has a conical depression in its lower face to engage with a corresponding projection on the follower, E. The form of the latter is clearly shown with that of the other detached portions in Fig. 2, while Fig. 1 represents the apparatus set up.

The material to be pressed is placed between the perforated bottom, on B, and the follower. By suitably turning the screw, the latter is carried down, squeezing the contents of the press, the juice or liquor escaping as already noted. It is claimed, in addition to the advantages already referred to, that, by the use of a follower with a conical bearing in the nut, and guided by the central tube, a more even and level bearing on the mass to be pressed is obtained than can be got by the ordinary screw press. After the liquid has been expelled, the cake may be removed by lifting the central tube, B, which brings the mass out with it, and from which the latter can be easily broken away.

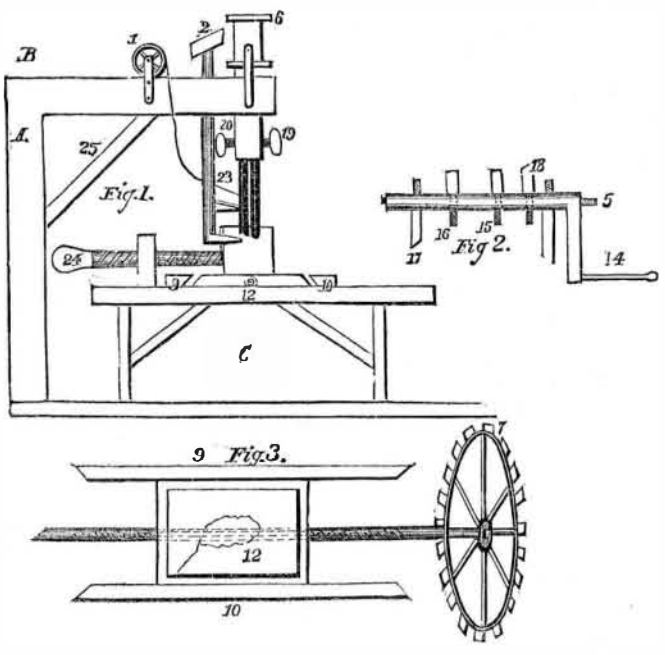
The inventor informs us that the apparatus is well adapted for pressing fruit used in the manufacture of wines, cider, and jellies, and also for dairy purposes in compressing cheese and butter.

Patented September 2, 1873. For further particulars regarding sale of patent rights, address Mr. Joseph Harlan, Lexington, Scott county, Ind.

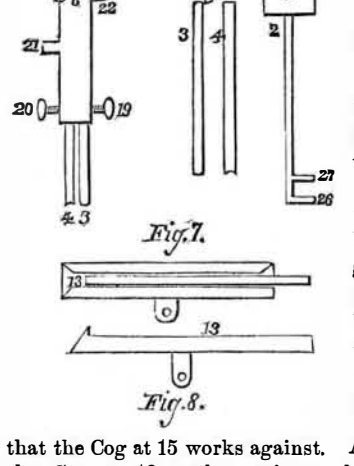
## THAT ANCIENT SEWING MACHINE.

We referred, in a recent issue, to the discovery of an old sewing machine patent among the records of the British Patent Office, which, for a short time past, has excited considerable interest in mechanical circles. We present herewith engravings of the drawing attached to the specification. The latter we give below verbatim. The patent was granted to Thomas Saint (cabinet maker) on July 17, 1790, for "An entire new method of making and completing shoes, boots, spatterdashes, clogs, and other articles, by means of tools or machines, also invented by me for that purpose, and of certain compositions of the nature of japan or varnish, which will be very advantageous in many useful applications." It is numbered 1,764, and dated July 17, 1790.

The specifications describe three separate machines; the first a rather primitive contrivance for spinning and doubling the thread, the third for plaiting and weaving, and the second for "stitching, quilting or sewing." The last mentioned is the device represented, which is described as follows: A B C is the frame. Fig. 1 is the reel for the thread. 2 is a spindle which, moving to the right, conveys the thread to the needle at 4, and moving to the left again takes hold of




the stitch and keeps it tight till the needle has brought another stitch through the last taken; and so it goes on alternately until the whole article is completely stitched. 3 is the awl that makes the holes for the needle to pass through. 5 is a spindle that goes through the poppet at 6; while by turning the spindle at 5, the awl and needle is worked by the cogs 15 and 16, which are in the spindle at 5; and the motion of this spindle gives motion to the prongs 26 and 27, which are in the spindle at 2. 14 is a cog that gives motion to the wheel 7, which gives motion to a slide at 12 which moves along the grooves at 9 and 10 by means of a screw that is fixed in the wheel, to which slide the article is fixed for stitching. The prong 26 goes into a hole at the slide 13 and gives motion to it "which draws the thread on the under side of the article and holds it tight till the next stitch is taken, and so on till it is done. 22 in Fig. 6 is a shoulder that the Cog at 15 works against. At 21 is a shoulder that the Cog at 16 works against; these work (in?) the Poppet at 6. 19 and 20 are two screws to fasten the Awl and Needle 3 and 4: in 23 is the thread passing in between the Awl and Needle which the eye of the Needle receiveth. 24 is a screw to regulate the distance from the edge or side of the article you are stitching. 25 is a Brace or support to the top of the Machine. The Cogs 14, 15, 16, 17 and 18 in the Spindle at 5 should be so fastened as to be screwed up or down according to the quality of the article and fineness or coarseness of the stitching required."




The machine was destined for use in sewing together outside and inner soles of shoes, and for joining legs, spatterdashes, etc. It seems quite certain that there was no eye-pointed needle, but that the lower end of this implement, which appears to be fractured, is meant to be notched in order to push the thread through the work.

# Correspondence.

### Crude Oil for Fuel.

*To the Editor of the Scientific American:*

In your issue of October 4, in an article on the combustion of petroleum as fuel and for manufacturing gas, you set forth that the best result of combustion of petroleum as compared with coal was as 2 to 3. Now Mr. Daniel Fisher, at Fisher Brothers' storage tanks in Oil City, Pa., has a burner in operation that he has used since last winter continuously. He uses from one barrel and one half to one barrel and three quarters during the run of ten hours, using in the same time one tun of coal. He uses steam as a motive power, throwing a jet of oil into a chamber, thence through a small opening in the chamber to the furnace, the jet being accompanied by a current of air, fed in connection with the oil, of such quantity to make perfect combustion, there being no smoke. Mr. Fisher has not patented his invention, nor does he propose to. A. L. S.

REMARKS BY THE EDITOR.—The idea intended to be here conveyed is, we presume, that 74 gallons of crude petroleum, or 518 lbs., is made by means of Mr. Fisher's apparatus to generate as much steam power as a tun of coal. There is evidently a mistake somewhere. The power of the engine is not stated, and therefore we cannot judge of the economy of the fuel. But we may observe that, if the engine and boiler are well made and intelligently run, then two pounds of coal per horse power per hour would be consumed, on which basis a tun of coal would drive a steam engine of 112 horse power for one day of ten hours, and it would require 1,494 lbs., or 5 barrels, of petroleum to do the same work.

### The Hot Air Engine.

*To the Editor of the Scientific American:*

I have read with much interest the suggestions lately made by the different correspondents for the improvement of the hot air engine. I have had the care of a caloric engine for almost two years. It is of 2½ horse power. I am troubled to keep the upper door and also the poppet valves tight. I would throw out two suggestions that I think would make them better as far as valves and doors are concerned, they are these: Have the door seats cast separately from the engine, and have them fastened to it by a flange around the seat, with bolts screwing into the engine; the door and seat could then be easily taken from the engine and planed or ground together as the case might require. As they now are, it is a vexing tedious job to grind them to a surface by hand, and the change might sometimes save the removal of the whole furnace to a shop for repairs.

I think that the poppet valves would be better if they were made somewhat like a cone, having the same bearing surface as those in use at the present time; this would make them less liable to warp, they would be more quickly ground together if they leaked, and by no possible means could anything lodge on the valves or seat. Sometimes we have had the engine nearly stopped by small lumps of coal catching between the valve and seat; and at others it bothers me to start it for the same reason. FRANK O. CLARK.

### Illuminating Gas from Crude Petroleum.

*To the Editor of the Scientific American:*

As you are happy to chronicle any new facts, let me make a statement of what has been done at our mill at Passaic, N. J., since January, 1871, when we had works erected for us, by Dr. W. C. Wren, of Brooklyn, N. Y., for the manufacture of illuminating and heating gas from crude petroleum. The works are the invention of Dr. Wren, and we have ever since been using them to light our mill (which we run all night) with the following results:

First, we use crude petroleum (which is quoted at 6 cents per gallon) and make a fixed permanent gas of eighty candle power. Secondly, we have no difficulty in making the gas. Thirdly, we make, on an average, more than four thousand feet of gas of the above candle power from one barrel of crude oil, which we use through a burner consuming one foot per hour and one foot and three tenths per hour. The barrel of crude petroleum, at the rate of ten cents per gallon, costs us, when made into gas, seven dollars; that is, in practice it costs us seven dollars for four thousand feet of petroleum gas that goes farther and gives us a better light than seventy dollars worth of coal gas at three dollars and a half per thousand. The above is the result in actual practice.

If we used coal gas, we would want five feet and six feet burners for the same light we now get with a one foot and a one and three tenths feet burner. We have now had the works in steady and constant use for more than two years and a half. This is no "statement of the inventor," but plain indisputable fact by a consumer.

The retort for making the gas is a simple contrivance, and is not given to choking with carbon, as you seem to think probable. It is so simple and easy to run that we take any man out of the mill and set him at it.

At some future time (not to use more of your space at present) I will give you some of the results of heating with petroleum gas. MILES WATERHOUSE, Superintendent.

52 and 54 Murray Street, New York city.

REMARKS BY THE EDITOR.—We are glad to make public the excellent practical results here given for the Wren process, which is evidently a discovery of much importance. The apparatus employed involves, we believe, the employment of a series of chambered retorts, through which the oil is slowly passed.

### Strange Lightning Freak.

*To the Editor of the Scientific American:*

About twenty miles east of Santa Fé lay the remains of an ancient Indian city. The church (which is, or was ten years ago, complete) has been so much appropriated by the neighbors that the roof has caved in and only the outer walls are now standing, In one corner, near a tower, a ten year old boy recently took refuge from a thunderstorm. The lightning struck the north side of the tower, tearing the adobes, of which the church is built, for about three feet downward; it then went inside the wall (how cannot be seen) and came out again through the wall of the church, as is shown by an aperture, at the hight of the boy's head. His hat shows a large hole; and when his father found him, he showed no sign of life, his eyes were open and his arms *a kimbo*, as if calmly awaiting for the storm to pass. His outer garments are entire; but his shirt is somewhat torn on the back and his drawers are ripped down the left leg. Some scientific travelers advised the father to break into the wall, as they believe that metal inside attracted the lightning and caused this irregular course. He tried and found that there is, inside, a separate wall, apparently built after the original wall was finished, the entire being five feet thick.

About two centuries ago, the Indians had troubles with Spain, and closed up their wells and mines, and left. It is possible that the priests at that time secreted their precious metals in masonry. This will soon be found out; but this is one step more to destroy the remains of strange early civilization in America; and moreover, the Indians (Montezumas) are fast dying out. L. G. FELLNER.

San Cristoval, New Mexico.

### The Bisulphide Auxiliary Engine.

*To the Editor of the Scientific American:*

Your correspondent, Mr. Joel A. H. Ellis, does himself and his engine great injustice when he says that in it "the heat is used twice;" and this is no mere question of words, for he implies that his machine is a kind of perpetual motion, and leads one to ask why, if the heat can be used twice, may it not in some similar way be used three or an indefinite number of times. Such a statement is calculated to bring into disrepute a really meritorious thing, and is productive of distrust and suspicion in the minds of power users.

The celebrated professor, the late W. J. Macquorn Rankine, has shown indisputably that the efficiency of any heat engine is in a certain way proportional to the difference of the temperatures at which the steam, or other heat vehicle, is admitted to and ejected from the machine. In a condensing steam engine, for instance, the greater the difference between the temperature of the steam in the boiler and that in the condenser, the greater the efficiency of the engine; and, disregarding the question of heating feed water and other economic adjuncts of the steam engine, by continuing the reduction of temperature from that of the exhaust steam in a non-condensing engine to that of the bisulphide condenser, Mr. Ellis has a heat engine, considering it as a whole, working between much greater extremes of temperature than is possible with either the steam or bisulphide engine alone.

With our present light on thermo-dynamics, he may say that, in the steam engine alone a certain quantity of the potential energy, resident in the steam and called heat, is transmuted into external work, and that his bisulphide addition transmutes a quantity of the energy remaining in the exhaust steam into equally useful work; but not that he has used the heat of the steam twice. He transmutes into useful work or uses more of the heat imparted to the water in the steam boiler than can be done with the steam engine alone, but he does not use any of it twice; and a very large proportion of it he does not even use once. JOHN T. HAWKINS.

New York city.

### A White Blackbird.

*To the Editor of the Scientific American:*

It will give the ornithological world some pleasure to learn that another *rara avis* has been added to its collections. This is none other than a "white blackbird" or, more properly speaking, a "red winged starling." It was secured by Mr. E. A. Andrews, of Watertown, N. Y. While Fayette Noble, of Ellisburg, was "sitting" this gentleman for ducks on the marsh at the mouth of Sandy Creek Landing, Mr. Noble discovered a "white blackbird" amid the thousands of starlings that frequent that marsh. Of course such an object could not fail to attract attention and by dint of careful paddling, Mr. Andrews was at length placed in a position to secure this rare prize. The bird, as we have said, is of the red winged variety, a fledgling of this year, with cream colored feathers interspersed here and there throughout its snowy coat, the cream color predominating especially on the wing, where in another year the red would appear. It is unnecessary to say that the bird was a great curiosity. The oldest hunters on the marsh, who have seen myriads