The building is lighted by 13 windows 5′ by 7′, and the same number 4′ by 6′.

The pattern shop and store room building is 37′ by 115′, two stories in hight. The lower story is 14′ high from floor to ceiling, and is divided, by a partition, into a pattern shop 53′ by 62′ 9″, and a show and packing room 37′ by 53′. Each of these divisions communicates with the yard by a 7′ 6″ doorway, and with the upper story by a 5′ stairway. The upper part of the building is used for a store room for patterns. It is 11′ 6″ high. The whole building is lighted by 58 windows 4′ by 6′. The roof is gable, and is supported by 10 trusses of the ordinary construction.

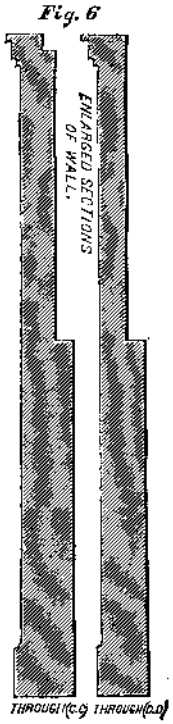
The office building is two stories in hight, and 35′ square outside. It is so placed as to be upon the street, and yet near the machine shops, with which the principal communication is held. The store room for finished work is also convenient. The lower floor contains a general office 16′ 6″ by 32′, through which every one entering the works must pass, and from which all that passes out and in the gateway can be seen. Thus nothing can be taken from the enclosure, or from any of the shops, without being observed from the office. The street exits from the machine shops, as well as the 23′ gateway, are intended to remain closed.

On the lower floor is also the private office, 15′ by 25′ 6″. The second floor is in one room for drafting. It is well lighted by 16 windows 4′ by 6′, and makes an admirable room for the purpose.

With regard to power for driving machinery, a 75-horse horizontal engine is placed in the lower floor of the principal machine shop, having a space of 20′ by 30′ enclosed about it for an engine room.

Power is conveyed from this directly to a main line of shafting which extends through both shops, and is transmitted to a line on the opposite side of the principal machine shop. These lines are clear of the cranes, and may work on to counter shafts for the tools, which should form two rows about 25′ from the front and rear walls.

Fig. 6



This arrangement brings the cranes over the tools, and yet avoids interference with the belts.

Arrangement of minor shafting in the heavy fitting shop is easy.

Power is taken to the smith and boiler shops by a line of shafting running along the wall of the former. Bevel gears are avoided by the use of a perpendicular shaft, with two 3′ pulleys and two quarter turn belts. The same shaft and pulleys may be used with a single belt if preferred. The fan and trip hammers in the smith shop can be driven from this line, and the tools in the boiler shop are properly placed under the shaft, as shown in the plan.

The boilers for this engine are placed 6′ from the shop, and have a fire room which communicates with the engine room and with the yard. Coal is stored under cover in such position that it can be unloaded directly from the cars, and passed into the fire room in small quantities by a shute.

For the work of the pattern shop, and for driving the fan and elevator at the foundry, a 15-horse engine is placed in a separate engine house, 12′ by 24′. The engine is below the level of the gronnd, and the fan belt passes under the surface also. The boiler lies alongside the wall. A line of shafting passes along the lower story of the pattern shop for driving planing machines, saws, lathes, &c.

The boiler of this engine will furnish sufficient steam for heating the pattern shop and foundry. The machine shops and office may be heated by steam pipes from the principal boilers.

The steam for the steam hammer may be carried from the boilers of the large engine, or made in a boiler over the heating furnace.

The yard room of these works is abundant, and accessible from all the shops. The communication between the shops is easy, and the office is so located as to command the whole.

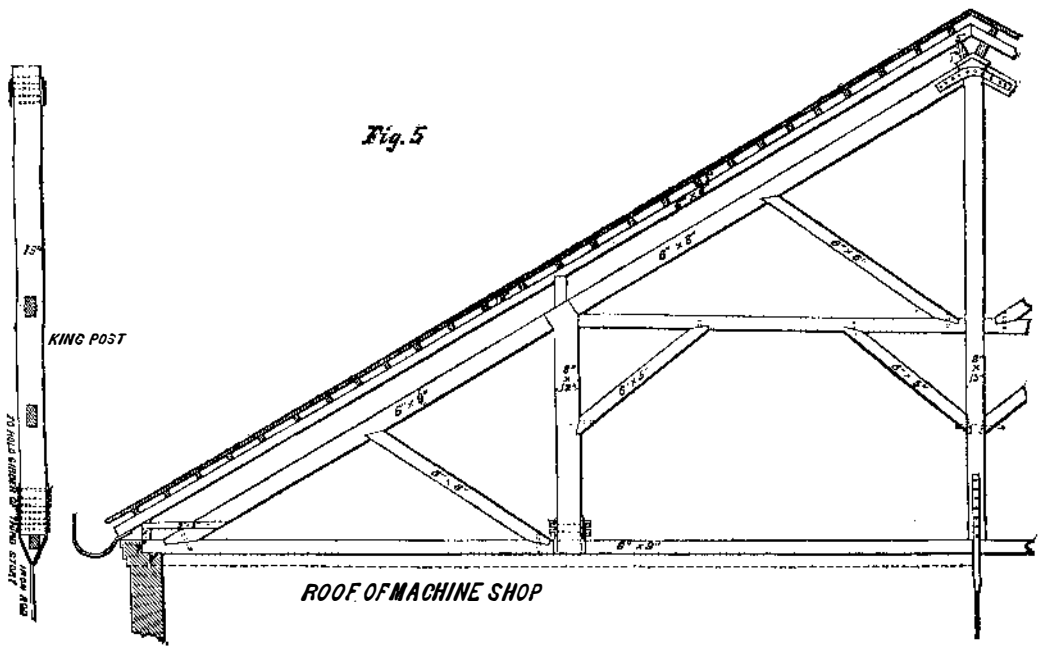
The buildings are substantial, but not expensive. Roofs should be covered with tin or slate.

Foundations depend upon the character of the ground.

The windows have been made with small size glass, as breakage is of necessity frequent.

Another article might be written upon the equipment of these works with suitable machinery. This is a matter of great importance, and should be placed in the hands of a person of experience and good judgment. We may treat this branch of the subject at some future day.

Fig. 5



N. B.—Mr. Wilcox can be found at his office, No. 135 North Third-street, Philadelphia, and is prepared to furnish plans and suggestions to those contemplating erection of shops, &c.

AMERICAN AND ENGLISH OAK.

The people of England have long entertained the notion that the oak grown there is superior to that grown in America for shipbuilding; hence they have not rated American built ships so highly as those constructed of British oak. Donald McKay, of Boston, who is now in the land of Queen Victoria, is endeavoring to enlighten our British cousins on this subject, and to show them how blindfolded they have been to their own interests by the prejudices which they have entertained in favor of their own timber. He states, in a recent letter to the Boston *Commercial Bulletin*, that he "had often heard complaints about the durability of our timber and the rotten state in which our ships are usually found, while a similar complaint is hardly ever made of English ships in America," He gives a very reasonable explanation of this by stating that, as much of the English trade is carried on in American bottoms, especially passenger ships, these have to be surveyed every year—mostly in Liverpool—and thus their defects are discovered and registered; while the absence of a similar law in America, and the little trade carried on with us in English ships, prevents all opportunity of examining their condition in our ports. He says:—"Miserable timber is used in many of the English private yards, and the best proof for this assertion is that most of the gunboats built by the principal firms in England not longer than four or five years ago—and all of the choicest English oak—have heen found, on survey this summer, to be in a most frightful state of rottenness. The excuse made for this is that these vessels had been built of unseasoned timber. Now, all our merchant ships and steamers are built of unseasoned, and even quite green timber; but there is, to my recollection, no instance of such wholesale rottenness in our merchant ships on record. There is no doubt that good English oak is a most excellent material for shipbuilding; butfrom what I have seen, heard and read about it, I have no hesitation in stating that its qualities have been exaggerated to the damage of other (in no ways inferior) timber. Prejudice is a difficult thing to overcome in this country; but the durability of our well-built clipper and packet ships running for years and years under the most trying circumstances, without evincing any sign of weakness or rot, is a fact that even the most prejudiced Englishman cannot erase from the book of experienee. The great difficulty in the regulation of our ships arises from the fact that they are thrown into the same category with the Canada ships; as the latter are known to rot very fast, it cannot be nnderstood here why it should be otherwise with our ships, which are also built in North America. We might as well say that English ships cannot be durable because Russian ships are known to rot very fast, and England and Russia belong to Europe. I yet once more express my opinion that our white oak timber growing southward of New Hampshire takes rank among the very choicest and fittest timber for ships building, and that no other material is known to be superior to it."

MELTING ZINC BY GAS.

We translate the following article from the *Journal de L'Eclairage au Gaz*, published at Parls:—

"The melting of zinc, which is generally performed in plumbago crucibles over a coke fire, requires an elevated temperature that is difficult to regulate. If the temperature becomes too high, it causes a loss of zinc by evaporation and burning, and it also seriously injures the quality of that which remains; the oxyd of zinc resulting from combustion mixing mechanically among the metallic mass and producing what is called burnt zinc. This accident occurring daily in zinc foundries, aroused the attention of Mr. Miroy to the advantages of employing gas in this operation. His apparatus consists of a cast iron crucible placed upon an upright cylinder in a conical furnace, where the gas is burned. This furnace is formed of two concentric envelopes of iron plates, separated by a layer of sand; or it may be made of fire brick. The gas is brought in obliquely from the two sides by two pipes, each concentric to a larger pipe, leading compressed air; the gas pipes being 6-10ths of an inch in diameter, and the air pipes 2 8-10 inches. Mr. Miroy estimates that the volume of air employed should be triple that of the gas, and this proportion is regulated by stopcocks in the pipes. The air is forced into the pipes by a blower driven by power. The melting by gas is more rapid and less costly than the fusion by coke, especially when a crucible has to be mounted for a single melting. There is also a great saving in the cost of crucibles.

APPLICATION FOR THE EXTENSION OF A PATENT.

Harvesters.—Andrew J. Cook, of Enon, Ohio, has applied for the extension of a patent granted to him on the 20th of November, 1846, for an improvement in the above-named class of inventions. The testimony will close on the 22d of October next; and the petition will be heard at the Patent Office on the 5th of November, 1860.