

**AN IMPROVED POTATO DIGGER.**

A machine designed to be drawn by two horses, and to dig the potatoes in a row, irrespective of the contour of the ground, delivering them at the rear, separated from weeds and dirt, is shown in the accompanying illustration, and has been patented by Mr. Asa C. Collins, of Driftwood, Cameron County, Pa. A rearwardly extending frame which supports a cage-like structure is carried on the main axle by side arms, through blocks which ride in segmental grooves, the front ends of these side arms being fulcrumed upon bell crank levers, connected to a cross shaft. The main axle also carries a gear, readily thrown into and out of engagement, which works a shaft carried by the side arms, with a bevel gear that operates a rearwardly extending horizontal shaft, carrying two screw flanges or spiral blades, to the edges of which the cage is secured, and other internal and smaller flanges which extend outward and at right angles from the larger flanges. To the lower forward end of the cage is connected a scoop, and the lower half of the cage at the rear is covered by a semicircular curtain connected to the main frame. The tongue is hinged to the first of two cross bars of a forwardly extending frame carried by the main axle, and is provided with a bracket through which there passes a crank shaft mounted upon a forward cross bar of this frame, an operating lever being connected to the shaft, and a rack arranged in connection therewith, whereby the tongue may be raised or lowered. Bell crank levers carried by the main shaft, and connected to the shaft which operates the cage with spiral blades, are connected by rods to the bell crank levers carried by a shaft on the forward end of the frame, and a vertical lever is rigidly connected to this shaft, by the moving of which backward or forward the scoop is raised or lowered, its proper inclination being given by raising or lowering the tongue. Steel clearers are arranged to bear against the edges of the spiral blades, to cut off weeds and tops. As the blades are revolved, the loose earth is sifted through the openings in the cage, and the potatoes, being held from falling backward by the internal outwardly extending flanges, are delivered over the rear cross bar to any proper receptacle connected to the back of the machine.

**VERTICAL PLATE BENDING ROLLS.**

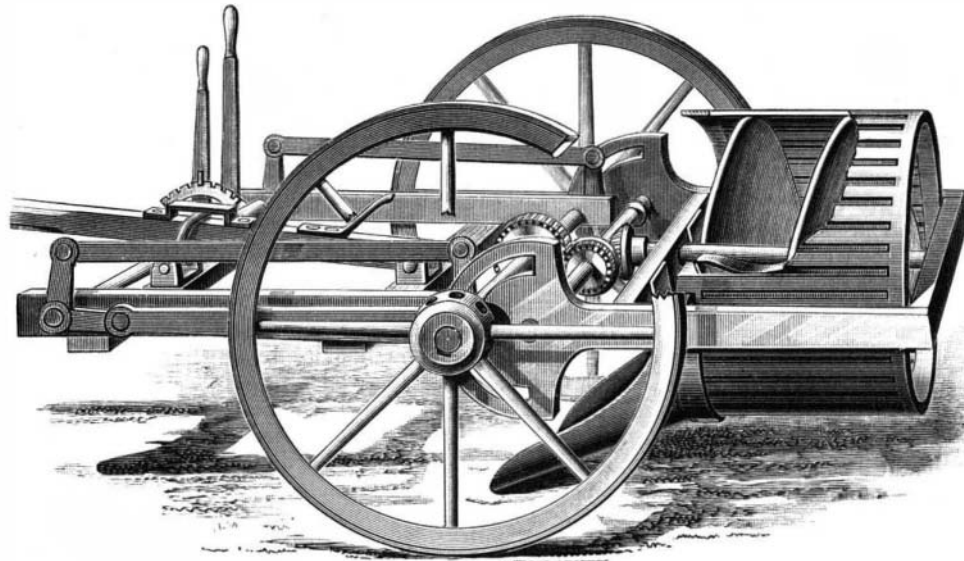
We illustrate, from *Engineering*, a set of vertical plate bending rolls manufactured by Messrs. Smith Brothers & Co., Kingston Engine Works, Glasgow. These weigh over 40 tons, and are intended for rolling steel plates cold, 11 ft. wide by  $1\frac{1}{2}$  in. thick. The three rollers are made solid of forged steel, the front one being 21 in. in diameter and the two back ones being each 16 in., these latter being well supported by friction rollers.

The machine has two different speeds of gear, to suit light and heavy plates, and the rollers are driven by a pair of vertical engines through powerful triple gear by means of a large wheel keyed on each end of the rollers. The front roller can be drawn up between the arms of the large wheel after a complete circle has been rolled.

**Action of the Telephone.**

The following is an abstract of a paper in the *Elektrotechnische Zeitschrift*: "The mechanical movement of the diaphragm of the telephone, if actuated by powerful currents, can be shown by the nodal lines formed by lycopodium dusted on its face; but if the current

the musical notes or vocalization which results from the action of the diaphragm itself. For the most accurate examination of the movement of the telephonic diaphragm the author has adopted König's method of dancing flames analyzed by a rotating mirror; and outline diagrams of the different forms of the vowel sounds as sent and received, revealed by this method, are given. The effect of the introduction of electrical resistance, capacity or self-induction in the circuit, as regards the alteration and inter-confusion of the different vowels or consonants, is thereby clearly revealed, and is due not so much to reduction of the intensity of the sound as to the rounding off of the current waves. The permanent record of these flames could not be photographically produced with ordinary gas; but a certain degree of success followed the use of bisulphide of carbon vapor burning in nitrous oxide gas, as by this means the maxima or ridges of the flames were clearly developed, though the minima or furrows were somewhat indistinct. The author proposes the application of this method for testing dynamo machines, as by it can be seen the actual progress of

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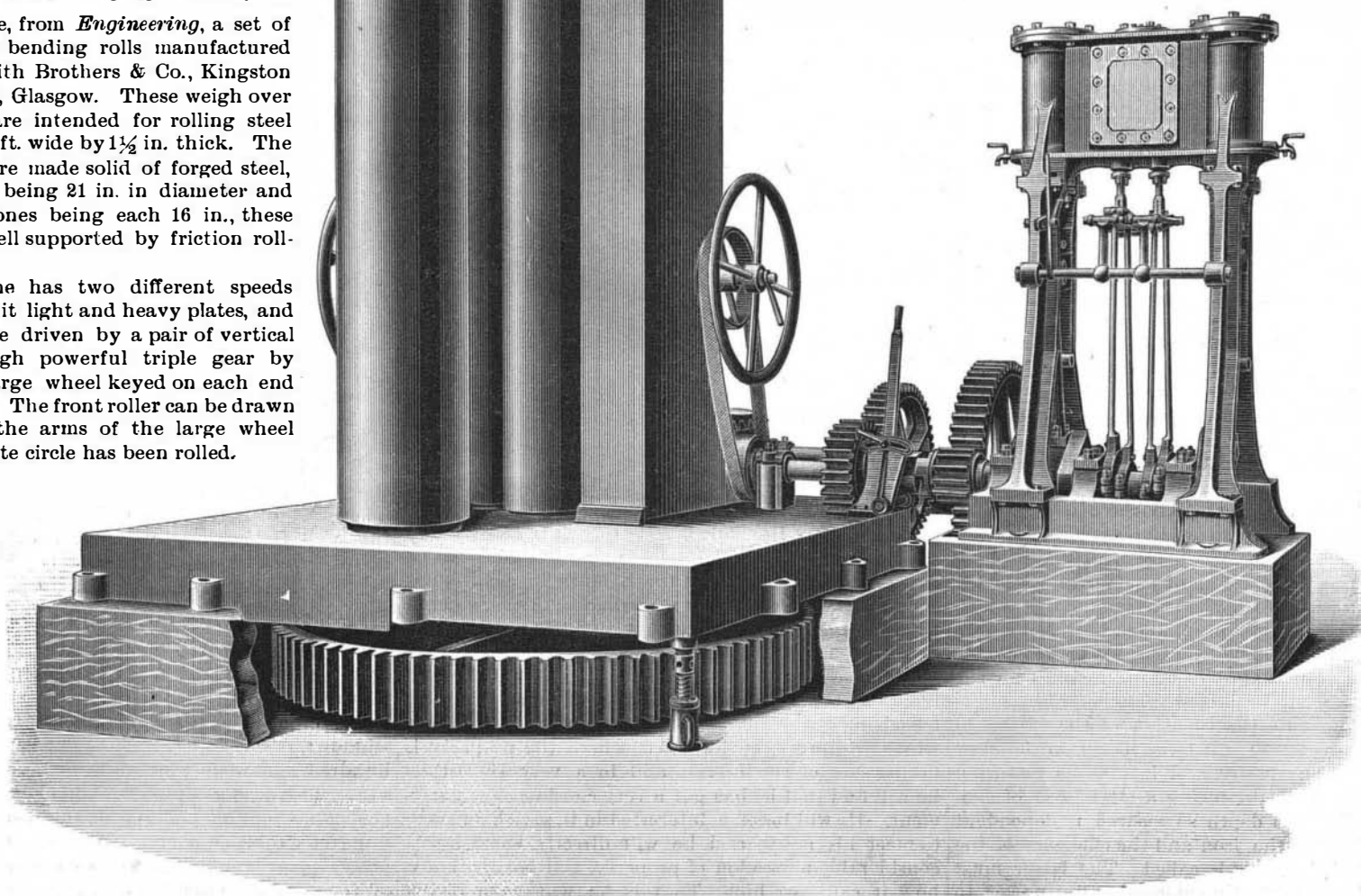
be generated by a microphone or by another telephone actuated by singing or speaking, not a trace of a Chladni's figure is produced. By affixing a small mirror, however, between the center and circumference of the diaphragm, and reflecting therefrom a beam of light on to a distant scale or telescope, its motion can be detected; but for a lecture demonstration the best method for exhibiting this motion is to fasten a stretched wire to a projection on the center of the diaphragm, and fix a mirror longitudinally on the wire between a loop and a node, by which means a movement of 18 in. or so can be given to the spot of light on the scale. The form of the vibration is, of course, not reproduced in this latter instance. If mirrors be fixed to both the actuating and receiving instruments, the beam, after reflection from both, being thrown on a screen, as in Lissajous' method, the figures observed afford a most simple means of illustrating the deformation of

the phase in the alternating current, or the impulse at the passage of the brush over each commutator plate in the continuous current. It could also be conveniently applied for chronographic measurements, e. g., the velocity of projectiles in the gun tube. Let the shot contain an iron bar, and the gun be surrounded by a series of coils which are in connection with a telephone and some source of electric current; then the time of the passage across the plane of each coil can be actually recorded on the photographic plate, the great advantage of this method lying in the fact that the gun tube need not be tampered with, and that one or two sets of coils would suffice for guns of any caliber."

**Electro-plating with Aluminum.**

Herman Reinhold, in the *Jewelers' Journal*, says: The solution of the plating bath is as follows: 50 parts of alum,  $AlK(SO_4)_3 + 12H_2O$  are dissolved in 300 parts of water, and to this 10 parts of chloride of alumina ( $Al_2Cl_6$ ) are added, heated to  $200^\circ$  and cooled, whereupon 39 parts of cyanide of potassium are added. The object to be plated has to be cleaned, and to be absolutely free from grease in any form, whereupon it is suspended in the bath over the electro-positive electrode, the plate of metallic aluminum to be suspended on the negative pole. The electric current ought to be weak.

The plating when polished will be found to be equal to the best silver plating, having the advantage of not being oxidized or getting black when brought into contact with sulphurous vapors, which would make it especially valuable for plating spoons and tableware.

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