Now that we are on the subject of floats, it may be observed that hollow copper vessels have been tried with Mr. Watt's feeder, but the difficulty with these has been, that by frequent expansion and contraction, the parts soldered together have opened so as to cause the vessel to fill with water and sink.

The pumice stone is sometimes objected to, as its gravity is susceptible of variation, by the accumulation of sediment in its pores. As this float, however, is at present used for Watt's feeder, we apprehend that there is not much difficulty in keeping the float clean and well counterpoised.

It is needless to insist upon the importance of a good forcing pump for an engine, with or without a feeder. The manner in which it is proposed to construct the working parts of the feeder exhibited by the drawing, it is believed is such as to create the least possible friction or hinderance to its operations; the amount of friction to be overcome at the spindle on which the float acts, may be readily inferred by a reference to the common throttle and governor valves, the spindles of which are fitted in the same way. Another advantage attending this arrangement, it is presumed, will be, that as the rubbing part of the spindle is constantly covered with packing, no impediment will be so likely to occur from rust.

In the usual construction of Mr. Watt's feeder, the wire that connects the float with the valve, slides up and down through a stuffing box; here, in addition to the pressure of steam that must be contended with, the wire is continually passing from the atmosphere of steam within the boiler, to the common atmosphere without, and liable, therefore, unless properly attended to, to become rusty.

The other parts of the feeder need no further explanation than what has already been given in the communication above referred to, we wish only to repeat, that this contrivance can only feed so long as the pump or engine is in operation; it will, however, be a *tell-tale to the boiler under all circumstances*.

An objection is not unfrequently made to improvements of this kind, on the supposition of their having a tendency to make the engine men careless and inattentive; to this objection it has already been answered, "it is a very mistaken idea, that because steam engines usually move without attention to them, such attention is not required."

All of which is respectfully submitted.

CHARLES POTTS.

Philadelphia, October 27, 1830.

Remarks on the frequent Explosions of Steam Engine Boilers in the United States, and on the construction and operation of two boilers now in use. By D. J. BURR.

TO THE EDITOR OF THE JOURNAL OF THE FRANKLIN INSTITUTE.

SIR,—With much pleasure I see announced the determination of the managers of the Institute, to investigate the causes of explosion of

steam boilers, and, if possible, to devise some adequate remedy or preventative for an evil so alarming. The occasion is the more urgent, as it seems not improbable that competition induces the owners of "low pressure" boats to encroach somewhat on the prerogative of their *more pressing* compeers; and there is so much temptation to progressive improvement in that particular, that we may expect to hear of, if not to experience, the consequences, in more frequent and horrid detail, from year to year.

It cannot but have occurred to every one conversant with this subject, that while in our country, explosions are frequent and dreadful, we hear of no similar catastrophes in Great Britain; and we are led to inquire, what regulations have been adopted and legalized there? and how far may those rules have contributed to this exemption? If on this point it be said that British steamers are universally of low pressure, it should be recollected that our "low pressures" are not exempted from casualty, and that *theirs* are employed almost exclusively in sea water; and a great proportion of them having iron boilers, it might be apprehended that corrosion would be rapid, and the materials would eventually become deficient, and give way.

The same observation, however, applies with equal truth to high pressure steam in Great Britain; and if the inquiry be made why they are exempt from such terrible disasters as occur in this country, not seldom even on land, the answer may probably be, that *their* high pressure is limited to 50 lbs. to the inch, while ours is very commonly three times as great; and as it can hardly be expected that accidents will not sometimes occur, so it must be supposed that as more powerful steam is used, explosions will be more than proportionably frequent and dreadful in their effects.

Provision by law for a strict original survey, and for subsequent frequent proofs, is, perhaps, necessary, and would be most effectual in connexion with such other guards as are obvious, and have often been proposed.

I am aware that what is said above would appear trite if offered to the committee, or to any person well informed on the subject: but this is a matter of public concern, and the public need information. No danger is so alarming as that of which we know not the nature and extent; and it is only by a fair exposition of facts that the general excitement and apprehension can be restrained within rational limits.

But the committee want facts, and on a matter of such great importance, it is hoped that no one will withhold any thing calculated to bear on the questions at issue. In giving my small stock of information, I premise that, although familiar with steam for some years past, I *know* nothing of it as used at 150 lbs., or, indeed, any thing over 50 lbs. to the inch. That it will continue to be used at the highest practicable extreme on our western waters, and wherever freight is a prime object, we need not doubt; but that it will be so employed without ultimate dire disasters from the gradual corrosion and weakening of the boilers, we have no reason to expect. With this impression, however, I cannot but consider the use of such high

steam on land, as of very doubtful expediency, involving a risk but poorly compensated by the economical advantage.

I shall now state some facts to prove that the tremendous explosions now of so frequent occurrence, do result chiefly, if not entirely, from the use of steam of excessive power.

The boiler of a high pressure engine, (not new,) working at a coal mine in this vicinity, is of wrought iron, $\frac{5}{16}$ thick, and supplied with "copperas" water so slightly impregnated, that it is commonly drank by the workmen. After a few weeks from the commencement, it was discovered that the boiler plate immediately over the fire place was cracked and leaking. The steam was limited by the safety valve to 50 lb. the inch, and the engine at full work: the leak continued for several days without material increase, and the boiler was then repaired with a large and good plate, and it was then ascertained that the front end of the boiler being rather lowest, a considerable deposit similar to iron rust was made at the place where the old plate was burned.

In the course of four or five weeks more, it was perceived that a blister was raised on the new plate, and as the engine could not be dispensed with, and the means for repair were not at hand, the protuberance daily increased until it became, as the fireman expressed it, as large and deep as a hat crown. In about ten days it burst, while at full work, and the iron was found to be attenuated to less than $\frac{1}{8}$ of an inch at the thinnest part. The explosion, if such it can be called, was entirely harmless, no one happening to be at the front end, and neither the boiler nor the bricks of the furnace were disturbed.

The boiler was then taken up, repaired, and improved by adding several transverse pipes of cast iron, on a plan similar to the boilers of Woolfe's engines, in Wales. The engine has been running since, about 6 months, and doing well; the pipes being regularly and conveniently cleaned, and there is no appearance of injury, or apprehension of failure.

What remains of my experience as applicable to the inquiry before us, will be best given by a short description of the peculiarities of a small engine attached to the Richmond foundry, which has been used for 12 months past.

The boiler is a cylinder, to which transverse pipes are attached below by short necks, on the plan mentioned above, but on the whole length; these pipes are covered with fire bricks, and the spaces between the necks are closed. The fire acting first below the pipes, returns above them on one side of their necks, and passes off by the other side. This boiler appears to be in some respects peculiarly safe, viz. the cylinder is not likely to be heated dangerously hot, although it should be quite emptied of water. The pipes which are exposed to the most intense heat, are least likely to be empty, and being weakest, would yield first, probably without injury, except immediately in front of the furnace, and experience has indicated a safeguard against this possible danger. On one occasion, by the negligence of the fireman, the water was suffered to exhaust, until

the pipes became empty, and this fact was announced by steam issuing from one end of a pipe where it was found that the pasteboard with which the joint of the cap or cover was made, had become charred or burned by the heat of the pipe, thus giving vent to the steam, and alarm to the fireman. The furnace was cleared, the defected joint repaired, water supplied, and the engine in operation again in ten minutes.

In addition to the usual gauge cocks, and for greater safety, there is attached to this boiler a float with a lever, intended to operate in the mode described in your Journal for July, of an improvement by Mr. Potts, with this difference, that it was arranged to regulate a waste cock, by which surplus water should be returned to the hot cistern. This has not been completed, because it is found that the float is so much agitated, probably by the ebullition from the pipes; that it is considered rather unsafe to rely upon it. For economy of fuel, I consider this boiler equal to any I have known in use; it occupies less ground, and the reports of the performance of Woolfe's engines, at the Cornwall mines, and the long time they have been used, seem good proof of their safety, utility and economy.

Respectfully yours,

D. J. BURR.

Richmond, Va. October 9, 1830.

Reply to the remarks of "A Manufacturer," on an improvement in Piano Fortes, patented by C. P. SAKMEISTER. By the PATENTEE.

TO THE EDITOR OF THE JOURNAL OF THE FRANKLIN INSTITUTE.

SIR,—In the September number of your Journal, I noticed some remarks on C. P. Sakmeister's improved piano forte, said to have been made not insidiously, and charging the said Sakmeister directly with having revived modern antiques. I trust you will be so kind and impartial as to admit this communication in refutation of an anonymous article, assailing my reputation as a mechanic, under the signature of "A Manufacturer," thereby insinuating that as such, he ought to be a judge of what he writes about; but if his pianos, or whatever he may manufacture, are not better than his reasoning, or cannot stand the test of time better than his assertions can of truth and veracity, it will not be impertinent to predict that they will soon be deservedly condemned and forgotten. I should not have condescended to vindicate my reputation against an anonymous, and, I think I may say, a malicious writer, had not the article appeared in your widely circulated Journal.

How far there is even a shadow of truth in *A Manufacturer's* statements, I shall leave the public to judge, after having made a few remarks. It evidently appears *A Manufacturer* is not acquainted with the different piano forte actions, where he says that "the simple catch attached to the key is certainly preferable," and again, "by taking off the top of the action, each key may be taken out." Now, sir, permit me to say, it never has been before successfully attempted