

Science and Art.

Single and Double Steam Engines.

One of our correspondents—John Gill, of Patriot, Ind.—in a postscript to his letters, makes the following remarks respecting the above subject, which has been alluded to on two former occasions, in previous numbers of the SCIENTIFIC AMERICAN:

"Has any one tried double and single engines with the same boilers and machinery, so as to give a fair decision as to which used less steam? I have always been under the impression that one engine of double capacity, and plenty of fly wheel, used steam more economically than two, but have never seen a fair trial. To have it tried aright, all the engines ought to be equally good; for if you take out a badly constructed engine, and put in two of better make and more scientific proportions, as a matter of course, you would do more work with the same boilers. This is an important matter to be settled, there being some advantage in regularity in working two engines; but, by using well constructed spring couplings, the back lash of a single engine can be mostly done away."

[We have no record of any such experiments as those to which our correspondent refers; it is, indeed, positively necessary that the conditions for a trial should be those which he describes. The common opinion respecting the use of double and single engines is, that the former produces a more steady motion than the latter, and are therefore to be preferred for driving machinery; but it is not generally believed that they use less steam.

Ames' Universal Square.

The annexed engravings represent and illustrate a "Universal Square," for which a patent was granted to Nathan Ames, of Saugus, Mass., on the 6th of July, 1852, but never before thus brought before the public. This square is simple, and combines in a convenient form five useful instruments, viz.: the "Try-square," the "Miter," the "T-square," the "Graduated Rule," and the "Center-square," for finding the center of a circle.

Fig. 1 is a perspective view of the instrument; fig. 2 shows the method in which it is applied as a center-square for centering a circle; fig. 3 shows the different ways in which it is applied as a miter, and fig. 4 shows the application of the instrument as a T-square, a try-square, and a graduated rule.

In the Patent Office Report for 1852-3 is the following description of the instrument, and its application as a center-square:

"The general principle on which the instrument is based is well known to geometers, viz.: that if two tangents (or straight lines touching the circumference of a circle) be extended till they intersect each other, a straight line bisecting the angle between them will pass through the center of the circle. The instrument consists of two arms, A B and A E, fig. 1, placed together at right angles to each other, in the manner of a carpenter's square, but of equal thickness, and having their surfaces 'flush,' upon the upper surface of which arms a straight ruler, D A, is fixed at its end in such a manner as to have one of its edges at the inner angular point of the arms, and that edge extending midway between them, or bisecting the angle between them. The ruler can be braced firmly by a bar, B E, running across between the extreme ends.

"If the mechanic wishes to find the center of a circular wheel, he places the instrument upon it, fig. 2, with the two arms both resting against its circumference, in which position the edge of the ruler will run across its center. A straight line is marked in this position, and the instrument is again applied to another part of the circumference, so as to mark in the same manner another line intersecting the first. The point of intersection is, of course, the center of the wheel. The whole is the work of a moment."

The first claim of the patent is for the application to an instrument of the geometrical principle alluded to above; and the second for the union of the above with the common try-square by means of the bar, B E.

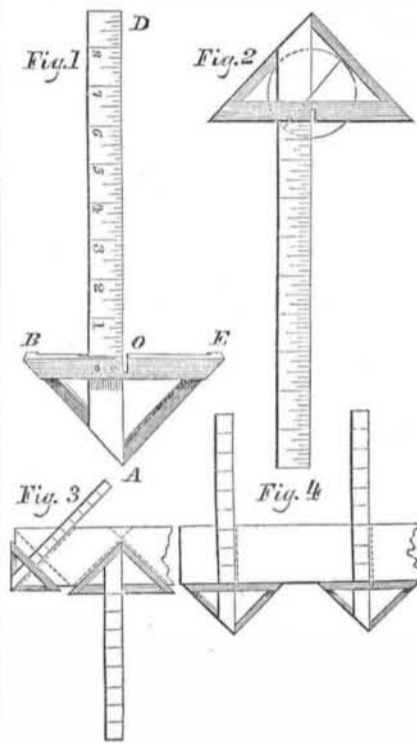
At O, fig. 1, is a slot in the bar, B E, to ad-

mit a scratch-awl, or the point of a knife. This slot is also cut out in such a manner on the under side, that the point of the marking instrument may pass under the bar, making a continuous mark, whenever it is desirable, from D to A.

As a center-square, alone, the instrument is invaluable to every mechanic.

A glance at fig. 3 will explain the different ways in which the square may be used as a miter. By simply placing the instrument over a square corner to be mitered (as seen at the left of the figure), without any adjusting by the eye, is sufficient: the tongue cannot fail to bisect the angle. By mitering both corners, the longitudinal center may also be readily found, the point where the two lines intersect being equidistant from the two edges. The point where the tongue leaves the edge of the board will also be found to be just the width of the board from the end.

Or, again, as seen at the right of fig. 3, there are two miters more. The cross bar, B E, fig. 1, resting against the edge of the board, the two sides of the square, B A and A E, will both be miters.



The application of the instrument as a graduated rule, T-square, and try-square, will be easily understood by inspecting fig. 4.

As a T-square, it is peculiarly strong, and free from liability of getting out of true. The tongue, D A, being fastened, as it is, into the triangular frame, B A E, cannot be moved or knocked from its place. The same remark, of course, will also hold in regard to the instrument both as a miter and try-square.

It is also obvious that there are other ways than those represented in fig. 4 in which it may be applied as a try-square. That portion of the tongue between D and O, with either half of the cross-bar, B E, forms a complete carpenter's try-square, and may be used as a substitute for it in every instance. The outside of the frame—the angle, B A E—is also a perfect square, and often very convenient. In short, it combines, in a most convenient form, so many useful instruments, no mechanic's list of tools can well be complete without a Universal Square.

More information in regard to the instrument may be obtained by letter addressed to the patentee.

New Copper and Silver Mines.

California papers announce the discovery of new mines of the above metals, which are very promising in richness. They are located 30 miles from the Gila river, and 25 miles north of the new boundary line between Mexico and the United States. It is designed to transport the ore and metal for shipment in small river steamers to the Gulf of California, where it will be taken on board and shipped to the Eastern States or England for smelting. The ore is said to be inexhaustible, and increasing in richness as it is followed. Not far from this locality is the celebrated silver mine of Mina de Plancha de Plata.

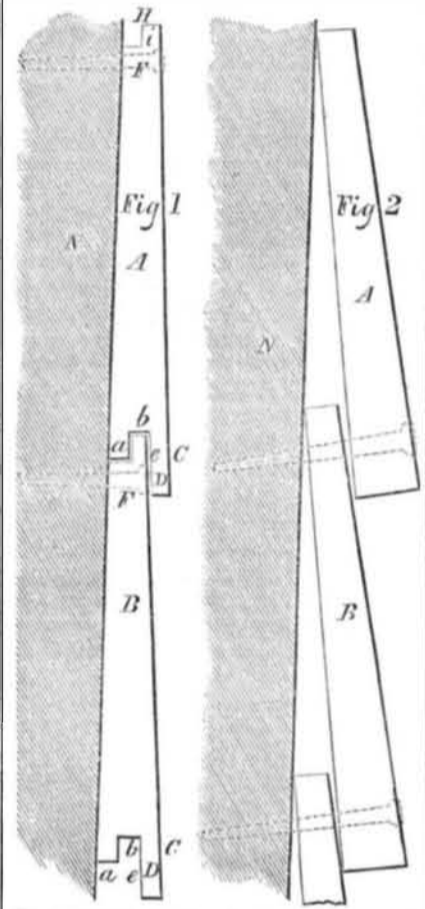
We imagine that the projectors of this enter-

prise will find a rather sorry business, so far as profit is concerned, to transport their ores, first to the Gila, and thence by different shipments to this coast or England.

Baker's Patent Clapboard Jointing.

The annexed figures are two views of an improved method of jointing clapboards for the siding of houses, for which a patent was granted to William Baker, of Utica, N. Y., on the 16th of May, last year.

The nature of this invention consists of a peculiar matching of the boards, so that they stand edge upon edge, instead of hanging upon the nails in the usual way; the chief characteristics of clapboarding being still preserved in one board overlapping the other, to shed the rain. Fig. 1, is a section of these boards nailed against the frame of a house to



show the new method of laying them up, and the jointing of them; and fig. 2, is a side view of the common old method of clapboarding. A, B, are two of the new clapboards nailed to the stud, N. a, b, c show the matching cut of the lower end of a clapboard. It is made to correspond with the upper edge, H, which has a lip, i, so that the two will fit together, as shown at C. The line, e, of the cut is a little oblique, to correspond to the front line of the board, so as to make one board fit close to the other. The first board, B, being laid on and nailed at F, the lower edge of the next board, A, when brought to its place, as shown, will be firmly held at the lock a, b, c and the nail, F, will be completely covered by the lower extended lip, D, without nailing. The lip, D, is made about three-fourths of an inch in length, and the lips, a, and i, are each about one-fourth of an inch long. The difference between the methods of clapboarding, as shown in the two figures, will at once convey a just idea of the superiority of the new one. When a house is clapboarded in this manner, not a nail can be seen, and the matching is much tighter and stronger. These boards are made by splitting a thicker board diagonally through in the ordinary way of making two feather edge clapboards; and the machinery of Mr. Baker, for doing this, also cuts the proper matching on the edges, at the same time, and as fast as common clapboards are made. The boards, it will be observed, lie flat against the stud, N; whereas, by the old plan, fig. 2, they only touch the studs at the corners. At the place where they are nailed (fig. 2) they are not truly in contact, so that they are liable to be split in nailing, for the want of a solid bearing to drive against. A small nail can be used for the new clapboards, as it is driven through one board only and at the thinnest edge, so that there is no danger of splitting. These boards can be put

up more rapidly than the common kind, and they make a much tighter, more handsome, and warmer building.

More information may be obtained by letter addressed to the patentee, at Utica.

Worth a Trial.

It is stated that Mr. John Brush, of Brooklyn, N. Y., has saved the plums on a number of trees, the present season, by binding bunches of tansy upon the limbs, in several places. The fruit upon the trees thus treated ripened to perfection, while that near by, not thus protected, was entirely destroyed by the insects.

Literary Notices.

**PATENT REPORTS.**—We are indebted to the Hon. Wm. H. Seward, Senator, to Hon. A. C. McClelland, Secretary of the Interior, to S. T. Shugert, Esq., Acting Commissioner of Patents, and to Hon. J. C. Heeler, for copies of the report of the Commissioner of Patents for 1854. This report is decidedly the finest specimen of typography issued under the auspices of the government that we have seen for a long time. Accompanying the usual reports of statistics and claims of new patents, there is an extra volume of diagrams, which are intended to illustrate, in part, the prominent features of each invention patented during the year. These diagrams are necessarily so reduced as to occupy but a small space, while, being in outline, they are not very attractive to the eye. As an appendage to the report, they will prove of convenience, and will otherwise materially enhance its value as a book of reference. The diagrams were first drawn and engraved upon copper, then transferred to wood, from which they are printed. This volume of outlines was originated by the Hon. Charles Mason, late Commissioner. We trust they will be continued every year. In addition to the foregoing, we have received from Mr. M. C. Gritzner, C. E., a separate volume of the same diagrams, the impressions being all taken from the original copper plates. The drawings were made by Mr. G., under government orders. They reflect great credit upon his skill as a mechanical draughtsman. The plate impressions are much more clear and exact in appearance than the wood prints. Mr. Gritzner's volume is also better arranged, and some inaccuracies contained in the official volume are corrected. The price of the volume is \$3.50, with the Commissioners report gratis. Address Mr. Gritzner as above, at Washington, D. C., for copies.

**FORRESTER'S PLAYMATE.**—For September—is received. This is a capital magazine for the young. Its contents are original, and its illustrations very good and appropriate. While it has articles upon a great variety of subjects, its chief design seems to be to teach boys and girls to think for themselves. Above all, "its moral tone," as the New York *Chronicle* truly remarks, "is unexceptionable," and parents need have no fear on that point. The work is edited by Mark Forrester, an old and favorite writer for the young folks. Among other interesting novelties in the editor's chit-chat for this month, is an enigma, for the best solution of which is offered a copy of Harper's Family Bible, worth twenty-five dollars. The *Playmate* is published monthly, at a dollar a year, by William Gould & Co., Boston, Mass. The July number begins the third volume.

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