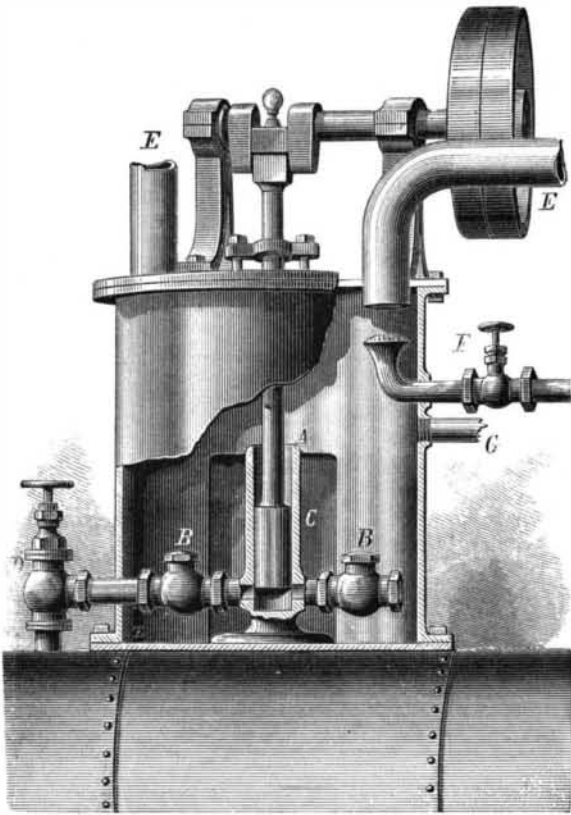


**RICE'S IMPROVED BOILER FEEDER.**

The annexed illustration represents a new boiler feeder in which the pump is placed inside the heater. It is claimed that the feed water is thus warmed to 212 degrees; that there is no loss by radiation, and if the device is placed on top of the boiler or above the water level therein there is no danger of pump or heater freezing up in winter for want of care, as both are self-drained into the boiler. The construction of the apparatus will be readily understood from the engraving.



A is the pump, driven with crank, shaft, and pulley as shown. At B are the check valves, so placed as to be easily removable through the door, C, for repairs. This door is made sufficiently large to admit of the taking out of the entire pump if desired. D is the feed pipe and cock from heater to boiler, and at E E are the exhaust pipes from engine to heater and from the latter to open air. F is the cold water pipe with sprinkler from tank or hydrant, provided as shown with a regulating cock. G is the overflow or waste pipe.

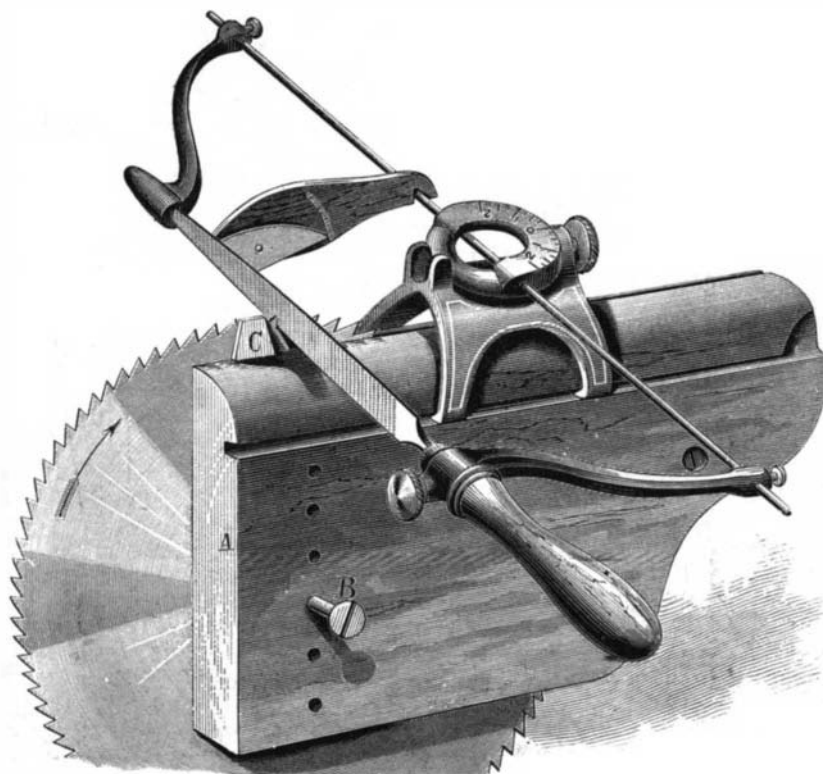
The manufacturer further claims that by this device a freer and drier exhaust is obtained, that it is a good lime extractor, and that it is highly productive of economy in the use of steam. For further information address Mr. D. E. Rice, 191 Atwater street, Detroit, Mich.

**ROTH'S IMPROVED SAW FILE GUIDE.**

The annexed illustration represents Roth's saw file guide which is adapted for filing every description of circular saws, of any diameter, whether having large or small teeth. The ordinary hand file, three cornered, flat oval, or round, is employed, and so operated so that the cutting edges of the teeth will all be of the same bevel and pitch.

A saw once filed may be readily refilled, when necessary, in, it is claimed, the best manner and with the least expenditure of time and power. A table is arranged in connection with the guide, giving such pitches and bevels as have been found by experience to be the best for the different kinds of saw, so that it is only necessary to set the guide to the bevel and pitch as given in the table for each particular type of blade, and the inexperienced workman is enabled to file a saw with ease and accuracy.

The annexed illustration shows the guide arranged for filing circular saws. The saw is adjusted in the clamp, A, and is securely held by the screw, B, which passes through a round washer of the size of the hole in the center of the blade. The saw may thus be easily turned on its center as the teeth are filed at the top of the clamp, and each tooth is given the same pitch and bevel. The gauge, C, serves to keep the saw true. The series of holes shown in the clamp are for the reception of the central screw when securing saws of different sizes. The application of this device to filing hand and all straight saws is illustrated in the *SCIENTIFIC AMERICAN* of January 1, 1876. Two sizes of the invention are made; one for small toothed saws, requiring three-cornered files, and the other for large toothed saws of every kind, necessitating the use of large flat files. The device, we are informed, has been successfully tested by many mechanics. For further information, terms, etc., address the manufacturers, E. Roth & Brother, New Oxford, Adams county, Pennsylvania.

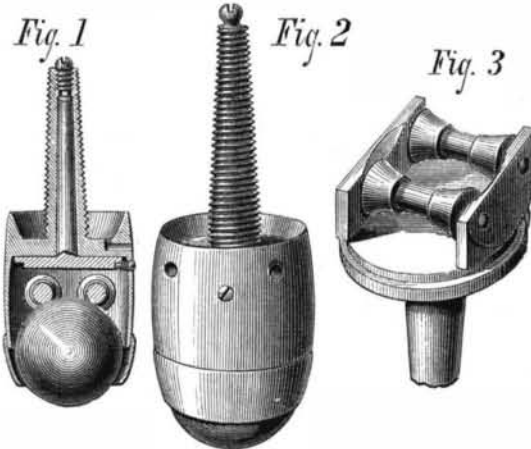
**IMPROVED SAW FILE GUIDE****A New American Science Expedition.**

Professor Alexander Agassiz is starting for Havana with an assistant, there to go on board the Coast Survey steamer *Blake*, which has just sailed on a surveying cruise, that will occupy this winter, in the work of obtaining soundings in the Gulf of Mexico. As this work is conducted, it is made no less useful to terrestrial physics and natural history than to navigation. By a study of the animals dredged from the bottom of the Gulf, Professor Agassiz will be enabled to make important comparisons with the fauna of the Atlantic and especially as to growth, habits, migrations, and changes of living forms found in the waters near the British Islands and the Scandinavian Peninsula. The expedition is under the command of Lieutenant Commander Charles D. Sigsbee.

**KONZ'S IMPROVED FURNITURE CASTER.**

The annexed engravings represent a new friction roller furniture caster, claimed to be strong, durable, and easy in motion.

The upper case or cylinder is cup-shaped above to receive the leg of the piece of furniture. It has a pivot screw which incloses a revolving interior shaft, Fig. 1, which, at its upper end, has a concave hardened bearing to turn against the point of the screw pivot and to receive a little oil. The short interior cylinder which, with its jaws, constitutes the frame for the friction rollers, is shown in Fig. 3. These rollers alone come in contact with the lower supporting ball. A spring ring is placed on the lower portion of the cylinder to hold the ball in place, and a set screw enters a groove in the short interior cylinder, and, while confining the two portions of the caster together allows the lower part to revolve within the upper. Another object of this arrangement is that the friction rollers may automatically adjust themselves, so that their axes shall be parallel with the axis of motion of the ball roller. The small apertures visible on the exterior of the device, in Fig. 2, are designed for the insertion of a suitable wrench to drive the shaft into a piece of furniture and also to enable it to be ascertained, when the bottom of the leg is flat upon the bases.



Patented October 9, 1877. For further information address the patentees, Messrs. S. Konz and P. W. Carle, 244 Greene street, Louisville, Ky.

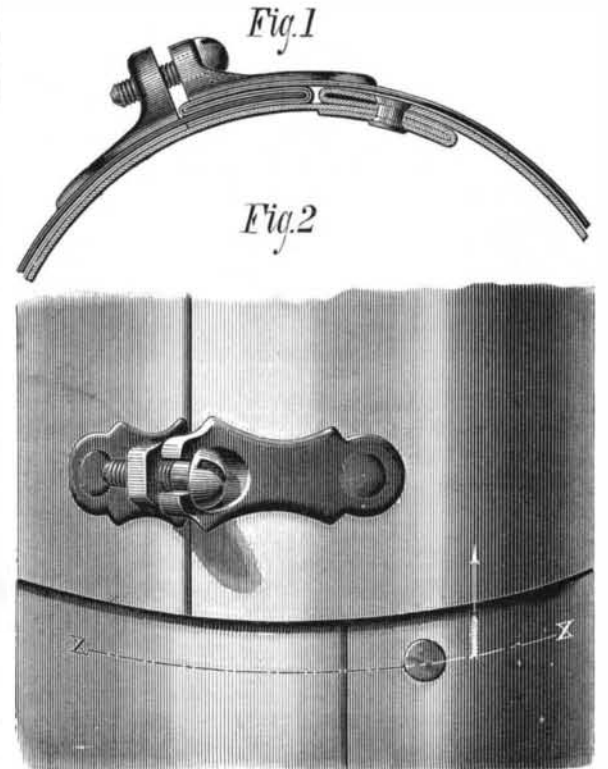
**The Great Virginia Meteor.**

Professor J. L. Campbell, of Washington and Lee University, has been collating and discussing the data for the great meteor which was seen in many parts of Virginia on the afternoon of November 20. He concludes that its height was about 100 miles; but this estimate is merely approximate. Its course seems to have been 8° or 10° west of north. Its

explosion appears to have taken place over the southeast corner of Halifax county, about 15 or 20 miles a little south of west from Clarksville, 100 miles from Richmond, 80 from Lexington, and 55 from Raleigh. It was a meteor of unusual size and brilliancy, and detonated loudly when it exploded.

**DRAPER'S STOVEPIPE JOINT.**

The difficulties experienced in putting up stovepipes are familiar to every housekeeper, and any device that will obviate the annoyance would be a grateful boon to many. We illustrate herewith a simple contrivance which would seem



to be a good improvement, and by its means stovepipe lengths can be put together more readily and more securely, it is claimed by the inventor, than by the old method. It consists in securing the seam of each length at one end by a rivet, as usual, while the edges at the other end are connected by an adjustable joint formed by two lugs, riveted one on each side of the seam and secured together by a set screw. In putting together lengths of pipe, the riveted end of a pipe is slipped into the end of the next pipe, which is secured by the lugs. When the joints are made they can be tightened by screwing up the screw. In this manner a long stretch of piping can be made almost rigid, and each joint is perfectly tight, not only between each length of pipe, but along the seam also, one edge of the rim of the seam being bent to an S, forming a recess, into which the other end fits, as shown in Fig. 2, thereby preventing any escape of gas. One end of the pipe is held rigidly at the same diameter, while the end, secured by the screw clamp, can be contracted or expanded as required.

Patented October 24, 1876. For further information address the inventor, John Draper, Petrolia, Ontario, Canada.

**Rapid Locomotive Building.**

On November 15, in the Michigan Central Railroad shops at Jackson, Mich., two gangs of workmen numbering fourteen men each attempted to put two locomotives together in the shortest time yet made. The *Detroit Free Press* says:

"The jacks were applied, the huge boilers were raised and bolted on their frames, then they were placed on their wheels with all possible expedition, while simultaneously work was progressing on every portion of the machines, which were rapidly assuming perfect form. Water was let into the boilers, and even while men were working at the grates the fires were kindled and the 'infants' began to warm up for their work. At last one of them is ready for the smoke stack, and is pulled along the track until she stops beneath the one designed for her, which hangs above her.

"Lower away, cast off your tackle, go ahead," and the yard engine pulls her out of the house and to another shop for completion, her constructors working as she moves, and busy hands being employed in fastening the bolts which hold the smoke stack in its place. A few moments more and the last screw is turned, the last bolt is fastened, the engineer stands in his place, and in just two hours and fifty-five minutes from the time the signal to commence was given, the throttle is pulled, and the first of the twins moves off completed, followed a moment later by her mate."

All the pieces of machinery connected with the locomotive had been finished and ready for use beforehand, but none had been fitted. On the same day, the two new engines made trips of 76 miles each and worked nicely.