Concrete vs. Brick Floors.

The designer of a certain warehouse in Germany, unable to find definite data of the resistance of such floors, resolved to make trials for his own information, and incidentally for that of his professional brethren. The warehouse was of immense size, covering nearly an acre of ground, and was intended for the storage, among other things, of heavy pieces of metal, the handling of which often involved considerable shocks to the floors. The whole building was fireproof, part of the flooring being of brick arches in cement, between iron beams, and part of concrete slabs supported in the same way. Five trial floor arches were built, each 44 inches in span, of which the first consisted of concrete, made with one part Portland cement to five parts of gravel, while the second was of hard bricks in Portland cement mixed with three parts of sand, and was covered with a coat of asphalt three-quarters of an inch thick; the third was of softer brick, in mortar containing one-half as much lime as cement, and four parts sand; the fourth was of the same brick, in equal parts of lime and cement, and five parts sand; and the fifth was of the same brick, in cement alone, mixed with four parts sand. These last floors were finished with a coat of cement, three-quarters of an inch thick or more.

Fifty-four days after their completion, each floor was loaded with pig iron to the amount of 200 pounds to the square foot. This weight had no effect, and two days later the concrete arch was tested by letting fall upon it an iron ball of 60 pounds weight. This, dropped from a height of five feet, did no harm, and another ball, of 135 pounds weight, was let fall from the same height. The first blow produced no effect, but by dropping the ball repeatedly on the same spot a crack was started at the fourth blow, and the eighth broke a hole entirely through the floor, the opening being 4 inches in diameter at the top and 24 inches at the under side.

Thirty days later the same test was applied to another part of the floor, and a hole of the same size and shape was broken through at the ninth blow of the ball. The thickness of the concrete in the middle of the span was 4 inches. Trials were made of the brick floors in the same way. The first, of hard brick in strong cement mortar, stood forty-eight blows of the heavy ball before it was pierced; the second, of softer brick, with lime added to the mortar, gave way at the tenth blow; the third, at the seventh blow; and the last, of soft brick in sandy cement mortar, without lime, at the tenth. In all these cases the hole broken through was much larger at the intrados than at the extrados. A new floor was then built of soft brick, in mortar made with two parts lime to three of cement and ten of sand, and covered with a layer of concrete, of equal parts of cement and sand, 2 inches thick. After this had set, the floor required seventy-one blows of the 135 pound weight to break it through. This protective effect of the thick layer of concrete over bricks is very curious, but aside from this, the result of the tests was decidedly in favor of the brick arching.—*American Architect.*

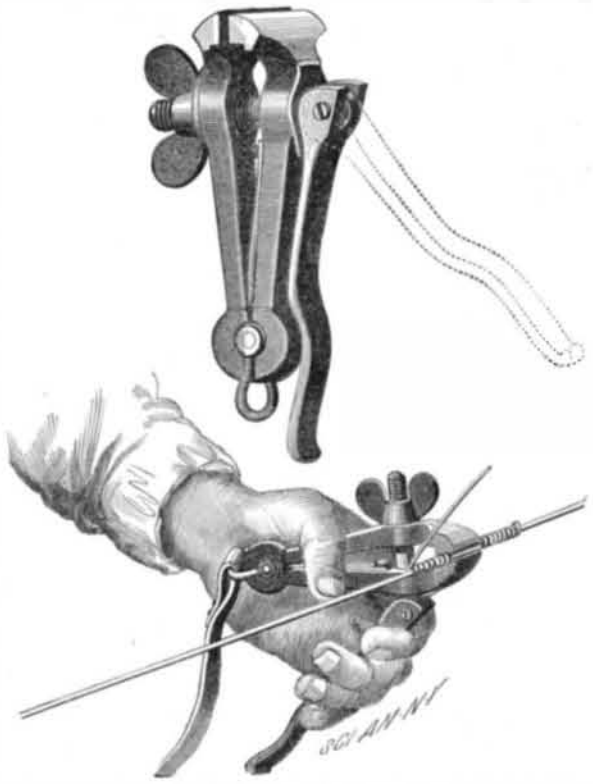
Exemption of a Physician's Property from Debt.

A New Hampshire physician was unfortunate enough to fall into debt and have judgments entered against him. The creditors naturally tried to obtain payment by issuing execution, and among the articles levied on by the sheriff were the physician's wagon and harness. The New Hampshire law says that such articles as are "tools of a person's occupation" cannot be seized and sold under an execution. The physician maintained that his wagon and harness came under this designation, and tried to recover them from the sheriff. The court, in deciding the question, which is an important one, does not settle the particular case, but refers it to a jury. The legal principles involved are of interest, and we quote from the decision as follows:

"The court cannot say, as a matter of law, that a wagon or a harness is a tool of a physician's calling, and so exempt to all physicians; nor can they say that it is not such a tool. The most that can be said, as a matter of law, is that it may be a tool of his profession if, in the particular case, it is reasonably necessary for him to use it as a tool. If it should appear that his practice was confined to his office, or that he was a physician or surgeon in a hospital, attending to no cases outside of the institution, or that he was a surgeon on shipboard, or that he went on foot or horseback, or on the cars, to visit his patients, a wagon and harness would not be exempt under our statute, because they would be of no use to him as tools in his practice. They might be of use to him in other respects, as in going to church, or in carrying his children to school, or in visiting friends, or as a means of recreation and pleasure; but these uses are manifestly not within the legitimate scope of the technical duty of a physician. Not coming within the strict definition of the term tools, and not being reasonably necessary as tools for him in his practice of his profession, they would not be tools within the meaning of the statute, and so would not be exempt as such. But if it should be found that the physician claiming the exemption could not practice his profession with reasonable success without a team with which to visit his patients; that he was located in a country town, for example, where it was necessary for him to ride a large part of the time in order to accomplish anything professionally, a wagon and harness might properly be found to be reasonably necessary for him as tools of his occupation. But the finding would be one of fact, so far as the reasonableness of the use is concerned; and it could not be said that these articles are exempt to every physician, or to physicians generally, but only to the debtor in the particular case. If there is any doubt whether an article claimed to be exempt from attachment is a tool under the statute, the question should be submitted to the jury whether its use as a tool by the debtor in his business is reasonably necessary. If it is, it is exempt; otherwise, it is not exempt."

IMPROVED VISE.

The object of an invention recently patented by Mr. William M. Whiting, of Elizabeth, N. J., is to construct a vise for grasping and securely holding articles of various sizes in such a manner that the pressure exerted by the pivoted jaws may be increased at will by a device acting independently of the screw and nut usually employed for forcing them together. The jaws of the vise are of the usual form. A screw threaded bolt extends through holes in the jaws, and at one end is pivoted to a cam lever, which also serves as a head for the bolt and prevents it from passing through the hole. A nut turns upon the thread of the bolt projecting



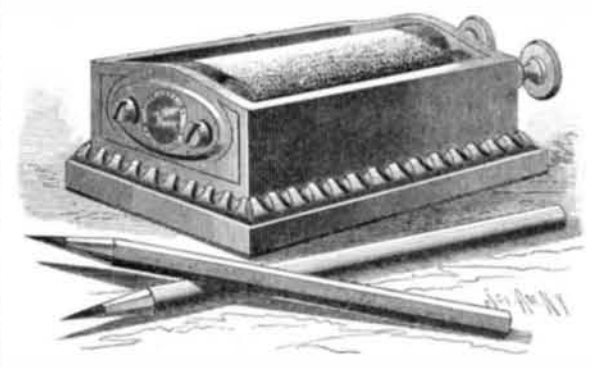
WHITING'S IMPROVED VISE.

from the opposite side of the vise. By means of this nut the jaws may be forced together, but where a greater pressure is desired than can be obtained in this way, the cam lever is raised so that the narrowest portion of its eccentric is interposed between the jaw and pivot of the lever.

After the jaws have been brought sufficiently together by the nut, the final pressure for grasping the object is obtained by forcing the lever downward, when it may be conveniently held by grasping it in the hand, together with the lower portion of the vise. This vise is designed with especial reference to the requirements of telegraph line men, and is of great value in working upon several articles of the same size, for in such case it can be set, by means of the screw, so as to allow the object to be readily placed between the jaws, after which the grasping pressure may be instantly secured by a single movement of the cam lever.

COMBINED PAPER WEIGHT AND PENCIL SHARPENER.

A small article which artists and draughtsmen will find particularly useful has been recently brought out by Messrs. Keuffel & Esser, of 127 Fulton Street, New York city. In a cast metal coverless box are journaled, longitudinally, two rollers, the axles of which are extended through the case at one end and provided with buttons by means of which they may be turned. Each roller is formed with a longitudinal slot just wide enough to admit the edge of a piece of fine sand or emery paper, which is of such a length



COMBINED PAPER WEIGHT AND PENCIL SHARPENER.

as to admit of its being wound several times around the rollers. The paper passes over a bar placed across the top of the box parallel to and between the rollers, and thus presents a wide surface upon which the pencil may be conveniently sharpened. When the exposed part of the paper becomes worn, a clean portion may be brought up by simply turning one of the rollers. All the dirt is collected at the bottom of the box. The device also forms a very handy paper weight.

DECISIONS RELATING TO PATENTS.

United States Circuit Court.—Northern District of Illinois.

THE BROWN MANUFACTURING COMPANY *vs.* DEERE & CO.

Blodgett, J.:

The first claim of letters patent No. 190,816, granted to William P. Brown, May 15, 1877, for an improvement in couplings for cultivators, examined, sustained, and the defendant held to infringe.

The phrase in the claim "against or with the weight of the rear cultivators or plows" should not be read, as defendant contends, "against and with the weight," etc. There is no uncertainty or ambiguity in this claim. The claim is comprehensive enough to cover both the arm, M (by which a spring power is applied), and the arm, M′ (by which the draught power can be applied), for the purposes to which the inventor proposed to apply them.

The objection that the specification describes and the claim covers a useless form or construction, as well as a useful one, is of no avail where the infringer uses the latter. The well known maxim applies, "*Utile per inutile non vitiatur*"—that which is serviceable is not to be rendered invalid by that which is useless.

Transferring the point of applying the lifting force of a spring from a point behind the forward end of the beam to an arm on the coupling, to which the beam is pivoted, *held* to involve patentable invention.

The fact that not only the defendants in this case, but other large manufacturers of cultivators, have at once adopted substantially the same auxiliary lifting devices shown in complainant's patent is evidence of the popular acceptance of this as a practical solution of many of the difficulties which had been encountered in the attempt to use the older devices, and is such a change and improvement as required more than mere mechanical skill, and brings this device fairly within the domain of the patent laws.

The fact that these older devices—Stover of 1870 and Brown of 1872—which it is now claimed were susceptible of being modified by mere mechanical skill into a machine in its operation and effect like that shown by the complainant's patent, rested without any such modification until the present patent was promulgated, held to be quite conclusive proof that it required something more than mechanical skill to produce what is shown in this patent.

United States Circuit Court.—Southern District of New York.

HOLMES ELECTRIC PROTECTIVE COMPANY *vs.* METROPOLITAN BURGLAR ALARM COMPANY.

Wheeler, J.:

Patent No. 120,874, granted to Edwin Holmes and Henry C. Roome, November 14, 1871, construed to be for an electrical covering fitting the outside of safes, as distinguished from an electrical protection applied to houses and other buildings and to rooms. The patent sustained, and a preliminary injunction granted.

The provision of the statutes that a United States patent for an invention previously patented abroad shall be so limited as to expire at the same time with the foreign patent seems to mean that the term of the patent here shall be as long as the remainder of the term for which the patent was granted there, without reference to incidents occurring after the grant. It refers to fixing the term, not to keeping the foreign patent in force.

Rifle Caliber Machine Guns.

Lieut. Sleeman, in an article in the *N. A. Review* for October upon the development of machine guns, says:

The use of rifle caliber machine guns offers to a general the simplest and most effective means whereby to intensify rifle fire at any point of his position, without causing the offensive or defensive power of any other part to be weakened for this purpose.

Rapid firing single barreled shell guns possess some exceedingly important features for the military service, whether used in the field, as mountain guns, or for the armament of fortifications and earthworks. The properties that most strongly recommend these guns for service in the field are rapid fire, little or no recoil of gun carriage, mobility, simplicity of mechanism and manipulation, and, lastly, the use of made-up or self-contained cartridges. It is difficult to conceive of more suitable guns for light horse artillery. Take, for instance, a battery of six rapid firing three-pounder shell guns, each capable of discharging eight projectiles in half a minute, with deliberate aim between each shot. A battery of this nature could in this short period of time deliver forty-eight projectiles, equivalent to 144 pounds of metal, and if common shells were used, with 1,440 splinters, or for shrapnel shells, with 2,016 lead bullets. Such a rain of bursting shells would create terrible confusion, and have a most demoralizing and destructive effect, if thrown among a body of troops, while if directed against earthworks or houses, the continuous fire of shell after shell would soon produce considerable damage. The comparative lightness of these weapons would permit of their being provided with an effective shield protection without reducing to any serious extent their property of mobility; besides, the additional weight of this shield would permit of a larger powder charge being used, with a corresponding increase in initial velocity, accuracy, and power. Three-pounder guns have been referred to, but six-pounders are also adapted for field service, by allowing them to recoil and automatically return to their original positions without causing their carriages to run back.