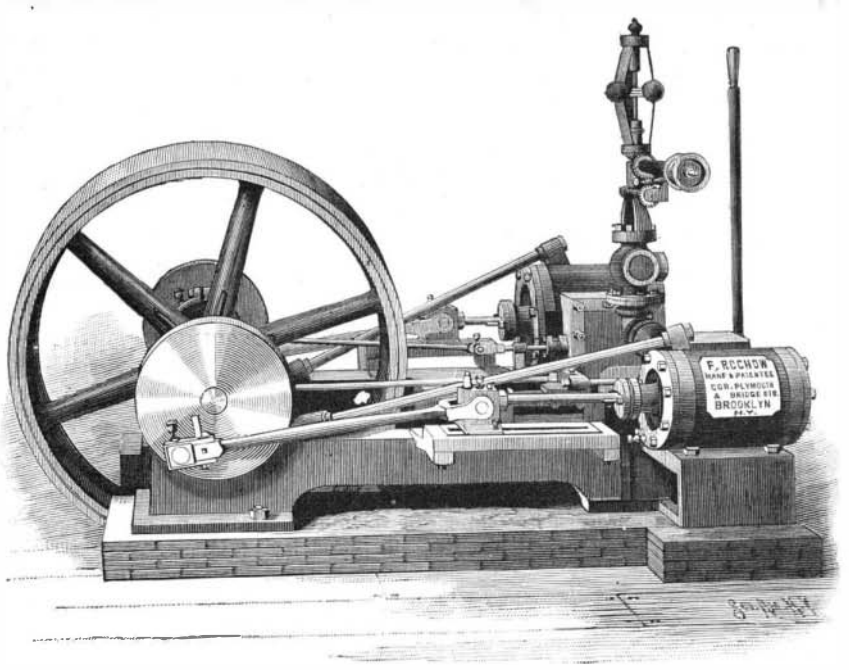
IMPROVED COMPOUND STEAM ENGINE.

The illustration herewith presented shows a compound engine in which the two cylinders are at each end of the crank shaft, the cranks being set at a right angle. This engine is designed so as to use steam expansively, is of the simplest possible construction, and every detail is easily accessible. The stuffing boxes, crossheads, connecting and eccentric rods are all open, and can be inspected at a single glance from any point, and can be adjusted in the shortest possible time, with the commonest engineer's tools. The cylinders are braced to the main pillow blocks, so as to make the whole construction a rigid, self-contained machine. The cranks being at right angles insure a very uniform motion with a comparatively small fly wheel. There is a patented starting valve attached to the engine, which, when used for starting the engine, is thrown over its full stroke. In this position it lets the live steam into the low pressure as well as the high pressure cylinder, and connects both exhausts directly with the atmosphere. After the engine is started up, this valve is thrown back about half its stroke, when it connects the exhaust of the small cylinder with the steam chest of the large one, and the exhaust of the latter with the atmosphere, thus causing the engine to work as a compound. This engine can, therefore, be started positively in any position. All of the parts are made of the best material, the shaft and rods being of superior steel, and all brasses of phosphor-bronze.

While it is a well appreciated fact, and one understood by engineers, that for factory purposes, where the power used is very variable during the day, a well designed single cylinder engine, with an automatic cut-off, a large and heavy fly wheel, and a solid foundation, gives in the long run the best result in economy, still there are often a great many other conditions and requirements that have to be consulted to make a proper selection of the best adapted engine in each case.

Where the power required is substantially uniform, this engine is well adapted—an automatic cut-off being in that case unnecessary; and owing to its compactness and rigidity, it can be used in a small space and where a solid foundation cannot be obtained. Its construction makes it particularly serviceable for all work requiring a constant and unvarying speed, this advantage being secured by the relative position of the cranks and the action of the steam in the two cylinders.

This engine has been patented by Mr. F. Rochow, of Bridge and Plymouth Streets, Brooklyn, N. Y.

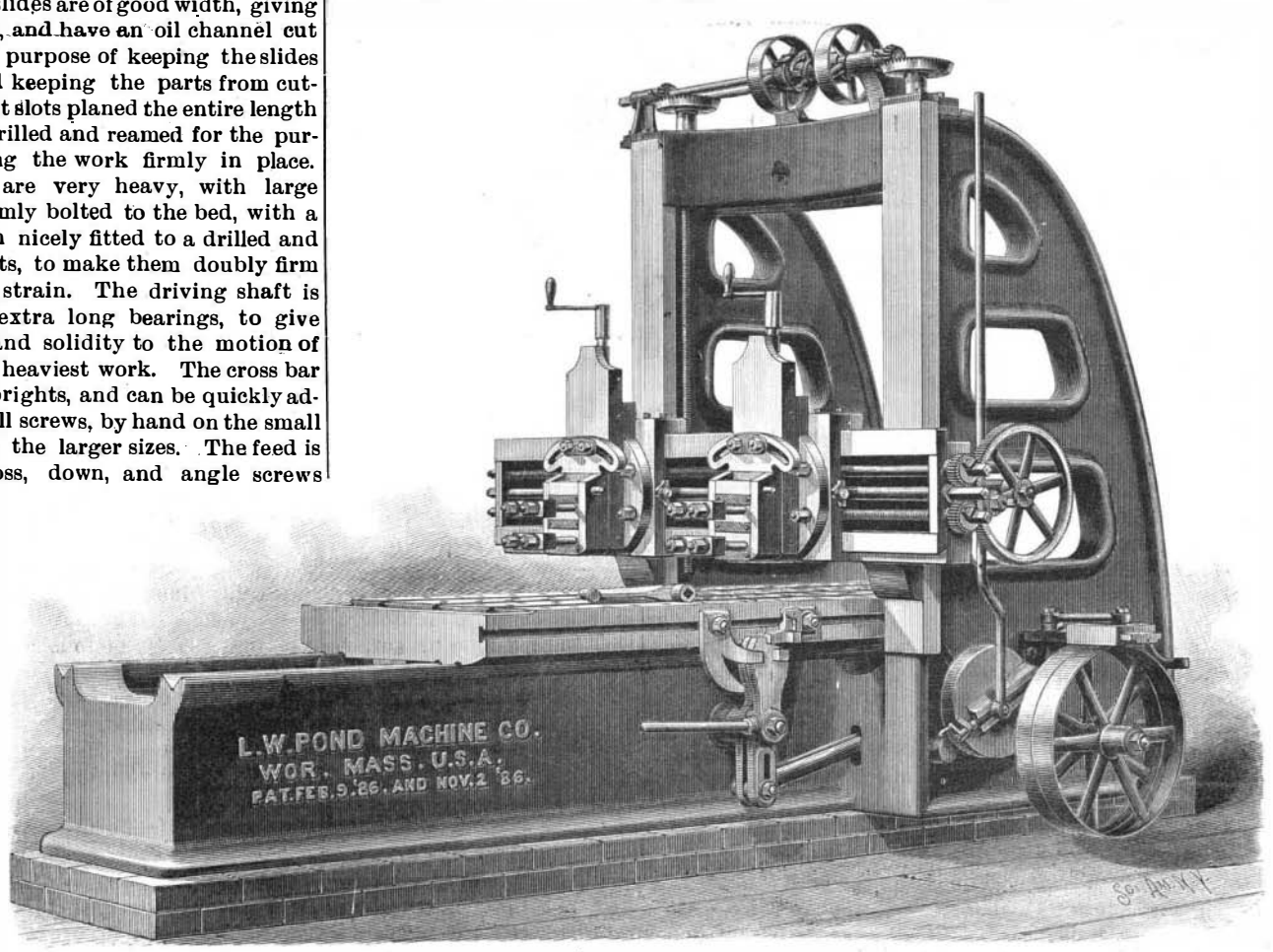


ROCHOW'S IMPROVED COMPOUND STEAM ENGINE.

IMPROVED IRON PLANER.

The accompanying cut represents one of the large size iron planers made by the L. W. Pond Machine Co., of 140 Union Street, Worcester, Mass. The machine is of new design, heavy and strong.

The bed is of unusual length in proportion to the length of the table, leaving but a small part of the table to overhang when planing the extreme length. The table is extra heavy, the slides are of good width, giving an extra wearing surface, and have an oil channel cut the entire length, for the purpose of keeping the slides perfectly lubricated, and keeping the parts from cutting. There are three bolt slots planed the entire length of the table—the holes drilled and reamed for the purpose of packing or holding the work firmly in place. The posts or uprights are very heavy, with large breadth of base and firmly bolted to the bed, with a large additional steel pin nicely fitted to a drilled and reamed hole in both parts, to make them doubly firm against a heavy lateral strain. The driving shaft is made of steel, fitted to extra long bearings, to give steadiness, smoothness, and solidity to the motion of the table when doing its heaviest work. The cross bar is firmly bolted to the uprights, and can be quickly adjusted by the rise and fall screws, by hand on the small sizes and by power on the larger sizes. The feed is transmitted to the cross, down, and angle screws through the driving shaft by a recently patented device, and runs perfectly free and loose after having done its work at the end of the stroke. The reversing motion is of recent invention, covered by patent, and can be easily adjusted to give either belt more or less lead to prevent an unpleasant squealing of the belts when the motion of the machine is reversed, and is entirely under the control of the operator at any part of the stroke.



IMPROVED IRON PLANER.

New Inman Steamer.

The Inman and International Steamship Company, limited, has contracted with Laird Brothers, of Birkenhead, for a transatlantic steamship. She will be built of steel, with triple expansion engines and twin screws, and is to be superior in speed to anything now afloat. Her dimensions will be: Length over all, 500 feet; beam, 62 feet; depth of hold, 43 feet; 17,000 horse power; 8,500 tons register. A feature of the ship will be her longitudinal bulkheads, which, in connection with the usual transverse bulkheads, will greatly increase the number of watertight compartments. Her boilers and engines will be protected by side coal bunkers. Her large passenger capacity, it is intended, will be fitted up for 350 first-class passengers. She will be delivered in the early spring of 1888. The construction of the ship will be followed by that of others, and important improvements in ships of the Inman line now in service.

Settlement of a Great Building.

It seems that the magnificent Palace of Justice at Brussels, one of the most costly structures in Europe, has shown evidences of a settlement which may or may not prove to be serious. The *Wiener Bauindustrie-Zeitung* says that early last fall, during the vacation of the courts, the ceiling of one of the court rooms fell without warning, and another followed almost immediately afterward. There had been evidences previously of injury to the lower portion of the building from the dampness of the ground, but no movement had been noticed. However, a third ceiling soon fell, and cracks began to show themselves in a number of others. The newspapers raised the alarm, and called for an immediate investigation, and the minister of justice appointed experts, who made a thorough examination of the building, and reported that no less than fifty-three ceilings were in danger of falling. They did not attempt to assign a cause for the cracking of the plastering, but contented themselves with taking measures for making the threatened ceiling secure and repairing those that had fallen. There were, however, of course, plenty of amateur explanations of the trouble, most of which accounted for it on the theory that the layers of chalk on which the building rests had been so saturated by the springs which exist in them, that they had yielded under the weight of the building and allowed it to slide down hill, as the Albany capitol is often supposed to be doing. There may be something in this, but it will probably take time to determine whether any action of the sort is really taking place. Meanwhile, there is no need of being in quite such a hurry as one of the Brussels editors, who suggested that, as the building was sure to fall, it might be well to take advantage of the opportunity to raise a little money to go toward the expense of rebuilding, to put on special trains on the government railways to bring strangers to witness the catastrophe. The fall of the tower, particularly, would attract visitors from all parts of the Continent, to say nothing of the English, who would come over in a body to witness the crash.—*Amer. Architect.*

A Perfect Weld without Fire.

A correspondent of the *Blacksmith* writes as follows: "I have never seen anything in the columns of your paper relative to making a perfect weld of steel without fire or borax. A job came to my shop a few days ago in the shape of two pieces of three-quarter inch round steel, welded together end to end. A taper plug of steel was in one end of a shaft on which a corn burr was running The plug of steel was bearing against a like piece of steel in the frame, the object of this being to tighten the burrs. Owing to a loose box on the shaft, the shaft got to jumping, giving a side motion and creating friction enough to weld the two pieces of steel together as stated. The two pieces of steel were hardened."

[It is not a very uncommon thing, adds the *Scientific Press*, for a steel spindle in a spinning mechanism, when running at great speed, as it does in a steel cup, with perhaps a little wabbling, to suddenly stop its motion and become thoroughly welded to the cup. Of course this can occur only when the oil in the cup is exhausted.]

Tenacity of Life in a Pup.

While running a poultry yard in the suburbs of Philadelphia, and a business in the city at the same time, I had but little time for home work before going to business. To my great regret, a litter of mongrel Scotch terrier pups came into the world, which must be got rid of. Early in the morning I took the first one and placed it in a pail of water with another weighted pail on top, and left it until I was through feeding fowls and pigeons, when it was apparently as dead as a pup could be.

Not having much time, I dropped it into a post hole where a fence had been removed. The hole was filled by a forcible use of the boot heel on the sides of the hole, when I left for town and spent the entire day there. On my return home at night, and while passing about the yard, I several times heard the cry of a pup, as I supposed, and at last was attracted to the buried pup by its cries. I secured a spade and dug it out, just as lively as it was before drowning.

JOS. M. WADE.