

HYDROSTATIC APPARATUS.

The hydrostatic or hydraulic press is a machine in which the pressure of a piston, on a body of water of relatively small sectional area, is made to propagate the force to a cylinder of multiple area, where the force is directly and the speed inversely as the difference. We extract from Knight's "Mechanical Dictionary" the annexed engravings of a large variety of apparatus based on the same principles. A

HYDROSTATIC PRESS PUMP

is represented at A, in Fig. 1. *q* is the water cistern, and *r* is the pump barrel, which has a sucking tube, *t*, and a conical valve, *s*. The plunger is operated by the lever, which may be adjusted so as to give greater or less rapidity of stroke. *k* is a safety valve, and *z* the discharge valve. On lifting the plunger, water is drawn into the barrel, *r*, through the tube, *t*, and by depressing it the water is forced out through the pipe, *j*, the valve, *z*, rising to permit its passage. B, same engraving, is an

HYDRAULIC INDICATOR

or gage, used to indicate hydraulic pressure. Water, under the pressure to be tested, is admitted through the pipe, *a*, to a cylinder inclosing a piston, which tends to depress the short arm of the lever, *b*, counterbalanced by the weight, *c*. A movable weight slides on the long arm of the lever, and weights, *d*, are added to its outer end when a very great pressure is to be measured. An

HYDRAULIC PULLING JACK

is represented at C. A cylinder, *a*, contains a tube, *b*, to which the piston, *c*, is attached. *d* is a smaller tube sliding within the piston and tube, *b*. A valve, *e*, closes the communication between the cistern, *f*, which contains a pump, *f'*, operated by the hand lever, *h*, and the cylinder, *a*. Two passages, *g g*, afford communication between the tube, *d*, and cylinder, *a*, at the back of the piston, *c*. Water is poured into the cistern, and the jack is suspended, cistern end downward. Working the hand lever forces, by means of the plunger, *h*, water through the tube, *d*, and passages, *i i*, and depresses the piston to the bottom of the cylinder, *a*. The water at the back of the piston returns at the same time to the cistern through the passages, *g*. On unscrewing the stop valve, *e*, the water returns through the tube and passages, *i i*, to the cistern, relieving the piston from pressure and allowing a suspended weight to fall. D is a

BOOK PRESS.

It is arranged with either one or two pumps for forcing water into the lifting cylinder, the piston of which raises the platform on which the printed sheets are placed. This is kept in horizontal position by upright standards, and between it and the head of the press the sheets are compressed. At E and F are shown a

HYDRAULIC RAIL BENDER AND SHAFT STRAIGHTENER.

In the first of these, the action of the lever, *a*, operates a small force pump within the casing, which is connected with a larger cylinder, the piston of which forces the plunger against the rail, midway between the points where it is held by the lips, *c c*. In the shaft straightener, F, the beam, *a*, and shaft, *b*, are each inserted within the collars, *c*, and pressure is applied through the plunger, *d*, operated by a small hydraulic press, inclosed within the casing, *e*, and worked by the lever, *f*. G is an

HYDRAULIC PUNCH,

which comprises a force pump and operating cylinder, in which the piston carrying the punch, *b*, is inserted, inclosed in a case, *a*. The lever, *c*, operates the pump to depress the piston and to force the punch through a plate beneath; it is then raised by the lever, *d*, to punch another hole. H is a

JUICE PRESS,

used for the extraction of liquids from the more solid saturated portions. In this a horizontal plunger, *a*, actuated by a screw, *b*, works in a water chamber, *c d*, to raise a ram, *e*. A vertical screw, *f*, works in the head, *g*, on the standards, for raising or depressing the piston, between which and the ram, *e*, substances are compressed. I is the

HYDROSTATIC BELLOWS.

Water poured into the funnel-mouthed tube, *a*, flows into the flexible-sided box, *b*, and raises a weight many times greater than its own. The weight may be lifted in this way until its combined pressure and that of the column of water in the bellows, *b*, is equal to that of a column of water having an equal surface and

as high as the column in the tube, *c*. At J is represented a

HYDRAULIC DOCK,

by which a vessel is raised clear of the water for examination or repairs. The vessel is brought over a platform which is slung between the frames, being suspended by chains which pass over pulleys. The lower ends of the chains are

which one half of the boat is swaged at a time between dies. The engraving shows the disposition of the press clearly and needs no further description.

Who Originated Electroplating?

In our recent obituary notice of Mr. Thomas Fearn, which we extracted from the Birmingham (England) *Gazette*, it was stated that he was the probable inventor of the electroplating process, the patent of which he sold to the Messrs. Elkington. Mr. T. Spencer writes to the *British Trade Journal* to deny this and to claim the invention for himself. He says:

"Those who wish to see the first electroplated article—as I suppose it to be—may have their curiosity gratified in the Liverpool Museum, in which there is an electroplated teaspoon with my initials engraved on it, and the date, May, 1838. This date, be it observed, is above two years in advance of that of the Elkingtons' patent. This spoon, though it was not in the legal sense sold, was thickly covered with silver, and given to my friend, Mr. Joseph Mayer, the eminent silversmith of Liverpool, on the day, as it happened, the date was engraved on it. Its history is briefly this: During my electro experiments, Mr. Mayer had frequently seen their results in copper, and naturally became desirous to know how far the art was applicable to the deposition of silver. So for this purpose he sent to me, at my request, a white metal teaspoon, and with it a flattened-out Mexican dollar to act as the opposing plate in the small galvanic arrangement I had then in use. Some fortnight after I took it to him, thickly coated with silver, but rough as it came from the trough. I remember it was weighed and found to be about $\frac{1}{4}$ oz. heavier than when it was received. The object in putting so much silver on was to test the adhesion of the one metal to the other. "I suggested that the better mode of arriving at this would be to cut into it deeply with a graver, which Mr. Mayer had done accordingly, and on calling on him a few days after I was told it had stood the test I suggested. I then saw that he had got his engraver to put my initials on it, with the date."

Germination at Low Temperatures.

It has recently been discovered that seeds will germinate even if placed between blocks of ice. M. Haberlandt has conducted further investigations into this subject, and has kept a large number of different kinds of seeds at a temperature of 45°. In 23 days 8 species out of 22 showed distinct signs of germination, while others remained sterile to the end. M. Haberlandt plausibly conjectures that those grains of any given species which will germinate at a lower temperature than others will require a less amount of heat for their perfect development; and thus by artificial sowing,

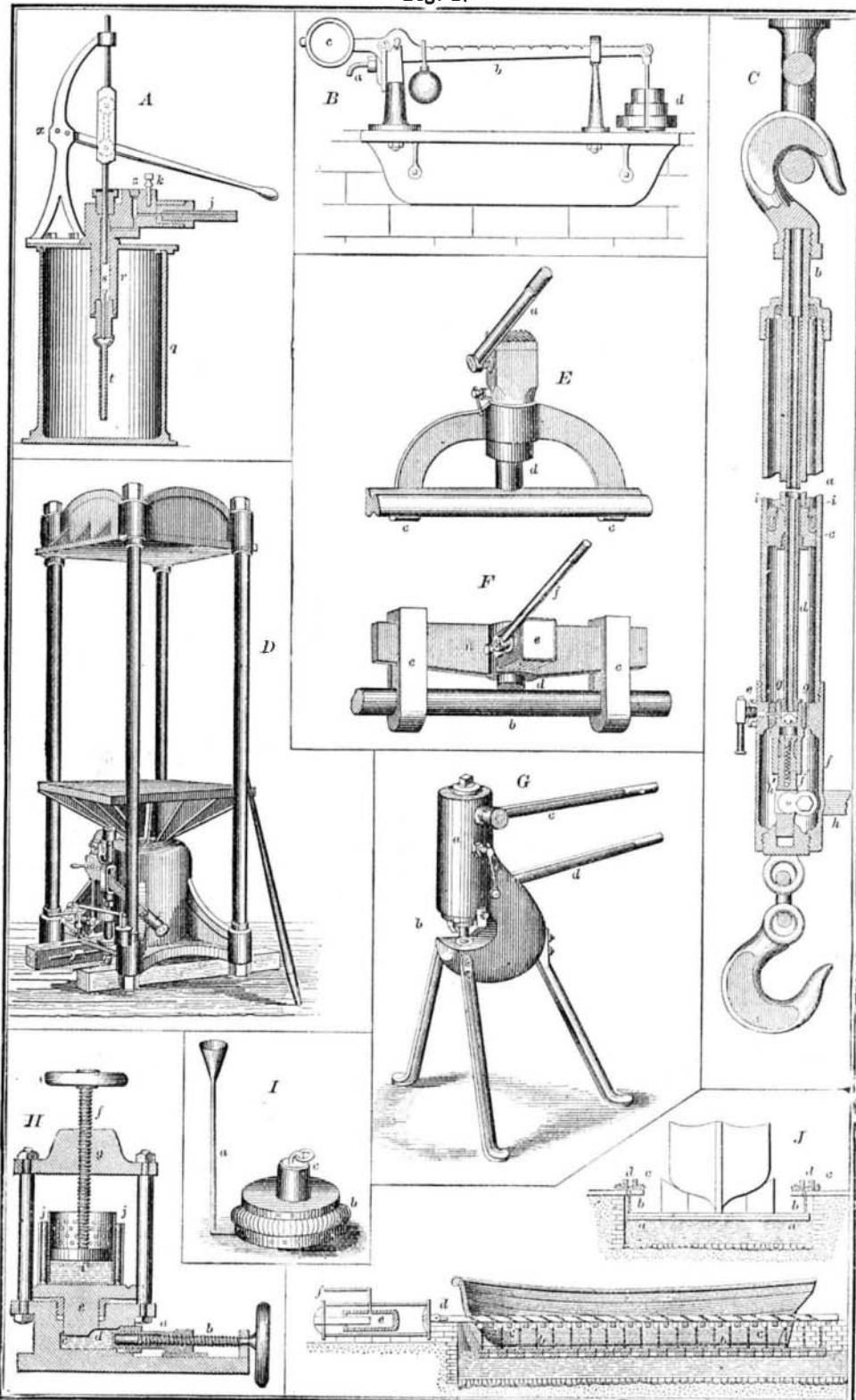
a variety might perchance be obtained precocious in habit and needing little heat.

Chinese Immigration.

Last April the Senate of California appointed a commission to ascertain the condition of the Chinese in that State and the social, moral, and political effects of Chinese immigration. The commission began to take testimony in San Francisco, April 11, and in 15 days examined more than twenty Chinese and an equal number of whites. The examination related to marriage, the use of opium, labor contracts, the character and power of the Chinese companies, the condition of women, Chinese intelligence, their purpose in coming, the effect of such immigration in other countries, and the political consequences here, as well as the moral, social, and religious bearing of their presence. The evidence is almost unanimous that all who come are imported by Chinese companies; are the lowest of their race; aim only to earn five or six hundred dollars; are secretly banded; regard no oath or law they dislike; introduce incurable diseases; corrupt American youth; refuse to accept American education, and therefore can never be fitted for citizens. The testimony is long, and there is much repetition, but it substantiates the charges made against the Mongolians; and now that labor is such a drug that more or less which is desirable on every ground is returning to Europe, and Euro-

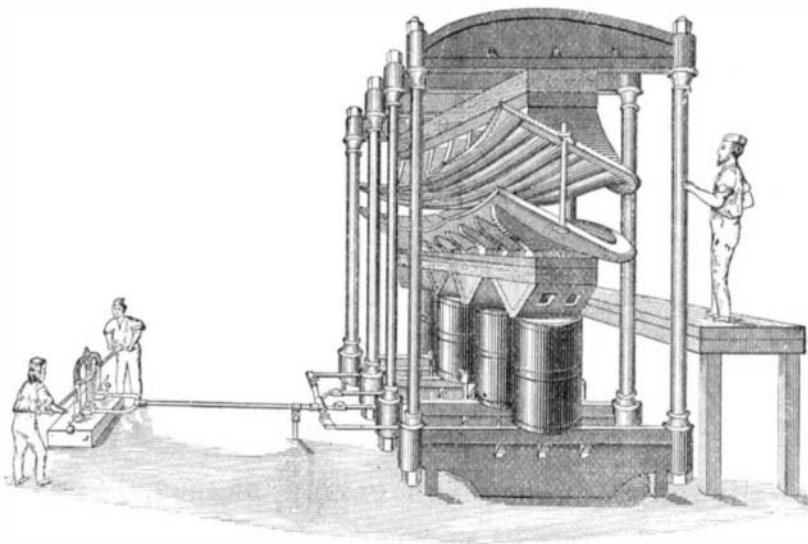
pean immigration is prevented, there is a stronger probability that whatever can be done will be, and earnest measures adopted to prevent the further influx of a population foreign to every interest as well as to every prejudice of the country.—*Bulletin of the Iron and Steel Association.*

Fig. 1.



HYDROSTATIC PRESSES.

Fig. 2.



Hydraulic Press.

to the platform, so that the vessel is thus slowly raised. The engravings give both a longitudinal and an end view of the apparatus.

Another application of the hydraulic press is illustrated in Fig. 2. Here it is used in making metallic life boats in

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