard, and, further, that the levers are formed of the very thin wire used in the manufacture of artificial flowers.—*La Nature*.

Help for the Russians.

The American steamer *Indiana* lately sailed from Philadelphia with about 4,000 tons of grain and flour, the generous gift of the citizens of that noble town to the suffering people in Russia. The railroads transported the cargo free, and all who dealt with it, from truckmen and stevedores down to insurance companies, rendered free service. This ship was soon followed by the steamer *Missouri*, from New York, carrying about 3,000 tons more of meal and flour to the famine-stricken Russians, the generous contributions of Western millers and farmers. The use of the steamer was also given free of charge, by the Atlantic Transport Line. The total contributions to the Russians, so far, reach the sum of about half a million dollars.

AN IMPROVED LUBRICATOR.

The accompanying illustration represents an improved device designed to deliver oil upon moving mechanism, and especially adapted to be suspended above moving belts to keep them well oiled. It has been patented by Messrs. Albert A. Taylor and William C. Edwards, of Cornwall, N. Y. The lower cylindrical reservoir has drip tubes on its under side, and connected with its opposite side is a yoke-like upper reservoir having at the top an inlet opening provided with a removable screw cap, there being eyes near the ends of the upper reservoir to enable the device to be conveniently suspended in any desired position. Within the lower reservoir is a cylindrical valve which extends the entire length of the reservoir and projects from its open end, fitting closely in the packing nut, and its outer end terminating in a head with a milled edge. The valve has openings registering with the ends of the yoke-like reservoir, and it also has perforations registering with the bores of the



TAYLOR & EDWARDS' LUBRICATOR.

drip tubes, the slight turning of the valve preventing any oil from passing through the tubes, while it may be so turned as to cut off entirely the supply from the yoke-like reservoir. The valve is preferably adjusted by turning it, but it may be made to slide endwise with the same effect, being readily adjustable to nicely regulate the flow of oil.