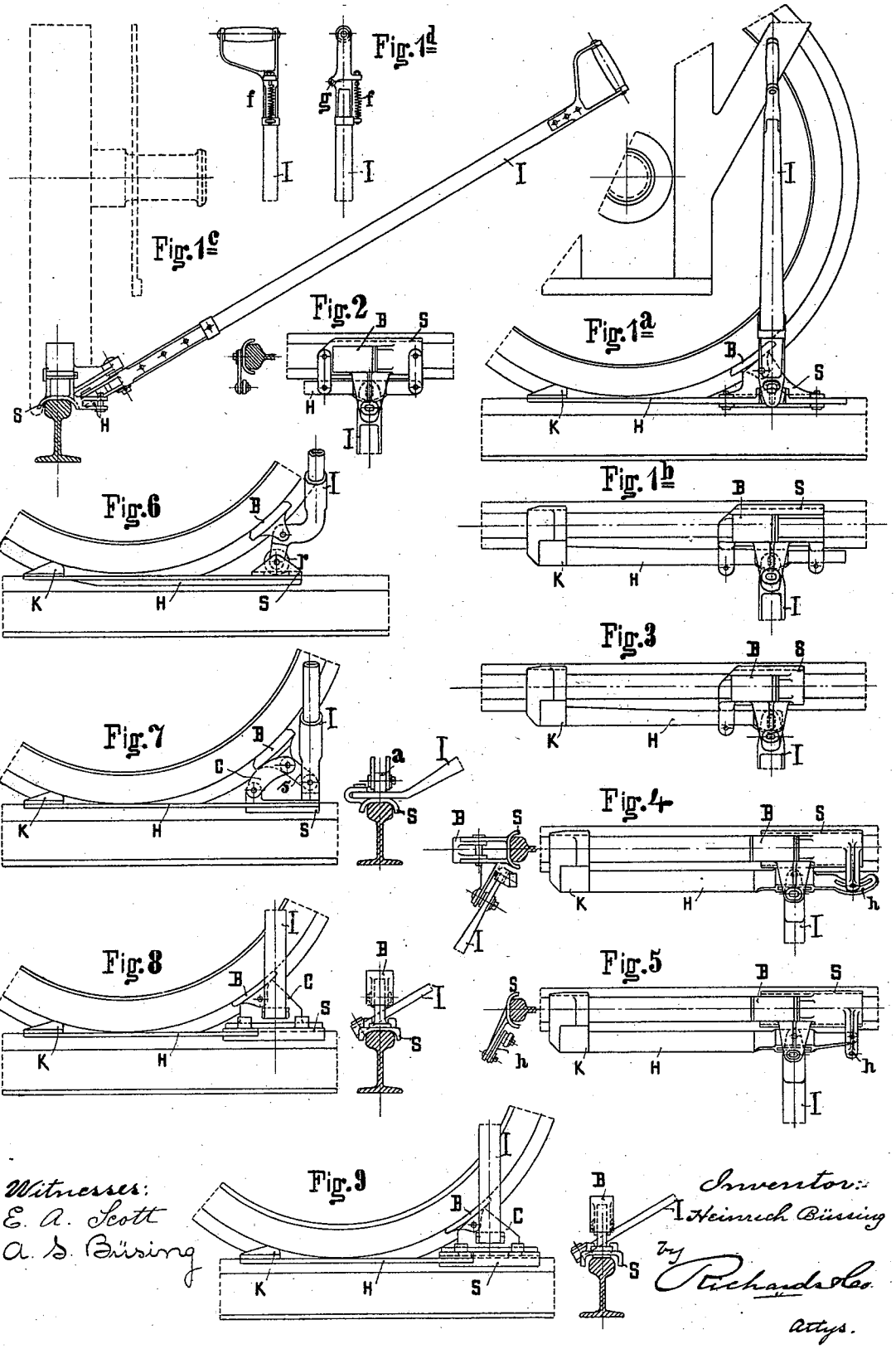
(No Model.) 2 Sheets—Sheet 1.

H. BÜSSING.

BRAKE.

No. 516,912. Patented Mar. 20, 1894.



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(No Model.) 2 Sheets—Sheet 2.

H. BÜSSING.

BRAKE.

No. 516,912. Patented Mar. 20, 1894.

Fig. 10a

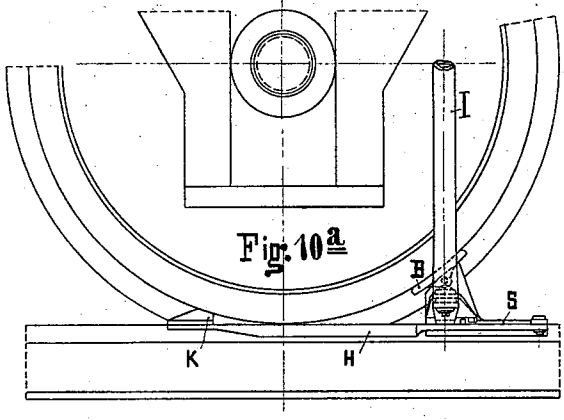


Fig. 10c

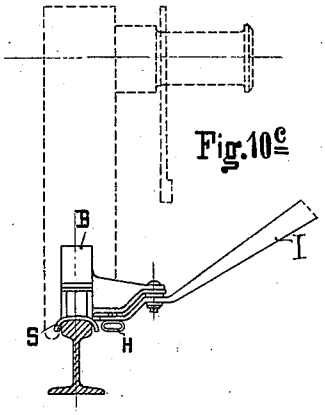


Fig. 10b

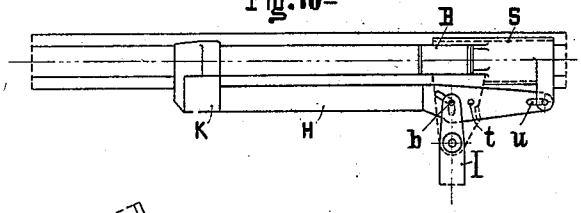


Fig. 10d

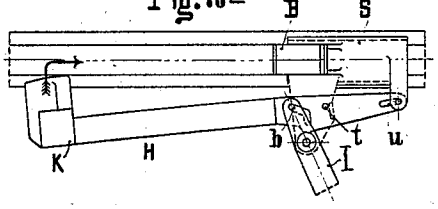


Fig. 12a

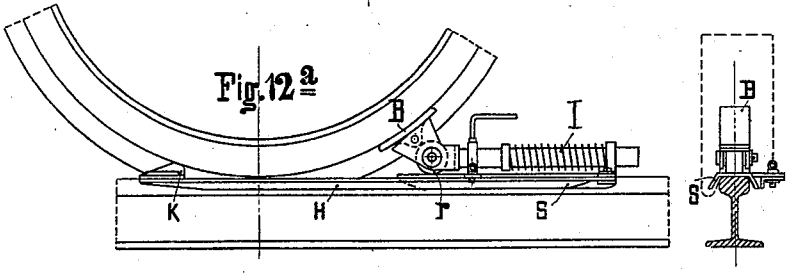


Fig. 12b

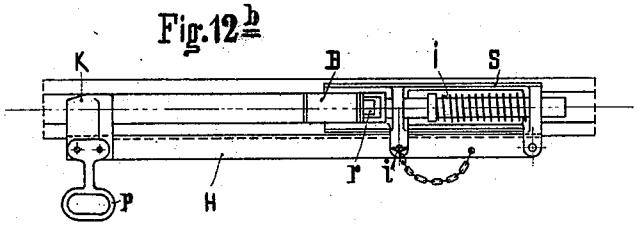


Fig. 12c

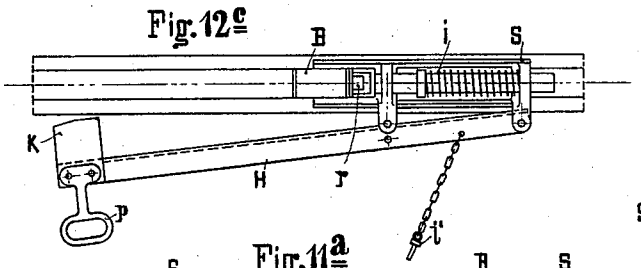


Fig. 11b

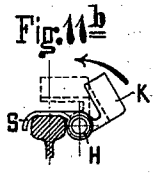


Fig. 11a

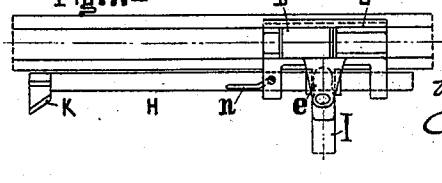
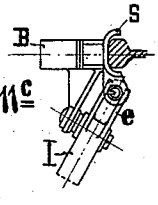


Fig. 11c



Witnesses:
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A. S. Büssing

Inventor:
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attys

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HEINRICH BÜSSING, OF BRUNSWICK, GERMANY.

BRAKE.

SPECIFICATION forming part of Letters Patent No. 516,912, dated March 20, 1894.

Application filed October 5, 1893. Serial No. 487,286. (No model.)

To all whom it may concern:

Be it known that I, HEINRICH BÜSSING, engineer, a subject of the Emperor of Germany, and a resident of Brunswick, Germany, have invented a certain new and useful Brake, of which the following is a specification.

The object of my invention is to provide a brake which is light and easily managed by one person, who can stop cars in motion at any place desired, without any kind of machinery being attached to the car, or without anyone being on board. Heretofore brake bars adapted to be pressed against the wheel, and "brake-blocks" have been used for this purpose, corresponding in shape to the circumference of the wheel and which are placed on the rails and against which the wagon wheel runs. The pressure of this "brake-block" can never be great until its horizontal component-power is equal to the sliding-friction between the "brake-block" and the rail, and the active power of the car is consumed through the sliding friction.

The object of my invention is to raise the pressure of the brake-block against the wheel, and with it the working of the brake, so that an exterior power, be it a spring, or human power, causes a pressure of the block against the wheel, while the wheel itself is not raised from the rail but remains upon it. It is clear that for this purpose it is necessary to create a counter-pressure, by which the desired pressure of the brake-block against the wheel is compensated. This counter-pressure is accomplished in the present invention by a block fastened on the other side of the point of contact of the wheel and rail, (the brake-block being before the wheel,) and when the brake-block is pressed against the opposite side of the wheel, this second block serves as a counter-rest for the pressure.

In the drawings:—Figure 1^a is an elevation of one form of my invention, and Fig. 1^b a plan of the same. Fig. 1^c is an end view. Fig. 1^d is a view of the upper end of the lever showing the handle in elevation and end view. Fig. 2, shows in plan and section a second form of the invention. Figs. 3, 4, 5, 6, 7, 8 and 9 are views of modified forms of the invention. Figs. 10^a, 10^b, 10^c, and 10^d show other modified forms. Figs. 11^a, 11^b, and 11^c show the rod H adapted to turn instead of swing. Figs. 12^a, 12^b, and 12^c show the brake operated by spring pressure instead of a hand lever.

The manner in which this block K may be placed in position behind the wheel is different. Either it is made tongue-shaped on the outside and can be placed on the rail together with the brake itself, so that the wheel which is to be stopped passes over it, (as shown on Sheet I, Figs. 1 to 9, and on Sheet II, Fig. 12,) or the block can be put in place by swinging it from the side behind the wheel by means of a connecting-rod H (Sheet I Figs. 10 and 11.) which is turnable around a perpendicular or on its own longitudinal axis. By this means the support for the reactive power is gained, and now only remains to be explained the different forms of the constructions which may be employed.

In the apparatus are the following principal parts to be distinguished, which reappear in every form. The brake-block itself (marked in all the drawings by letter B.) The part which directly or indirectly bears the brake-block and which rests on the rail, and secures the proper position of the whole apparatus. This is called the brake-shoe and is marked in the drawings by the letter S. The before mentioned counter-block which passes on the opposite side of the wheel (K). The connecting of the counter-block with the brake-shoe marked in all the drawings by H. That part which is used to effect the working of the brake-blocks B and K by means of an exterior pressure (human power or spring) by being pressed against each other; is marked in the drawings by the letter I.

The different forms of construction only differ from each other in the manner in which all the different parts can be relatively moved. First those forms will be described by which the brake-pressure is attained through human power by means of a lever, and above all the cases in which the counter-block K, being in position at the back of the wheel, permits it to pass over. By these forms the succession of the single functions is as follows: First of all the whole apparatus is laid on the rail, so that the brake-shoe S rests firmly on the rail. An operator with the lever in his hand awaits the approaching car, which is to be stopped. The front wheel

passes over the counter-block K and strikes against brake-block B, upon which the wheel pushes the apparatus sliding on the rail before it and the operator, going beside the car, draws back the lever I and in this manner he draws together brake-block B and counter-block K, by which the working of the brake is accomplished. Such an arrangement is to be seen in Figs. 1^a, 1^b and 1^c from the side the ground plan and from the track. The brake-block B has been fitted to the brake-shoe S and made somewhat movable for the purpose of fitting better to the wheel. The counterblock K is firm on the connecting-rod H, which latter can move in guides at the side of brake-shoe S. This sliding is effected by the lever I, which the operator draws back after the wheel has passed over the block K. This lever has its one center of motion on a projection of the brake-shoe S and the other on the connecting-rod H. The bolt of the lever moves in a longitudinal slit, so that it is possible to move the rod H in a straight-line motion in the direction of the track.

To lessen the jolt the operator may receive by the contact of the wheel with the apparatus, the handle of the lever I might be furnished with a spring, as is to be seen in Fig. 1^d. The handle at the joint *g* can be turned and is kept in place by a suitably strong spring.

Fig. 2 shows a slight difference from the construction described. The rod H, instead of being movable through the sliding motion, is made so here, through a parallelogram arrangement and is so held in a parallel direction with the rail. In all else the construction is exactly the same as is represented in Fig. 1.

Another form of the device is shown in Fig. 3 where one of the guides of Fig. 1^b is omitted.

In Fig. 4, the guide *h* is upon the other side of the lever I and shaped to a curve, the geometrical position of which is such that although the turning-joint between lever I and connecting-rod H is not made here by means of a slit and bolt, but by means of a round hole and bolt and is consequently compulsory motion, the rod H can only be moved in a line parallel to the rail.

In Fig. 5 this guide is replaced by the car *h*, which requires the connecting-rod H to move in a parallel direction.

In the constructions hitherto described, the general principle may hold good, that the brake-block B (apart from its own minor flexibility) is firmly attached to the brake-shoe S and that the counter-block K together with the connecting-rod H by a proper guiding of the latter, is pushed against the brake-shoe S so that the one center of motion of the lever I is connected with the brake-shoe S and the other with the rod H, through which in turning the lever the drawing together of the brake-block B and the counter-block K is effected.

Now follows a succession of forms of construction in which the counter-block K, the connecting-rod H and the brake-shoe S are firmly joined together, while the brake-block B can be pushed up against the brake-shoe S. The simplest form of this principle is represented in Fig. 6. The lever I here not only serves to make the pressure, but guides alone the brake-block B, the latter being attached to it and because of its exact fitting to the wheel, is flexible in the same manner as before described, while the lever itself has its farthest center of motion in the brake-shoe S. It must be still remarked that in this figure there is an arrangement shown, which is also possible in the other constructions. The counter-pressure on the rail, produced by the pressure of the brake-block B against the wheel, is taken up by a roller *r* attached to the brake-shoe S and which passes through a slit in the brake-shoe and rests on the rail and so changes the sliding friction into a rolling one.

The arrangement which Fig. 7 shows, differs but little from the one just described. The center of motion of the lever I on the brake-shoe S has a perpendicular axis here, instead of a horizontal one, as in the preceding case, and is on the inside of the rail; hence the whole lower end of this lever is made horizontal. Between the brake-block B and the eye *a* attached to the lever I which serves to admit a turning-bolt, still an intermediate piece *s* is inserted and the brake-block B itself is guided on the brake-shoe S by the turning-bar C.

In Figs. 8 and 9 the brake-block B is not joined direct to the lever I but is on a block C, which on its part can be moved in a sliding motion against the brake-shoe S. The lever I which has its turning-point again on the brake-shoe, and again on the inner side of the rail passes through an opening in the block C and pushes by its turning the block and brake-block against the wheel.

The only difference in Fig. 9 from Fig. 8 is that here block C through a slit in the brake-shoe S touches direct upon the rail, so that by the pressure of the brake the raised sliding friction that takes place between the rail and block C can be used direct to increase the working of the brake-block B.

Now follow two arrangements by which brake-pressure is produced also by human power and by means of the lever I, but by which the wheel does not drive over the counter-block K but drives directly against the brake-block B upon which the operator by means of the mechanism places the block K which has been lying beside the rail, behind the wheel and then brings into action the working of the brake as has already been described.

Fig. 10^d shows in the ground-plan the position of the apparatus before the arrival of the car. The lever I has a center of motion on a projection of the brake-shoe the bolt *b* at its end moves in a curved slit of the rod

H, the first part lies slanting the latter at right angles to the rail. The rod H has at the end behind still another slit *u* and is provided with a pivot *t* which touches a projection on the brake-shoe S. After the wheel has entered and the swinging of the lever I to the left takes place, by means of the slanting part of the slit which guides the bolt *b*, first the rod H and with it the counter-block K swings on to the rail, by which the pivot *t* held back by the projection which it touches, prevents the sliding in the direction of the rail and insures the turning movement until the bolt *b* enters the second part of its slit (Fig. 10[b]) upon which a pushing of the rod and the block in the direction of the rail takes place, which is possible so far as that the pivot *t* has left the projection before mentioned and made way through the slit *u* for this movement. Instead of swinging in the counter-block K after the wheel has passed by turning on a perpendicular axis one can attain the same object by turning the rod H (which in this case is better round) around its longitudinal axis. This arrangement is shown in Figs. 11[a], 11[b] and 11[c]. The head of the lever I which performs here the motion of the rod H is formed like a coupling-bar. The nut *u* in conjunction with the pivot affects during the first part of the motion a simultaneous turning, by which the block K comes on the rail, while in the second part of the movement only a longitudinal motion takes place.

It is now only necessary to give an example of how the spring-power instead of human power can be used. In Figs. 12[a], 12[b] and 12[c] such an arrangement is represented. The brake-block B is here movable on the brake-shoe S and has a roller *r* to lessen the friction. A spring *i* presses the brake block continually in the direction toward the wheel. When the wheel has passed over the counter-block, it presses back, as far as its space demands, the brake-block B and compresses the spring *i* by which a brake pressure is effected, the power of which depends upon the dimensions of the spring. As it would be very difficult to remove the brake from the wheel with the spring in a compressed condition, a junction could be made on some part of the apparatus, which when loosened admits the extension of the spring. The drawings show that such is possible as, after the withdrawing of the peg *i'*, the lever I by means of the handle *p* is swung out and so the counter-block K can be drawn away from the wheel.

I claim as my invention—

1. A brake consisting of a support or shoe fitted to the rail, a brake block supported therefrom with means for operating it and a supplemental brake block K, substantially as described.

2. A brake consisting of a shoe fitted to the rail, a brake block supported thereby, means for operating it, a rod H and supplemental brake block K on the end of said rod, substantially as described.

3. A brake consisting of a shoe fitted to the rail, a brake block supported thereby, a rod H, a supplemental brake block K and an operating means for moving the brake blocks toward each other, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

HEINRICH BÜSSING.

Witnesses:
JULIUS FEEKEL,
PETTY M. ANDREWS.