DECISIONS RELATING TO PATENTS.

U. S. Circuit Court.—Northern District of New York.

THE ALABASTINE COMPANY *vs.* PAYNE.

Motion to dissolve injunction.

Coxe, J.:

The complainant is the owner of Letters Patent No. 161,591, granted to Melvin B. Church, April 6, 1875, for an improvement in calcimine.

The inventor in the specification says:

I take of pulverized calcined gypsum nine pounds and of white glue one pound, the glue having been previously dissolved in hot water. When this glue, thus dissolved, is cold, I stir it into the gypsum in any suitable vessel, adding thereto from time to time sufficient cold water, until the mixture has the consistency of mixed paint for priming coats, when it may be laid on the wall with a brush, where it sets slowly, affording a hard, dead smooth surface that will not rub off, and is much cheaper than the calcimine which has whiting or zinc for the body.

The claim is for—

A calcimining compound adapted to be used with brushes, composed of pulverized calcined gypsum, dissolved glue, and cold water, substantially as described.

It is conceded by the defendant that this patent is valid, or, to be more accurate, that he is not in a position to deny its validity. The question of infringement therefore is alone involved.

The defendant has sold to consumers in this district a compound known as "anti-kalsomine," composed of pulverized calcined gypsum and white glue, manufactured and sold to him by a company located at Grand Rapids, Michigan, of which Melvin B. Church, the patentee, is president, general manager, and prime mover. Church was for years, as superintendent of the complainant corporation, engaged in manufacturing and selling a compound known as "alabastine," which he then insisted and publicly proclaimed was protected by the patent in controversy. Having disposed of his patent to the complainant and severed all connection with his former associates, Church is now, through the medium of the new corporation, engaged, to the great injury of the complainant's business, in selling anti-kalsomine, a compound almost exactly identical with alabastine.

The question to be determined is whether, keeping in view the past relations of these parties, the plea of non-infringement should now be accepted by the court.

It is contended that one who sells a dry mixture of pulverized calcined gypsum and glue, even though he subsequently reduces it to a liquid condition by the addition of hot water first and cold water afterward, does not practice the invention.

The defendant sells the gypsum and glue put up in packages, upon which are printed directions, to which it is unnecessary to refer in detail, further than to to say that, *mutatis mutandis*, they follow quite closely the formula of the patent. The liquid thus produced ready for use upon the wall is almost the exact counterpart of that described and claimed in the patent. With this product alone before him it would be a difficult task, even for an expert, to say how it was produced—whether the former or the latter directions were followed.

In selling a compound which he knows cannot be practically applied without making the user a trespasser, the defendant, within the doctrine of the following authorities, renders himself an accessory to the infringement: The Rumford Chemical Works *vs.* Hecker, 2 B. & A., 351, 363; Cotton Tie Co. *vs.* Simmons, 106 U. S., 89, 94, 95; Tilghman *vs.* Proctor, 102 U. S., 707, 728; Goodyear *vs.* Railroad, 2 Wall., Jr., 356, 359; Wallace *vs.* Holmes, 9 Blatchf., 65; Woodward *vs.* Morrison, 1 Holmes, 125; Bowker *vs.* Dows, 3 B. & A., 518; Travers *vs.* Beyer, 26 Fed. Rep., 450.

Parties should not be permitted to evade the law by such proceedings as these papers disclosed. It is the clear duty of the court to arrest the wrong in its inception.

The motion to dissolve the injunction is denied.

Railway Brakes.

The following is from the recent report of the Committee on Driving Wheel Brakes, read at the recent convention of the Railway Master Mechanics' Association, Boston, Mass. A thorough and satisfactory discussion of the value and suitability of any of the mechanical appliances for securing brake power is possible only after a clear conception is obtained of the nature of frictional resistances as shown by experiment; and the most important point to be borne in mind is the difference in the character of sliding and rolling friction.

Sliding friction (that of all shafting and axles in their journal boxes, and cross heads on slide bars) is a varying but always large and measurable quantity, comparatively low in amount as velocity diminishes.

In the rolling of a cylinder on a plane, even if the surfaces are not as perfect as those usually provided for sliding, the frictional resistance resulting is very small, and the relative motion is not that of one surface rubbing past another, so that it is quite proper to say that at the actual point of contact between circle and line these extremely limited surfaces are for the moment at rest with reference to each other, or to say they are moving at equal and similar speeds.

Hence, the positive resistance of motion, due to the contact of wheel with rail, may for our purpose at least be considered *nil*, as long as ordinary conditions prevail. But the primary object in the application of brake resistance is to disturb these ordinary conditions, so that the touch of wheel on rail, instead of being a rolling and therefore almost frictionless contact, shall become that of sliding or rubbing at very low velocity, thus securing the highest coefficient of frictional resistance possible between two given metallic surfaces moving on each other, and achieving the final result of bringing the train to rest in the shortest time and distance.

For with engine and train in motion, all that we can do to bring it to rest is to create additional friction; and that of the brake block on the tire is only a means to an intermediate, most necessary, but (as our Patent Office shows) not self-evident end, viz., the creation of friction between rail and wheel, the two surfaces that are in rolling (or equal speed) contact, but that must be put into slow sliding contact; for, although the sliding friction of block on tire will soon destroy the centrifugal motion of wheel and axle, centrifugal force forms but a small fraction of the momentum tending to keep the mass in rapid horizontal movement.

We need not go to the mathematical labor of getting the square of the center of gyration of a hollow spoke cast wheel (which would be necessary for any close comparison), but it can safely be said that in the worst case the centrifugal power in the wheels (tending by their rotative contact with rail to keep the train in motion) is, at any speed, but from 5 to 7 per cent of the total momentum or power requiring to be neutralized by the opposing brake; the remainder of the brake force, if properly employed, is used in producing sliding at low velocity, or destroying rolling contact between tire and rail, this being its main and legitimate duty. Therefore, any force or mechanical combination, other than the application of brake blocks, may be used if it will result in producing this difference in touch between tire and rail; as our object is to change the contact from rolling to sliding, yet at the same time keep the sliding velocity exceedingly low, because the lower the sliding speed the greater the frictional resistance. It is now self-evident why we endeavor to avoid skidding the wheels; as, when that is done, although tire is certainly sliding upon rail, the velocity of this sliding is high and the coefficient of friction correspondingly low, and the resistance to neutralize the momentum of the train is low.

Thus the locking of the wheels, although it looks so effective in the eyes of a green employe, and has often been the object aimed at by quite as verdant a patentee, is a gross mistake; in effect not only injuring rail and tire, but absolutely lessening the frictional resistance between them, which is all we have to depend upon. The maximum is attained when the wheel is revolving with a peripheral speed almost but not quite equal to that of the train, and no further resistance to motion with the modern train equipment is possible. Our object, then, in the application of brakes is to attain just this slight difference in the nature of the touch between tire and rail; more we cannot get, and less is a defect.

The answer to the committee's query, "Should brakes be applied to the wheels of all engines?" show an overwhelming majority in favor of the application of brakes on all engines. Mr. Lockwood lent us the official Board of Trade returns for 1884, showing in Great Britain a total of 4,177 locomotives so equipped.

On the general question as to the coupling up of the brake gear throughout the whole train, its automatic action on drivers, or whether it is advisable to allow a conductor to apply brakes on drivers, opinions vary much; but there is a general feeling in favor of enginemen having the opportunity to apply the whole brake power, restricting the application by conductors to cars or a car and tender only; that is, no one in rear should have the opportunity of applying brakes on driver while the engine is under steam.

"Is there any danger in using a powerful brake at front end only?"

It is satisfactory to find not a single case of trouble due to the application of drive brake only is recorded in the answers received, while 18 state definitely that in their opinion there is no danger.

What percentage of the total weight of the engine can effectively and safely be utilized for brake resistance? If there is no risk or danger in locating a powerful resistance forward of the moving body, no attention to this question is necessary, unless the brake is automatic in application when the train separates. In considering this latter case, it should be remembered that it is not judicious in arranging the lever proportions for any cars to count upon utilizing more than the tare or empty weight; otherwise, if arranged to take advantage of the increased weight when more or less loaded, then, if brake blocks be applied to wheels when car is actually empty, the effect would be to promptly skid them. Hence, if the engine brake is designed to utilize the whole of the weight of engine and tender, and the detached cars in rear be heavily loaded, the latter will, after the brakes have gone on automatically, move with a higher speed than the front end, and eventually collide. Such a rear pitch-in could only take place when the brakes on engine and front cars utilized for resistance to motion a greater percentage of the total dead weight resting on the braked wheels than was utilized on the rear portion. Some engines have blocks on all wheels, and tank engines lend themselves readily to such arrangement; but care should be taken to arrange the leverage so as not to utilize the whole insistent weight, if the application is to be automatic.

To the somewhat crude question of What percentage of weight on drivers should be utilized? one reply says from 7 to 10 per cent; another, 45 per cent on engine and tender, with 100 per cent on cars; a third, 50 to 60 per cent; a fourth, 80 per cent; a fifth, 75 to 90 per cent; a sixth, 95 per cent; and a seventh, say twice the weight on drivers, or 200 per cent. Captain Galton's experiments—which are now classic—prove that speed is the most important factor in this equation, 200 per cent being safely used at high speed of 50 or 60 miles per hour without skidding the wheels, but the pressure must be lessened as the speed lessens if skidding is to be avoided.

BRAKE SHOES.

In the matter of brake-block shoes, their substance, size, and shape, six are in favor of cast iron, seven of wrought iron, and the American Company say 95 per cent are of wrought iron. Mr. Webb says: "The best results we obtain from wood blocks when they can be conveniently applied. Those we have in ordinary use are of English poplar, about 18 by 3½ in.; the face is perforated with fine 1¼ in. holes, which are afterward filled with a mixture of resin and sand;" and Mr. Johann, while preferring wrought iron, has obtained excellent results from a head filled with hard wood blocks. The Eames Company say that material is to be preferred which yields the quickest stop, with due regard to economy, durability, and effect upon the wheels. Cast iron presents a greater frictional resistance than wrought iron, much as it granulates and retains a certain degree of roughness throughout all life of the shoe, instead of becoming smooth and polished, as the case with wrought iron.

The wear upon the tires is undoubtedly greater with the cast iron than with wrought iron, but this is the necessary result of its greater braking efficiency. The more effective the brake, the greater the wear of both shoe and tire. The same principle of efficiency applies to the comparative cost of the two materials. The wrought iron shoe has a longer life, and, independent of the work performed; is cheaper, but when the actual braking power furnished by each is taken into account, cast iron is the most economical.

As to amount of surface, the American Company averages 60 sup. in.; two replies give a maximum of 88 in. and one a minimum of 36 in., or a difference in length varying from 22 in. to 9 in. The Eames Company say they favor the greatest length of shoe that can be conveniently applied. The longer the shoe, the less frequent the replacement; the frictional resistance being the same whatever the length of the shoe, the greater the surface of the shoe, the greater the distribution of the wear and consequent life of the shoe. The same principle applies also to the thickness of the shoe, the thicker the greater the durability. As a matter of practice, having regard to all these points, we make our shoes of a length equal to three-fourths of the radius of the wheel. Our experience is opposed to the use of channeled shoes, because of their liability to cut into the tire. But it is an advantage to have shoes fixed well over the flanges, and five replies indorse this latter statement.

New Fire Damp Indicator.

At a recent meeting of the Physical Society, London, the following, by Messrs. Walter Emmott and William Ackroyd, was read: The Royal Commission on Accidents in Mines point out in their recently issued report, as a serious objection to the use of the electric light in mines, notwithstanding its many great advantages, that the light of an incandescent lamp, being produced within a vacuum, cannot admit of any device for the indication of firedamp, such as is given by the Davy, for example. The present apparatus is the outcome of an attempt to overcome this difficulty. It consists of two incandescent lamps, one with colorless and the other with red glass, and the circuit is so arranged that in an ordinary atmosphere the colorless lamp alone shines, but in firedamp this goes out and the red one is illuminated. This is effected in a simple manner by the motion of a mercury contact occupying the lower part of a curved tube, one end of which is open and the other connected with a porous pot of unglazed porcelain, the motion of the mercury being due to the increased pressure in the porous pot occasioned by diffusion.