to strengthen. Other engineers, examined on Monday last, gave it as their opinion that the Martin boilers were dangerous, from their liability to foam, and from the incessant care they required to prevent disaster.

It is noticeable that those most interested in the examination, and specially concerned in the verdict, express unbounded confidence in the boilers and plan of construction, and say, with all their experience, they have found little or no trouble with them. These men who thus testify are naval engineers, and it shows they are willing to abide by their testimony and risk their lives in support of their opinion.

It is not plain in the minds of those not immediately engaged in the examination of the witnesses, what decision will be arrived at by the jury, and at the day we go to prass we are unable to procure the verdict, but it would seem from the evidence adduced that the braces gave way in some manner and the roof or shell was torn in consequence. From two indicator-cards found in the engine room, the pressure on the gage was shown to be 34½ pounds; in another portion of the testimony the pressure shown by the gage is stated to be 39½ pounds; but whether this is a misprint or not we cannot say, as we were not present at any of the examinations. The coroner still continues his investigation, and when the verdict is rendered we shall publish it.

THE CLOSE OF THE METROPOLITAN FAIR.

The great Sanitary Fair has closed at last. The huge building in Fourteenth street still stands, but the garlands are gone, the lights are out, the guests have deserted it. There are no fair women passing in and out to enliven it any more, but the memory of their services remains and will never be forgotten. For over three weeks our citizens poured out their money like water for the sake of the sick and wounded soldiers in whose behalf the Sanitary Fairs all over the country have been instituted, and the net proceeds of our Fair, at the present time, reach $1,100,000, and this without counting the goods which remain on hand to be disposed of by auction. No other sensation has been permitted to interfere with the successful prosecution of this magnificent charity; and it will have an immense effect upon the conduct of our soldiers in the coming momentous campaign. The fields lie green around us and in the sunny corners of the valleys the branches of the trees are bursting into bud and bloom; in connection with this luxuriance and lavish generosity of nature the people will long remember the sympathy and devotion to the interests of the soldiers and the love of country shown by our women, as well, also, the sacrifices they have made to perform their duties to the end. The thoughtful visitor at the Fair who looked on the patient attendants sitting behind their counters and remembered that they were delicate, unused to toil, to the thousand-and-one endless questions, the dust, the noise, the heat, the incessant shuffling of feet, the blare of horns, the rattling of drums, the flapping of flags before their eyes, the overpowering odors—we say those who thought of these things fully appreciated the trial and the heroism which endured it meekly to the end. The triumph is theirs; whatever of glory belongs to the deed, let the crown for it fall upon our women; whatever of grace has been shown in their acts and intentions, let the reward of it be given to the women who have so richly earned it. All that is lovely and of good report, men cheerfully and unanimously accord to the ladies who planned and carried out the great Sanitary Fair.

SPECIAL NOTICE.

JOHN E. HEATH, of Berrian County, Mich., has petitioned for the extension of a patent granted to him July 22, 1850, for an improved machine for raking and binding grain.

It is ordered that the said petition be heard at the Patent Office, Washington, on Monday, July 11, 1864.

All persons interested are required to appear and show cause why said petition should not be granted. Persons opposing the extension are required to file their testimony in writing, at least twenty days before the final hearing.

THE arsenal at Springfield, Massachusetts, now contains 224,000 muskets.

Correspondence

The Cause of the High Price of Coal.

MESSRS. EDITORS:—The unusually high price of anthracite coal the past winter has been the subject of several articles which, from time to time, have appeared in the SCIENTIFIC AMERICAN and other journals, the general tenor of which has been to attribute the blame to the coal jobbers and miners, who, by combination or otherwise, have raised the price very much above its actual value. This may be true to a certain extent, but is not in my opinion the principal cause for these high prices. A visit made a few years since to the coal regions of Pennsylvania revealed to me certain facts which I think are not generally known, and which may throw some light on this subject. The mining business I found was no monopoly. It was not confined to those who happened to own coal lands, but was open to any one. Neither did it require a very large capital to carry on the business. Mines already opened could be obtained by paying from ten to twelve cents a tun on the amount of coal got out. All that was required were the necessary tools and an engine in some cases to draw out the coal and break it up. So far all is easy and under the control of those who mine the coal. To get the coal to market they must make use of the railroads and canals which run by the mouth of the mines, and over these they have no control. In fact the railroad and canal companies have entire control of the matter, and with them, I believe, mainly rests the responsibility of the high price of coal. The way they control it is by refusing to take it as freight. They will buy all the coal that is mined, paying their price for it, but refuse to carry it for others at any price. The miner therefore is obliged to sell his coal at the price these companies fix or not at all. What this price may be I know not, but at the time of which I speak it could be bought at the mines for seventy-five cents a tun for nut and one dollar for larger sizes. As late as last September but twenty-five cents a tun had been added to these prices; of course, then, these companies did not pay any more than that, and probably less. They take the coal at their prices, carry it to some seaport and sell it. Whatever price they get over and above the cost at the mines is so much freight. By this course not only the miners but dealers and consumers are completely at the mercy of these companies. The buying and selling prices are fixed by them, and those who mine as well as those who buy the coal are obliged to come to their terms. That this course is still pursued I have proof from a gentleman who visited the coal regions this last winter to buy coal. He found the proprietors of the mines anxious to sell at low rates, but they told him it was impossible to get the coal away except by private conveyance, and he was obliged to leave without purchasing.

Such are the facts, gentlemen, and so long as they exist we must expect to pay for our coal some four or five times as much as it is selling for at the mines. As a remedy for the evil I can suggest but two plans, viz:—1st, rival communications with the mines, and controlled by those who have as much regard for public as for private interests; or, 2d, what is better perhaps, let the Legislatures of the States interested oblige these corporations, by laws, to take coal freights the same as other merchandise is carried. When something of this kind is done we may expect to buy coal within three or four dollars a tun for what it is selling for at the mines, and not till then.

W. S. J.

Providence, R. I., April 21, 1864.

Steam on Canals.

MESSRS. EDITORS.—On page 166, current volume of your journal, I notice a communication under the heading, "Steam on the Tow-path." There is certainly much room for improvement in canal navigation, and I have longed to hear of some movement being made to this end. Hoping that the time for this improvement is near, I would offer my idea, which is neither to favor steam on the tow-path nor propellers, but instead, what I would denominate "pursuers." To understand this, I must explain. Let a hawser or cable be suspended over the middle of a canal for any distance, one or ten miles, properly secured at regular intervals. A boat with an engine of sufficient power is to be placed directly under the cable, and connected to it by machinery. By the operation of this machinery on the cable, the boat is to be moved forward, just as one would move a skiff by pulling along a rope stretched across a stream. A speed of at least 75 miles an hour could be obtained without difficulty, whilst the dangers of railroad travel would be overcome. One boat could be connected to another forming trains as on railroads. On the same plan rivers and coasts could be navigated. Though there are difficulties to this plan, yet greater have been overcome, and the day may not be far distant when traveling by water will leave railroading behind.

W. F. MAPPIN.

Mayslick, Ky., April 13, 1864.

[Seventy-five miles an hour ought to satisfy most persons. Correspondents mistake in making too high estimates, as it gives to many a good idea the appearance of a chimera, and deters sober-minded men from undertaking it.—EDS.

Sizes for Key-seats.

MESSRS. EDITORS.—We noticed, more that a year ago, that you requested some one to send you a list of sizes for key-seats for shafts, but we have waited in vain to hear an answer to your request from some one of more experience than we have. About two years ago we adopted the appended table as our standard sizes for key-seats. We have found it of great convenience to ourselves and certainly to our customers:

Diameter of Shaft. inches.	Key Seat. inches.	Diameter of Shaft. inches.	Key Seat. inches.
1	1-4 by 3-32	3 1-2	3-4 by 1-4
1 1-4	5-16 by 3-32	4	7-8 by 1-4
1 1-2	3-8 by 1-8	4 1-2	1 by 5-16
1 3-4	7-16 by 5-32	5	1 1-16 by 3-8
2	1-2 by 5-32	5 1-2	1 1-8 by 3-8
2 1-2	9-16 by 3-16	6	1 1-4 by 7-16
3	5-8 by 3-16		

We also adopted Nasmyth's standard sizes for shafting and also his taps and dies for screws. We consider the general use of a standard size for screws and also for the outside diameter of nuts to be of great importance. If the Government was to compel all their work to be done to standard sizes, we think its adoption by private manufacturers would soon be general.

SNYDER BROTHERS.

Williamsport, Pa., April 14, 1864.

[It seems to us these sizes are shallow for some metals, such as cast iron for instance; some of the large sizes decidedly so.—EDS.

Terrible Boiler Explosion in Philadelphia.

Another terrible disaster has occurred from the explosion of a steam boiler, in a Philadelphia factory. The *Evening Telegraph* of that city, dated April 25, says:—

"This morning our city was visited by another terrible boiler explosion, as sickening and horrible in its details as the one that recently occurred at the foundry of Messrs. Merrick & Sons, in Washington street. Both of these explosions, like many others of a similar fatal character, occuring on a morning after the boilers had lain idle over Sunday, afford a point which might be investigated in endeavoring to discover the cause of the affair. The yard in the center of the buildings was occupied by the boiler-house, which stood against the north wall, and was a substantial brick building, with an iron roof. There were in the building two tubular boilers, built by Morgan, Orr & Co., of this city, which had been in use about three years. The engineer who had charge of these boilers has been in the employ of Messrs. Cornelius & Baker also about three years, and every confidence was placed in his competency. At twenty-five minutes of eight o'clock, while all the employees of the establishment—about six hundred in number, men and boys—were engaged in various parts of the building, from the fifth story to the basement, the explosion occurred. Two distinct reports were heard, although it is known that only one boiler exploded. The engineer escaped on account of being absent from the boiler-room at the time, and was, it is said, in the office. In order to guard against accident, the firm had taken the precaution to have a steam-gage placed in their private office for their own personal inspection and safety.