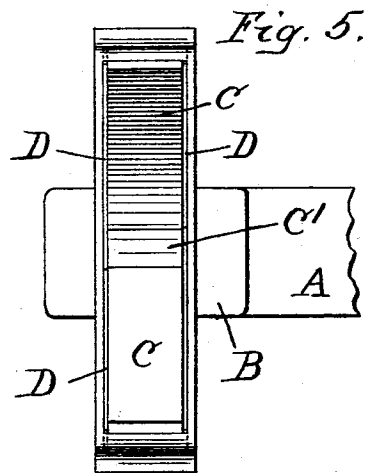
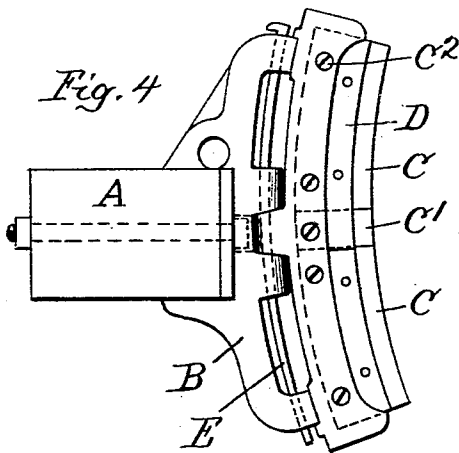
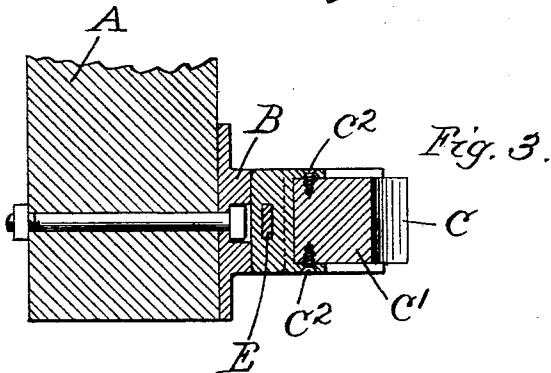
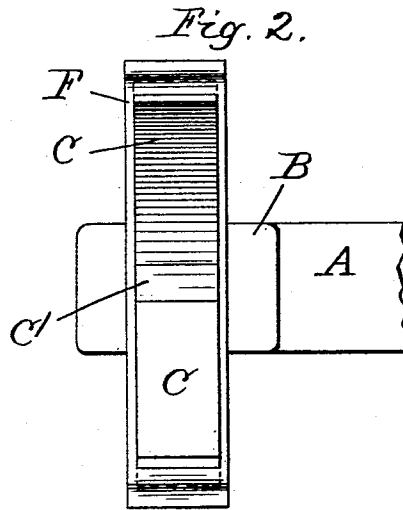
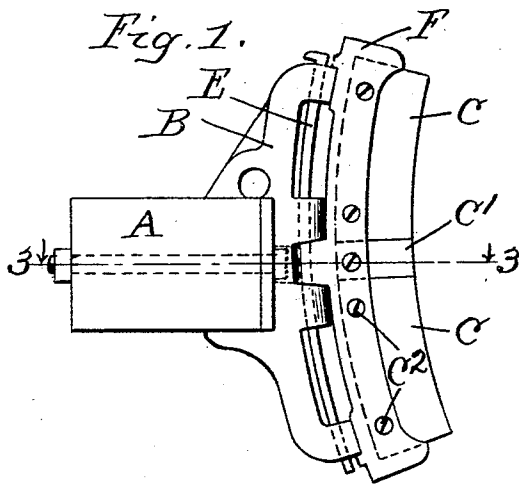


(No Model.)

J. McLACHLAN.
BRAKE SHOE.

No. 573,523.

Patented Dec. 22, 1896.



Witnesses.

E. T. Wray.

Donald M. Carter.

Inventor.
John McLachlan
by Francis W. Parker,
his Atty.

UNITED STATES PATENT OFFICE.

JOHN McLACHLAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO FRANK P. STONE, OF SAME PLACE.

BRAKE-SHOE.

SPECIFICATION forming part of Letters Patent No. 573,523, dated December 22, 1896.

Application filed August 15, 1896. Serial No. 602,893. (No model.)

To all whom it may concern:

Be it known that I, JOHN McLACHLAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Brake-Shoes, of which the following is a specification.

My invention relates to brakes, particularly to such as are employed on railway-trains and the like, and has for its object particularly to provide a new and improved brake-shoe to be used in connection with such brakes, and which, among other advantages, will have greater frictional power than the ordinary metallic brake-shoe, and which also will have greater durability than the ordinary fibrous brake-shoe.

My invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a side view of a brake embodying my invention. Fig. 2 is a front or face view of the same. Fig. 3 is a section on line 3 3, Fig. 1. Fig. 4 is a side elevation of a modification. Fig. 5 is a face view of Fig. 4.

Like parts are indicated by like letters throughout the several figures.

The brake-shoe, broadly considered, consists of a fibrous material, such as wood, the fiber of which has not been ruptured or broken, but which remains in substantially its natural condition, the said fibrous material having been compressed to an enormous degree or until the albuminous material in such fiber is expressed and the fibers are flattened and forced into close and intimate contact with each other. In other words, I employ as the shoe a fibrous material, preferably wood, in its natural state so far as the continuity of the fibers is concerned, but in a new state or condition to the extent that the softer portions of such fibrous material are expressed and the fibers proper are left in a solidified, compact, and enormously compressed condition.

I prefer to expose the ends of the fiber to the wheel, or, in other words, make the bearing-surface transverse to the line of the fibers, though this is perhaps not necessary in every case and not desirable under all conditions. This material used in a brake-shoe differs from pulp substances, such as

paper, in that it presents the natural fiber in its practically natural state, and experience shows that such fiber is far more lasting and effective than if the fiber had been broken up, reduced to pulp, and otherwise treated. On the other hand, this material is superior to natural fibrous substances, as, for example, wood in its natural state, in that it is free from the soft substances, such as the albuminous and other matters, which weaken and soften the material and permit it to wear rapidly and decay readily, and which also in some instances and to a degree may prevent its having the same frictional power. The fiber in the natural wood uncompressed is, so to speak, suspended in a substance in which it has a certain freedom of motion, whereas when compressed and such substance expressed the fibers are brought into the most intimate relation and practically have no individual motion. In the case of elm-wood, which I have treated and used very extensively in this manner on railway-trains, the compression is usually to about one-half the bulk of the natural wood, and the product is an extremely hard, close-grained, close-textured material. This substance is also found by experience to be superior to metal in that it begins the work of braking the wheel as soon as it is brought into proximity thereto, and therefore the frictional effect is applied and taken off gradually as distinguished from the effect of an ordinary metallic brake-shoe.

It is desirable to subject most woods to some treatment before compressing them in order to facilitate the compression and prevent injury to the material. Any suitable treatment that will bring about this result may of course be used, and I will only attempt to point out one particular treatment to which the wood may be subjected.

I wish to be understood as not limiting myself to any one method of treating the wood, as any other treatment which will allow the wood to be greatly compressed in the manner herein described will answer as well.

The natural wood, either hard or soft, is first subjected to the cooking action of a hot fluid, either in a liquid or gaseous form, by water boiling or steaming, so as to expand it, open its pores, soften the fibers, and dis-

solve the saps and juices, thereby bringing it into favorable condition for the next step in the treatment. In cases where the wood has been air or kiln dried so as to drive off the juices and saps the above process may be omitted.

The cured wood is next immersed in oil, preferably oil of penetrating quality, which will harden when it becomes cold. As the oil penetrates the wood better when hot I immerse the wood in oil which has been heated, or if the oil is cold when the wood is put in such oil is heated at some time during the immersion. I prefer to submerge the wood in the oil while still hot from the water, steam, or other treatment, and then to heat the oil until it boils gently. By this treatment the albuminous matter in the wood is either dissolved or so softened as to insure its being expelled when the compression takes place. At the same time the fibers are so softened that they may be readily brought into very intimate contact with each other, so as to form a dense textured product. I have found mineral oils to be peculiarly fitted for this use on account of their great penetrating quality. After the wood has been substantially saturated with oil I subject it, preferably while hot, to powerful pressure applied to the sides of the fibers, the pressure being sufficient to reduce the thickness or width of the wood preferably to one-half or one-third of its original thickness or width. The press employed for this purpose is preferably heated before or at the time the pressure is applied and should remain heated during the entire operation. The degree of compression and length of time during which the pressure is applied will of course depend upon the nature of the wood. The compression expels not only the softened albumen but also any surplus oil which may have been taken up by the wood. After the wood has been compressed sufficiently it is cooled in any desirable manner before releasing the pressure. The pressure is then released and the wood remains in this compacted and reduced state with the fibers in intimate contact as if by natural growth, there being no tendency for the wood to expand or resume its original size or form. In some cases it may be desirable to force the oil into the wood with pressure. If desired, the substance or material when ready for use in the brake-shoe or during the process of compression and treatment, may be further waterproofed, though it is usually rendered substantially waterproof by such compression. The wood may also be treated in any other desirable manner to make it fireproof. Wood subjected to this treatment when used as a brake-shoe has many advantages over any material now upon the market, as has been before stated.

A block of wood C of the desired shape is fastened in any convenient manner to the frame F, as, for example, by the screws C².

This frame is provided with projecting lugs, which are provided with holes adapted to register with holes in projecting lugs on the brake-block B when the shoe is in position, the frame and brake-block being connected together by the removable piece E. Said brake-block is connected to the brake-beam A by means of a bolt, or in any other desirable manner. In some cases it may be desirable to provide the side plates or supports D D, as shown in Fig. 4. I prefer to have two blocks C C separated at their middle, there being driven between them the block C', as shown, whereby the parts are securely attached to each other and held in position. When a shoe of this material is used, it immediately begins to brake, whatever the condition of the wheel when applied thereto, and produces a more effective brake than any now upon the market.

When wood in its natural state is brought against a rapidly-moving body, a large amount of heat is generated by the friction and the wood is burned or charred so as to change its character and cause it to crumble and become worthless.

I have found by experiment that the wood herein described will stand this heat without in any manner becoming charred or changed in its nature.

I claim—

1. A brake comprising a shoe adapted to make contact with the wheel and a holding or supporting device therefor, said shoe composed of highly-compressed wood in which the natural fibers remain unbroken and in their natural arrangement, the softer substances having been removed so that the fibers lie in a closer and more intimate contact and relation than when in the natural state.

2. A brake for vehicles comprising a brake-shoe adapted to make contact with the wheel, said brake-shoe composed of highly-compressed, fibrous material in which the natural fibers remain unbroken and in their natural arrangement, but from which the softer substances have been largely removed so that the fibers lie in a closer and more intimate contact and relation than when in the natural state.

3. A brake for vehicles or the like comprising a brake-shoe, a holding or supporting device therefor, said brake-shoe consisting of a highly-compressed and substantially homogeneous, moisture-proof block of wood in which the natural fibers remain unbroken and in their natural arrangement but from which the softer substances have been largely removed so that the fibers lie in a closer and more intimate relation than when in their natural state, whereby said shoe will not be injured or mutilated by the friction due to contact with the wheel.

4. A brake-shoe comprising a highly-compressed and substantially homogeneous block of wood in which the natural fibers remain

unbroken and in their natural arrangement,
and from which softer substances have been
largely removed so that the fibers lie in a
closer and more intimate relation than when
5 in the natural state, the block so positioned
that the ends of the fiber are exposed to the
wheel.

10 5. A brake-shoe comprising a highly-com-
pressed and substantially homogeneous block
of wood in which the natural fibers remain
unbroken and in their natural arrangement

and from which softer substances have been
largely removed so that the fibers lie in a
closer and more intimate relation than when
in the natural state, the wood so treated as 15
to be proof against charring by the heat de-
veloped when in contact with the moving
wheel.

JOHN McLACHLAN.

Witnesses:

DONALD M. CARTER,
BERTHA C. SIMS.