

AGRICULTURAL INVENTIONS.

In distributing attachments for plows for sowing seeds or fertilizers in the furrow formed by the plow, and in which a stationary hopper, a movable lower spout, and a subjacent shaking wheel have been arranged in rear of the plow standard, it has been a serious objection that said attachments were not adapted to distribute with the same regularity when traveling over hilly and horizontal surfaces. This objection has been removed in the improvement patented by Mr. Timothy C. Norwood, of Honca Path, S. C. In this improvement the hopper, the spout, and the agitating wheel are all connected by two and the same side bars, which, in their turn, are connected by links to the plow standard, whereby the hopper, spout, and wheel move together in parallel position behind the plow standard, and consequently maintain the same and proper relation to each other, under all varying conditions of the surface of the ground.

An improvement in seed planters has been patented by Mr. Charles P. Hanson, of Edwardsburg, Mich. The object of this invention is to provide an improved means of raising the openers of a planter from the ground and adjusting them to work at any desired depth. For these purposes the tongue of the planter is pivoted at its rear end so as to project above the main frame, and a slide bar extending back of the tongue is adapted to be thrown in contact with said end of the tongue by an adjusting lever operated by hand and provided with attachments for holding it in any desired position. By these means the tongue and frame may be set at any required angle of inclination with each other, and the openers, which are attached to the frame, be rapidly and easily adjusted or elevated.

An improvement in devices for separating grain from cockle and other small seeds, and for separating grain into grades, has been patented by Messrs. Martin B. Parker and Myron T. Smith, of Blue Earth City, Minn. In this device the grain is separated and graded during its passage down an inclined screen, and final delivery of the larger plump kernels over the lower end of the latter. As the grain passes down the screen, it is kept in contact therewith and prevented from bounding away from the screen by a series of flaps or aprons of rubber or other flexible material, arranged transversely over the screen. These aprons also serve to retard the descent of the grain, so that it may be properly separated and graded. The screen is prevented from sagging, and is kept up to the straight line of the lower edges of these aprons by longitudinal ribs attached to the frame and arranged under the screen cloth. This separator is a decided improvement upon other separators in use for like purposes.

IMPROVED LIFE RAFT.

The engraving shows an improved life raft recently patented by Mr. Thomas Hall, of Newton, Mass. It is designed to be carried on ships and steamboats, and consists of a double float or raft made of cork or other buoyant material, and of such shape that they may be fitted to the outside of the ordinary ship's boat.



TRANSVERSE SECTION OF LIFE RAFT.

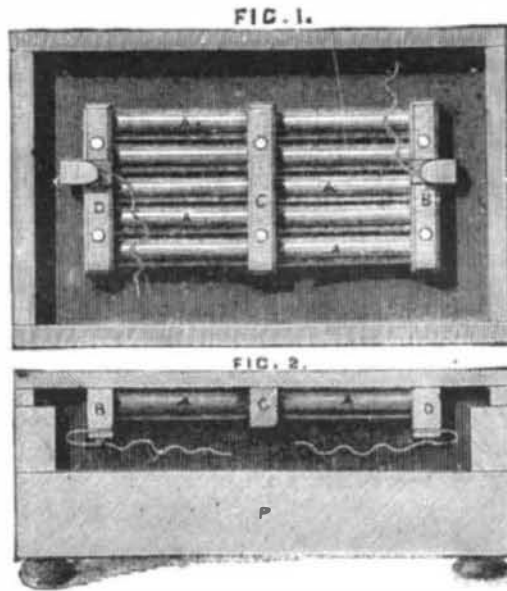
These rafts or floats are made in two parts, one being placed on each side of the boat, to which they are secured by suitable fixtures and lashings, as represented in the engraving.

When the parts of the raft are united they form a cradle or holder in which the boat rests, and the curved ends of the rafts are nearly in contact with each other at the bow and stern of the boat. While it is preferable to make the raft of such materials as can most readily be made to conform to the shape of the boat, straight cylinders or caissons may be used.

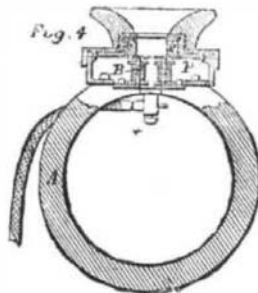
On board a ship or steamboat the raft and its included boat is carried on deck or hung from the davits in the usual manner, and when launched it takes the water without danger of upsetting. The boat may be filled with people, and the life lines will support a large number of those who are in the water, both being used simply for floating; or the lashings may be cut and the floats detached from the boat, which can then be rowed, with its passengers, to any desired point, and return to take off those who are clinging to the floats and the life lines.

THE TELEPHONE AT THE PARIS OPERA.

One of the most popular attractions at the Paris Electrical Exhibition is the nightly demonstration of the marvelous powers of the Ader telephone, by its transmission of the singing on the stage and the music in the orchestra of the Grand Opera at Paris, to a suite of four rooms reserved for the purpose in one of the galleries of the Palais de l'Industrie. This demonstration is given nightly between eight and eleven



o'clock, and the enormous number of people who crowd the entrance to the building before the doors are open to the evening visitors rapidly resolve themselves into patient queues as soon as they can obtain access to the gallery adjoining the telephone rooms. There they patiently await their time for admission, and the privilege of hearing for a few minutes whatever may be going on at the opera—solo, chorus, instrumental music, or possibly all three, until the allotted time has expired, and the listeners have to give way for a fresh installment from the outside. In this way eighty telephones are constantly at work at the same time, at short intervals the communication being shifted to another set of eighty similar instruments in two other rooms. It may be



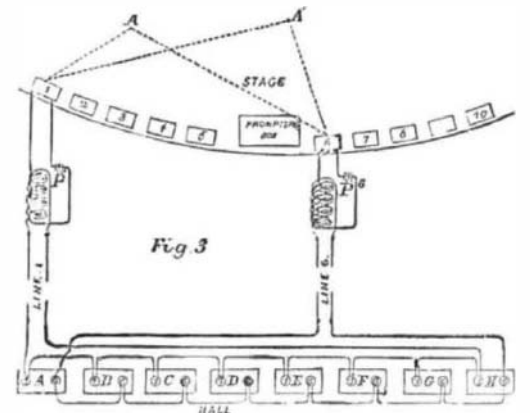
remarked in passing that this distant audience of the performance at the opera enjoy their allotted moments of actual transmission and that interludes do not count. Certainly nothing has ever been done before so effectually to popularize science, and to render the masses familiar with the effect, however ignorant they may be of the cause, of this marvelous invention, the first feeble voice of which was heard in the Centennial Exhibition of 1876. Our contemporary, *L'Electricien*, publishes this week an excellent description of the installation at the opera and in the Exhibition, and from this we gather our information and illustrations on the subject.

The transmitters are microphones on the Ader system, placed in front of the opera stage, close to the footlights and behind them. Figs. 1 and 2 are a plan and longitudinal section of one of these transmitters. Each consists of ten small carbon pencils, A A, arranged in two series of five each, and supported by three cross pieces, B C D, fixed to a small pine board, which receives the vibration and serves as a cover to the instrument. This board rests, as shown, in a massive block of lead, P, which in its turn is supported on four blocks of soft rubber. This arrangement is found to prevent any vibrations of the stage from being transmitted to the microphones, and the only movements taken up by the instrument are the sonorous vibrations of the air. The microphone is in connection with a Leclanché battery, and the

wire of a small induction coil without any condenser. The line, laid in double wire, is connected on the one hand with the induction coil, and on the other with a series of telephone receivers placed in the rooms at the Palais de l'Industrie. There are eight receivers thus coupled to each transmitter. The undulatory induction currents developed in the fine wire of the induction coil by the variation in intensity of the current traversing the induction wire, react on the receiver. There are ten such installations as we have just described on the stage of the opera, each with its own battery and induction coil, and double line to the Exhibition. As the batteries become rapidly polarized, two sets are provided for each transmitter, and the batteries are shifted every fifteen minutes by a commutator. Fig. 3 is a diagram showing the arrangement, the transmitters being numbered one to ten; the batteries are shown at P, the induction coil at B, and the receivers in connection are marked A to H. Only two complete circuits are shown to avoid confusion.

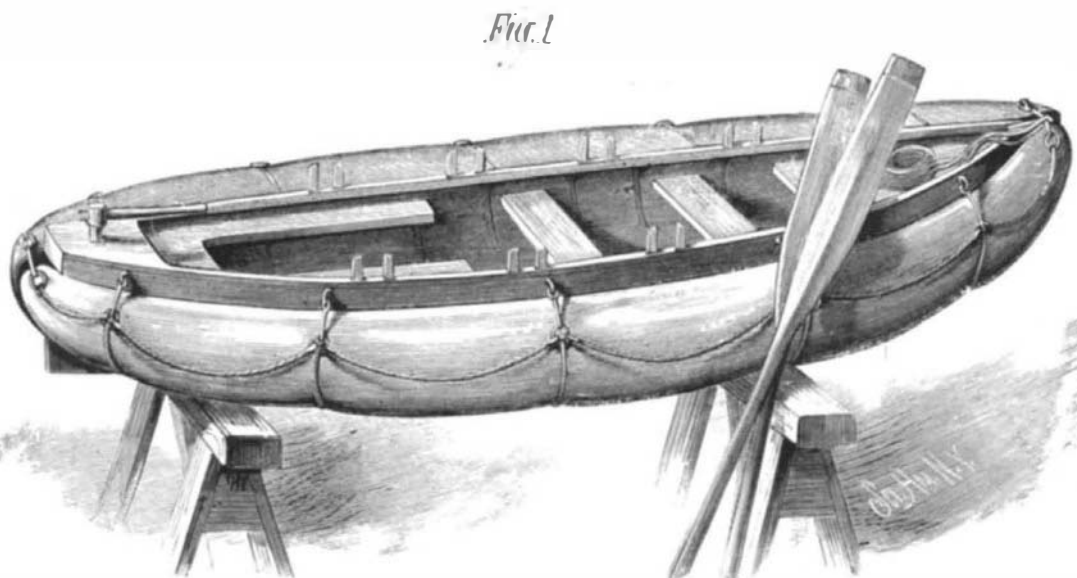
The Ader receiving telephone, shown in Fig. 4, is well known; it is a magneto-electric instrument, the magnet of which is formed into a ring so as to serve as a handle (see A, Fig. 4). The two cores, B B, are attached to the poles, and have wires coiled round them; a soft iron ring, F F, is placed over the poles, and in front of the diaphragm. The object of this ring is to serve as a supplementary exciter, and its object is to give to the lines of magnetic force a direction perpendicular instead of divergent to the diaphragm; by this arrangement the variations produced in the magnet by the induction currents of the coils have a maximum effect on the diaphragm; it is to this arrangement that the clearness of definition of the Ader telephone is due.

M. Hospitaller, in the article from which we are drawing our information, refers to a peculiar property of the Ader telephone which we cannot do better than deal with in his own words: "We will now consider the new acoustic effect which Mr. Ader has discovered, and applied for the first time in the telephonic transmission at the Electrical Exhibition. Every one who has been fortunate enough to hear the telephones at the Palais de l'Industrie has remarked that, in listening with both ears at the two telephones, the sound takes a special character of relief and localization which a single receiver cannot produce. It is a common experience that, in listening at a telephone, it is practically impossible to have even a vague idea of the distance at which the person at the other end of the line appears to be. To some listeners this distance seems to be only a few yards, to others the voice apparently proceeds out of a great depth of the earth. In this case there is nothing of the kind. As soon as the experiment commences the singers place themselves, in the mind of the listener, at a fixed distance, some to the right and others to the left. It is easy to follow their movements, and to indicate exactly, each time that they change their position, the imaginary distance at which they appear to be. This phenomenon is very curious, it approximates to the theory



of binauricular audition, and has never been applied, we believe, before to produce this remarkable illusion to which may almost be given the name of auditive perspective. Having explained this phenomenon, we may consider its cause, which is a very simple one. In order to realize it, we may recall the stereoscope, which allows us to see objects in

their natural relief. A similar effect is produced to the ear, and may be explained by referring to Fig. 3. Each person is placed in front of a transmitter with two telephones, which receive the impression from two distinct transmitters, placed a certain distance apart. These transmitters are grouped in pairs, 1 and 6, 2 and 7, 3 and 8, 4 and 9, and 5 and 10. Fig. 3 shows the complete arrangement for group 1 and 6. This group supplies sixteen telephones adapted for eight listeners, but the transmitter 1 serves the eight telephones on the left, and the transmitter 6 the eight telephones on the right of the eight listeners, A, B, C, to H. When the singer is at the point A, the transmitter 1 is more strongly influenced than the transmitter 6; the left ear is,



HALL'S LIFE RAFT.