

IMPROVED AIR SPRING FORGE HAMMER.

The annexed engravings represent the spring forge hammer of Mr. Hotchkiss, in which air is used as the elastic medium, and the principle of which has already been applied, during the past fifteen years, to a wide range of purposes; and it is capable of still further extension. Such hammers can be made of nearly any weight, the heaviest being suited for use on heavy forgings, for ore crushing, and similar duty; and small ones are employed for planishing metal surfaces and forging spectacle bows, corkscrews, and other fine work. Another and a curious use for the invention is its application in a water engine for blowing organ bellows; the escape holes in the cylinder being useful in overcoming the dead center, on which the piston would ordinarily remain, causing a tremulous effect on the sounds issuing from the pipes. Five hundred of these hammers, of various sizes, are now doing good work in all parts of the country. The inventor states that a 40 lbs. hammer will draw a three inch bar three feet at one beat.

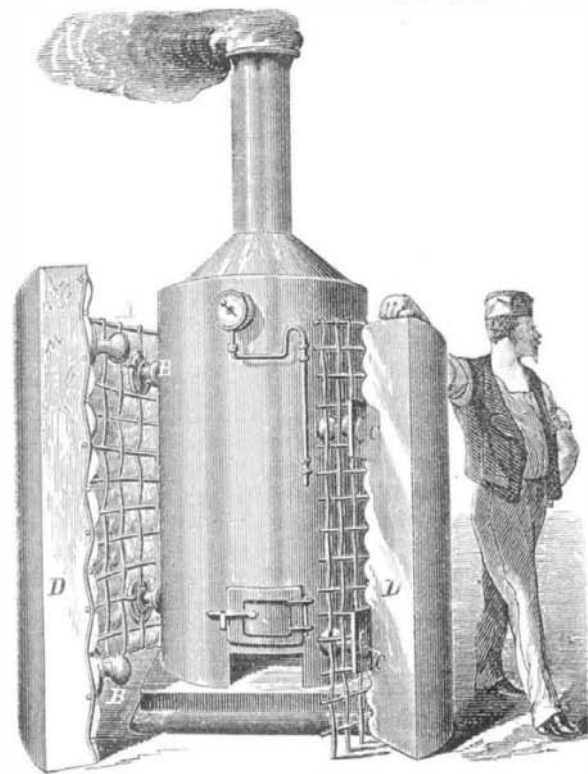
By the construction, as shown in the engravings, the cylinder and hammer move in vertical slides; each blow is square, and the work can be forged with the greatest nicety as well as rapidity; the number and force of the blows can be varied at will by the operator, and the machine, it is claimed, requires less power than any other hammer giving the same blow. The air is compressed by the piston, B, in the cylinder, A, the fit being airtight, as shown in Fig. 2. The slides, C, keep the cylinder and piston vertical, and the motion of the latter is effected by the rotation of the crank disk, E, driven by belting, and operating the connecting rod, D. The holes, F, in the cylinder, A, allow free ingress of air, thus insuring a perfect cushion at each stroke. G is the anvil, which, being movable, can be readily changed to suit any work for which the machine is used. A guide pulley, operated by the treadle, I, for tightening the belt into action is also provided.

The claims cover the use of an interposed spring cushion of air, rubber, or metal, and an actuating mechanism having a definite reciprocating motion. A considerable reduction in the expense of these machines has lately been effected by casting the whole frame in one piece, as shown in Fig. 1.

For further particulars, address Messrs. D. Frisbie & Co., manufacturers of the machine, 26 and 28 Grand street, New Haven, Conn.

A NEW BOILER COVERING.

A new boiler covering, the construction and mode of application of which is represented in the accompanying engraving, was patented July 21, 1874, through the Scientific American Patent Agency, by Messrs. Alonzo Irons and Lewis Clayton, of N. W. corner of 13th street and Washington avenue, Philadelphia, Pa. A web of coarse wire cloth, A, is provided with a number of short studs, B, secured to it by

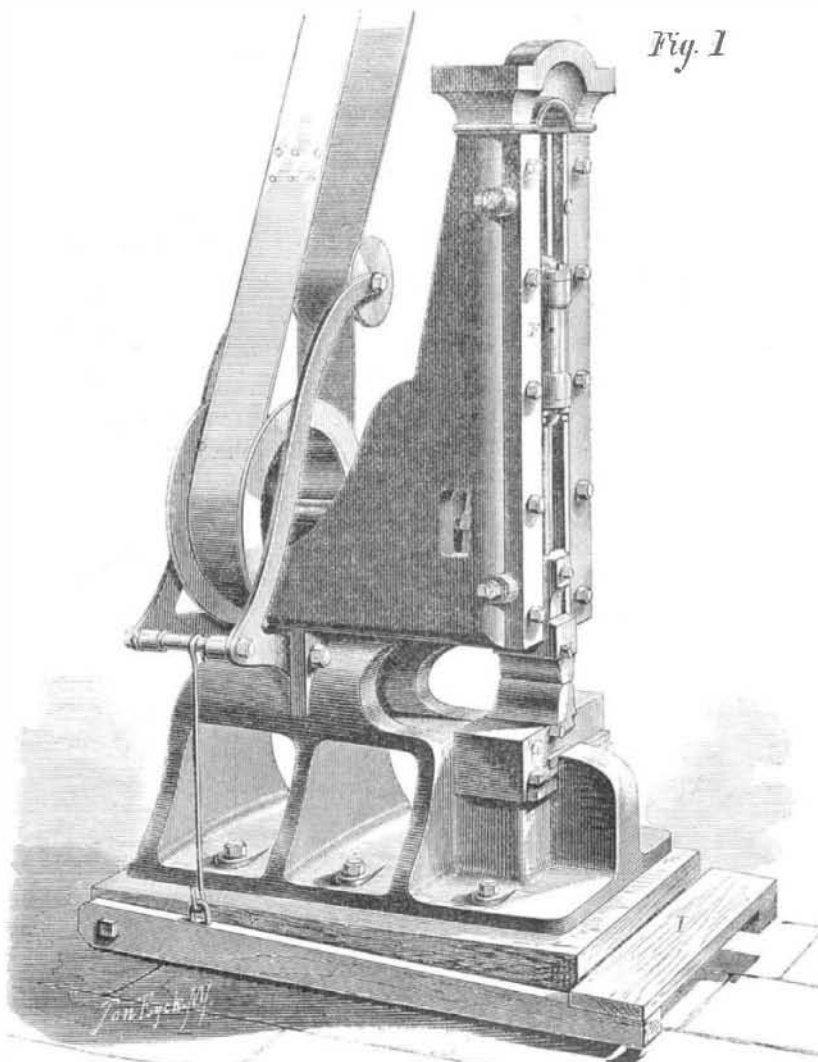


washers, C, to form an inside fastening and to prevent the sweating of the boiler, when cold, from loosening the cement. To this fabric is applied a non-conducting compound, D, and the whole is supported at a short distance from the boiler. This affords an air space between the casing and boiler, which not only largely aids in retaining the heat in the latter, but also prevents cracking or breaking, as might be the case were the covering placed directly in contact with the generator, and so subject to the contraction and expansion of the boiler shell. In practice the wire cloth is first fitted to the boiler, and the non-conducting compound subsequently applied in a plastic state.

For further particulars address the inventors as above.

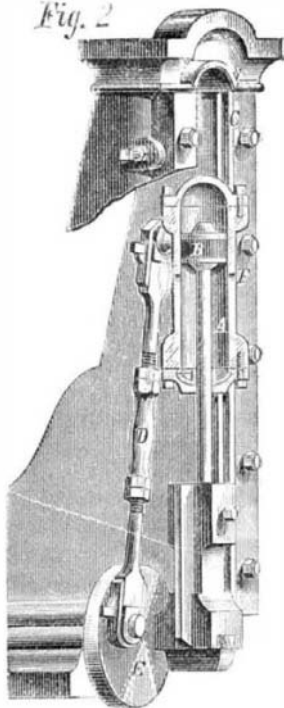
Soda Hailstones.

On the 9th of June of this year, a great hailstorm was experienced at Elizabeth, N. J.; and of the many hailstones which fell on the occasion, two have so peculiar a history as to deserve especial mention. One of them, when found "appeared to be a mass of ice, but as the ice melted away, there remained a clear crystal of this salt"—meaning the salt referred to in the analysis stated below—"which, in drying, became pulverulent on the surface, and finally broke



HOTCHKISS' AIR SPRING HAMMER.

Fig. 2



up. It was taken from the ground by a neighbor, Mr. James H. Hooley, and the facts are attested by a score of witnesses."

The above extract is contained in a letter from Mr. Jacob M. Clark to Professor Thurston. The letter, together with the solid residue said to have been left by the hailstone on evaporation, was placed in the hands of Professor Leeds, of the STEVENS INSTITUTE OF TECHNOLOGY, who found that it consisted of water 14.50, soda 49.41, carbonic acid 35.07, loss, 1.02, in 100 parts, which is carbonate of soda.

A subsequent letter alludes to the experience of another observer, who "picked up a singularly large, clean hailstone and placed it in the mouth; but it proved so intensely bitter that it was thrown away at once."

It is easy to discredit these curious observations by the supposition that the hailstones fell upon, or were preserved in, vessels containing carbonate of soda; but if the observations and statements of credible witnesses are to be accepted, it must be put on record that hailstones containing carbonate of soda actually fell at the time and place indicated.

J. C. B., JR., writes from Berlin, Germany: "The good the SCIENTIFIC AMERICAN has done the world is not to be estimated in dollars and cents. One must go early to the library here to find the SCIENTIFIC AMERICAN."

The German Navy.

The Friedrich der Grosse, which has just been launched is the seventh iron-cased frigate of the German navy, and the eighth being expected to leave the stocks early next summer, the autumn of 1875, or, at the very latest, the spring of 1876, will see a rather formidable squadron assembled off the Oldenburg coast. By that time Germany will be mistress of eight iron-cased frigates, carrying 92 guns of the very heaviest caliber (mostly 400 and 500 pounders), and set in motion by engines with a total of 48,500 horse power. In addition to these first-class ships there are three more ironclads of minor proportions, making up together 15 heavy guns and 5,400 horse power. Twelve corvettes (the twelfth will be ready next year), with 168 heavy guns and 18,600 horse power, attended by 24 gunboats, mustering 59 guns and 8,850 horse power, complete the fighting array of the youthful but aspiring fleet. Of the corvettes some have 20, others 10 or 15 guns, 3 of the number carrying only 5, with engines of above 2,000 horse power, being intended to act on the Alabama plan in far-off seas. The names of these peculiar vessels, which will probably be heard of in the next war, whenever that may be, are Ariadne, Louisa, and Freya, the last being yet on the stocks. The whole German navy, including, beside the above, 3 sailing frigates and 3 sailing brigs, already numbers 55 ships, 425 guns, 73,768 tons, and 84,770 horse power. About 4,000 sailors, with 1,000 marines, 500 artillerymen, and officers in proportion, were this year reported in the Blue Books. Next year will witness an increase of about 2,000, in consequence of the new ironclads being equipped for active service.

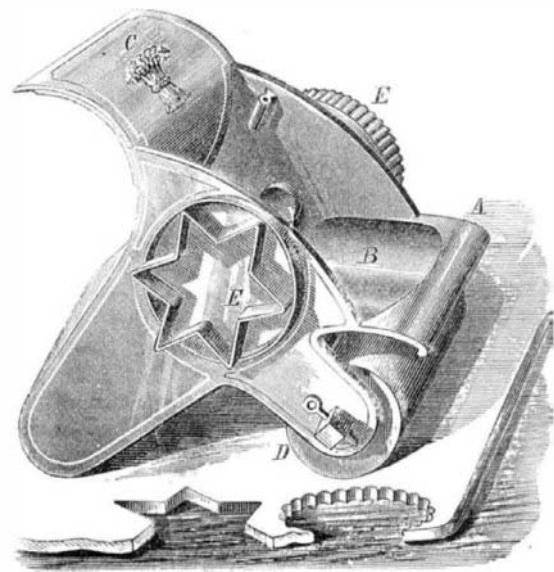
Europe at this moment has 142 ironclads fit to be placed in line of battle. Of these England owns 38; France, 28; Austria, Russia, Italy, and Turkey, 15 each; Germany, 8; Spain, 7; Denmark, 3; Greece, 2. The tonnage of the German ships and the size of their guns are, however, so uncommonly great that, although few in number, they are supposed to be more than a match for any navy, those of England, Russia, and France excepted.

DOUGH KNEADER AND CUTTER.

Another ingenious device for lightening "woman's labor,"—this time in the kitchen. Our engraving represents an invention which is a dough kneader, a cutter, a scraper, and a

rolling pin, all in one,—which abolishes the use, first of the bare fists; second, of an inverted spice box, or whatever else may be the favorite implement for molding cookies, cakes, or crackers; third, of the table knife blade; and, fourth, of the time-honored and cumbersome wooden roller. Besides it saves steps, in having the three last mentioned implements always conveniently at hand, and economizes one's stock of patience in that rather tedious though not to be neglected operation of kneading the dough.

The device is made of tin, suitably strengthened inside. The forward U shaped portion constitutes the kneader. When this is in use, the palm of one hand is rested on the part, A, the fingers being placed in the curved handle, B, so that a secure hold is thus obtained. To gain greater power, the other hand is applied to the curved upper end, C, the



edge of which portion, sharpened, forms the scraper for gathering the dough or dividing the same, as required. At D is the roller, the shaft of which enters apertures in the body, and is secured by pins so as to allow of ready detaching. Lastly, the dough cutters, E, of different shapes, are applied by central tubes to sockets at both sides of the body, and may be used with the latter as a handle, or be removed and used separately.

Patented through the Scientific American Patent Agency, April 21, 1874, by Mr. Frank Mückli. For particulars relative to sale of the patent, address the present owner of the same, Mr. Valentine Lorra, Galveston, Texas.

A GOOD BRITANNIA METAL.—Tin, 150 lbs.; copper, 3 lbs. antimony, 10 lbs.