

Nov. 25, 1958

W. B. DEAN

2,861,654

RAILWAY DISK BRAKES

Filed July 10, 1956

4 Sheets-Sheet 1

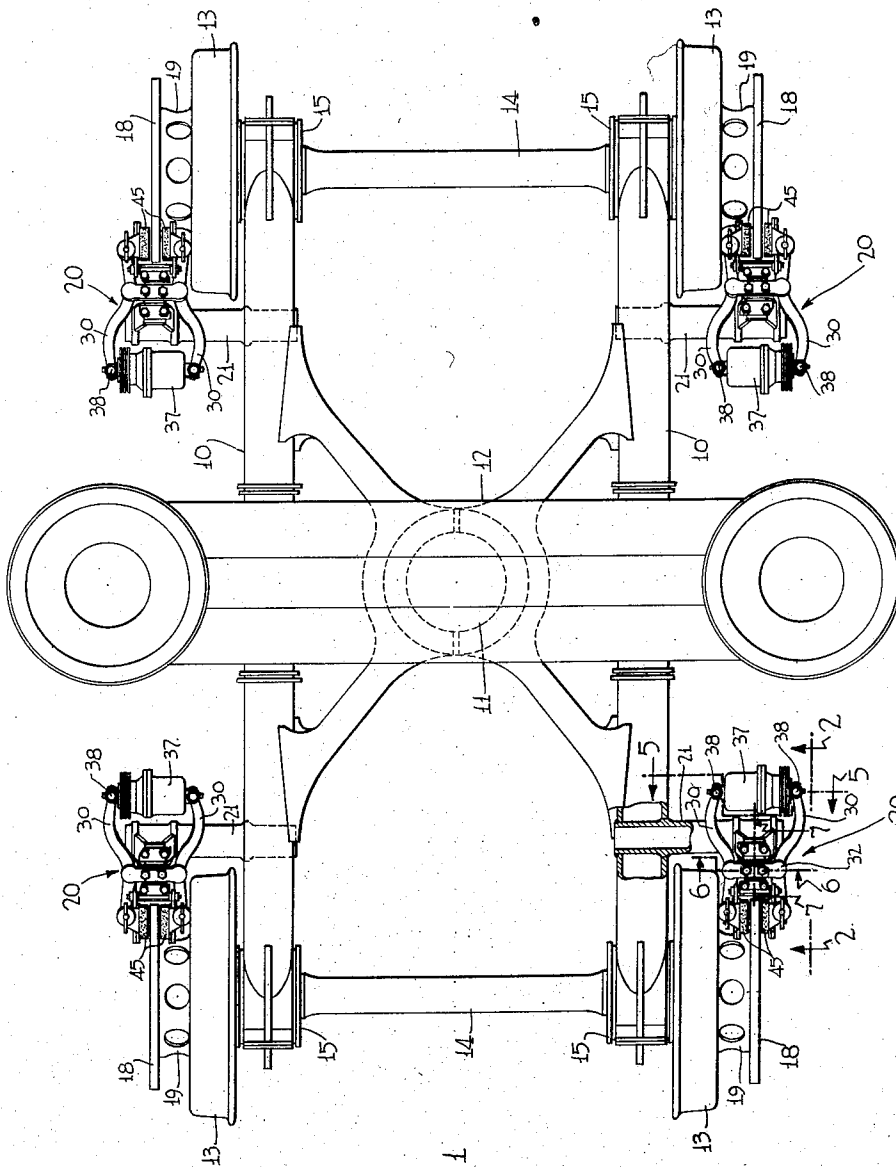


FIG. 1

INVENTOR

Walter B. Dean.

BY

Wm. R. Glisson  
ATTORNEY

Nov. 25, 1958

W. B. DEAN

2,861,654

RAILWAY DISK BRAKES

Filed July 10, 1956

4 Sheets-Sheet 2

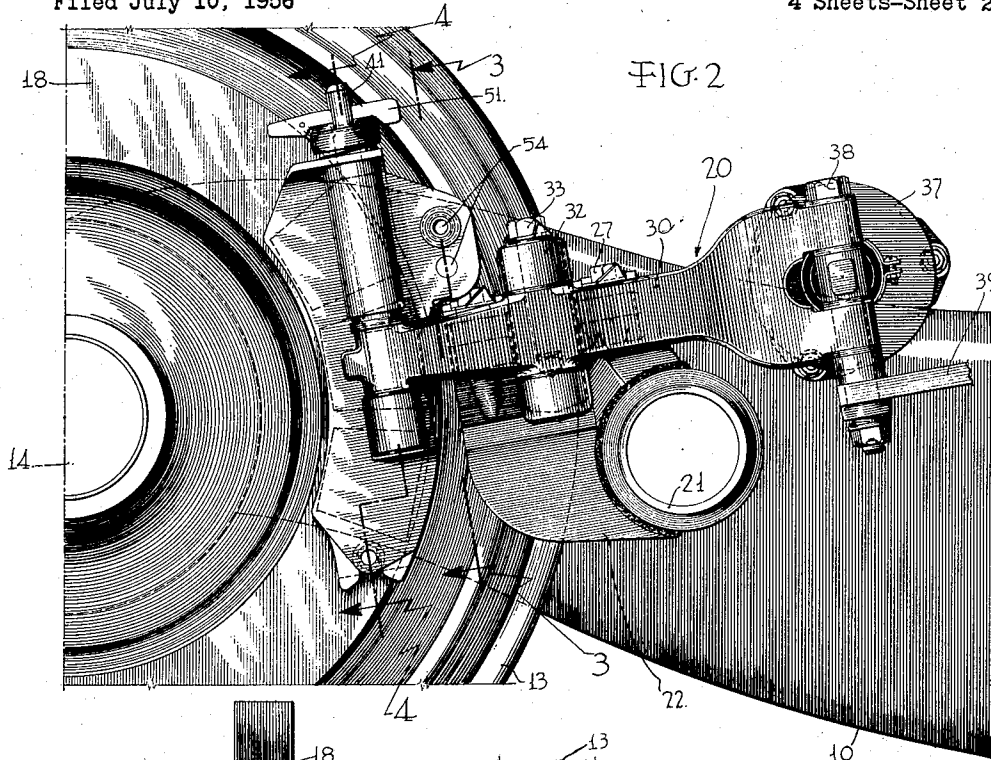


FIG. 2

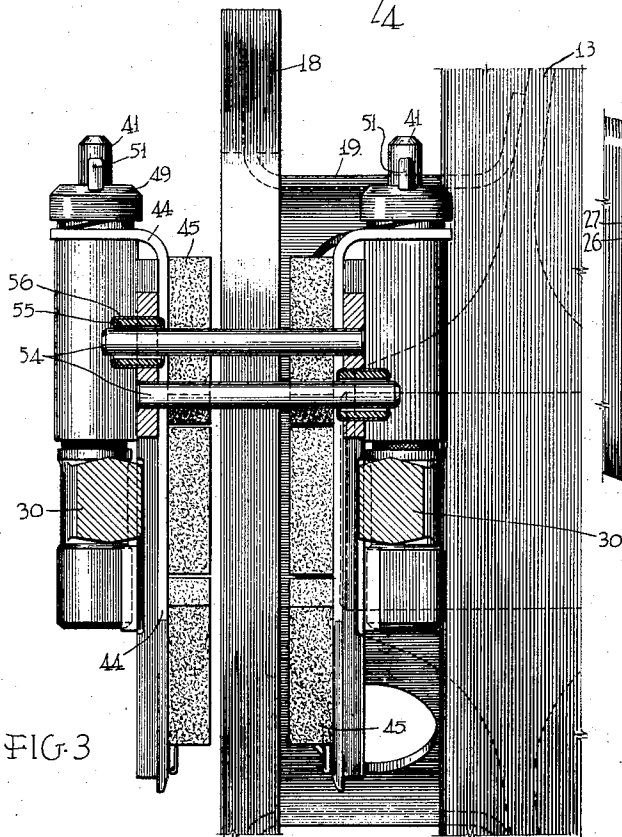


FIG. 3

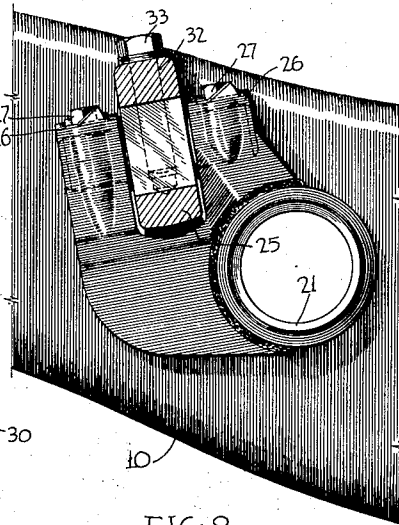


FIG. 8

INVENTOR

Walter B. Dean

BY

Wm. R. Glisson  
ATTORNEY

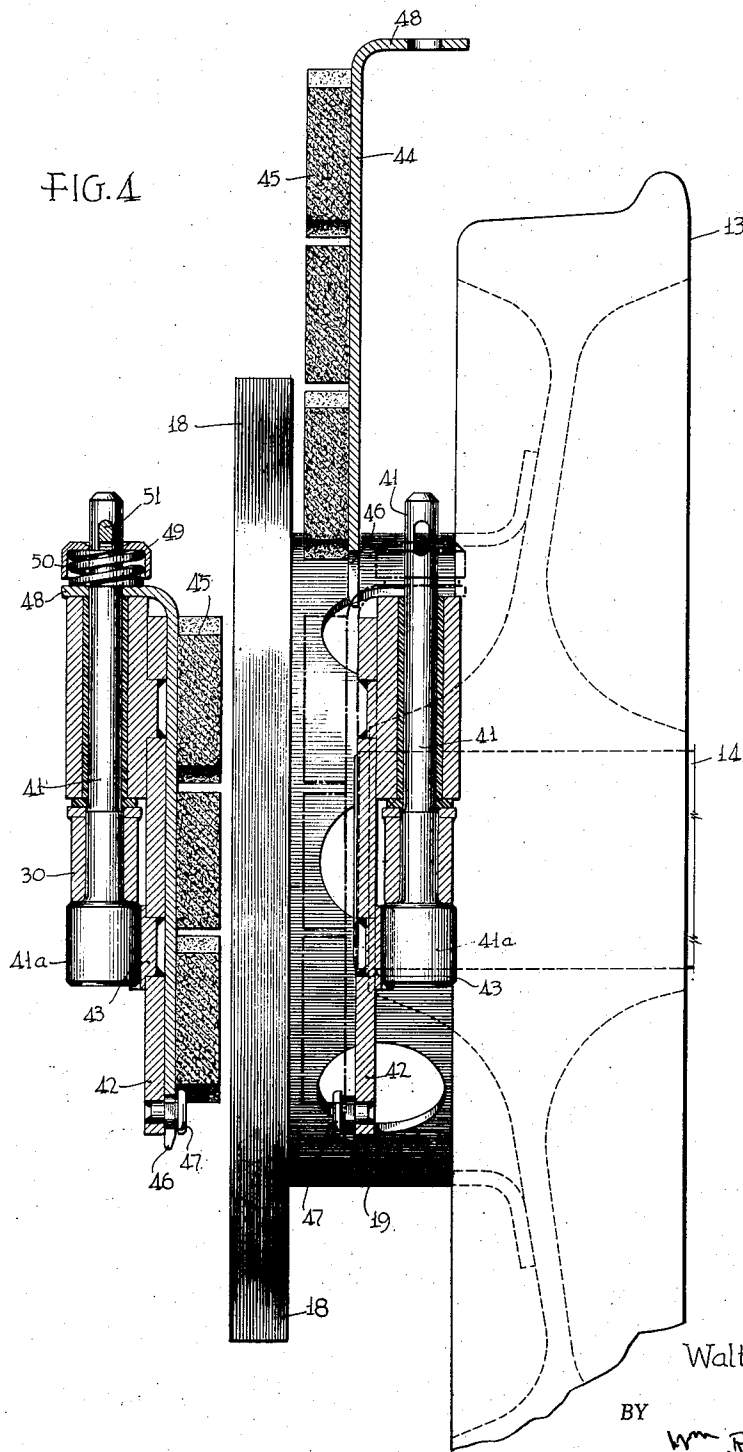
Nov. 25, 1958

W. B. DEAN  
RAILWAY DISK BRAKES

2,861,654

Filed July 10, 1956

4 Sheets—Sheet 3



INVENTOR

Walter B. Dean

BY

Wm. P. Glisson  
ATTORNEY

Nov. 25, 1958

W. B. DEAN

2,861,654

RAILWAY DISK BRAKES

Filed July 10, 1956

4 Sheets—Sheet 4

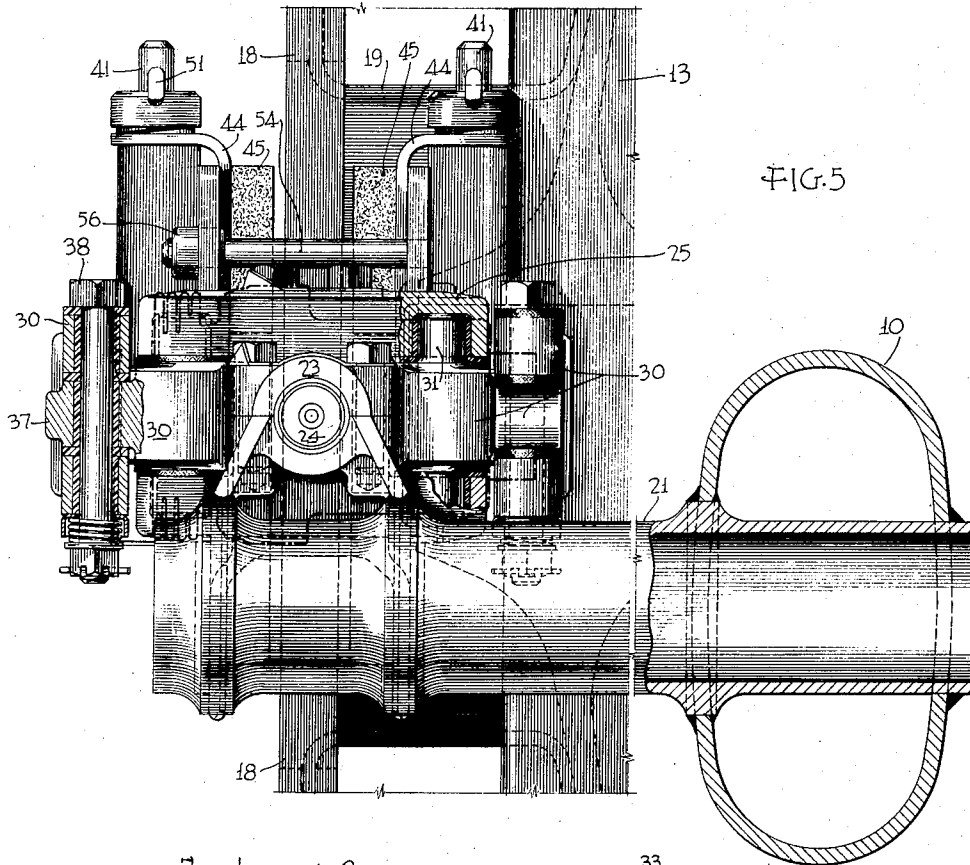


FIG. 5

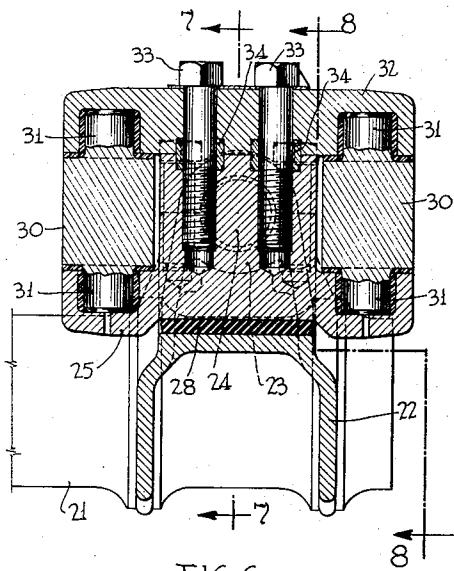


FIG. 6

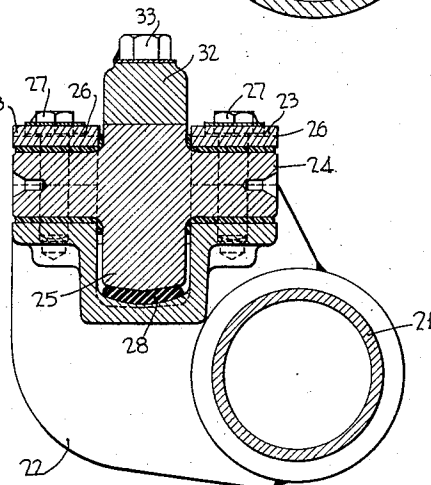


FIG. 7

INVENTOR

Walter B. Dean.

BY

Wm. R. Ellison  
ATTORNEY

1

2,861,654

## RAILWAY DISK BRAKES

Walter B. Dean, Narberth, Pa., assignor to The Budd Company, Philadelphia, Pa., a corporation of Pennsylvania

Application July 10, 1956, Serial No. 596,885

4 Claims. (Cl. 188—59)

This invention relates to railway disk brakes and has for an object the provision of improvements in this art.

One of the particular objects of the invention is to provide a disk brake assembly which is simple in construction and light in weight and which is mounted exteriorly of the truck and wheels where it will be accessible for inspection and service.

Another object is to provide a brake assembly which has adequate turning joints to accommodate for all movements necessary for the shoes to follow the disk.

Another object is to provide shoe mounting plates or heads having guide means which keep the shoes parallel and avoid cramping of the heads on the guide means.

Another object is to provide shoe head guide means located at one side of the plane through the axes of the pins supporting the shoe heads on the tong levers thus providing easy insertion and removal of shoes and allowing the shoes to be of simple inexpensive construction with a simple bent flange for mounting on the pin.

Another object is to provide an improved longitudinal joint with simple securing means which permits quick removal of the entire brake unit. Also improved resilient reaction means to restrain the extent of turning movement about the longitudinal axis.

The above and other objects and various advantages of the invention will be apparent from the following description of an exemplary embodiment, reference being made to the accompanying drawings thereof, wherein:

Fig. 1 is a plan view of a railway car truck provided with brakes embodying the invention;

Fig. 2 is an enlarged outside elevation of one brake assembly, the view being taken on the line 2—2 of Fig. 1;

Fig. 3 is a transverse generally vertical section taken on the line 3—3 of Fig. 2;

Fig. 4 is a further enlarged transverse generally vertical section taken on the line 4—4 of Fig. 2 and showing one brake shoe being removed from the assembly;

Fig. 5 is an enlarged transverse vertical elevation, partly in section, taken on the line 5—5 of Fig. 2, and with the operating power device omitted;

Fig. 6 is an enlarged longitudinal vertical section taken on the line 6—6 of Fig. 1;

Fig. 7 is a transverse vertical section taken on the line 7—7 of Fig. 6, the section line also being shown on Fig. 1; and

Fig. 8 is a longitudinal vertical section taken on the line 8—8 of Fig. 6.

In order to understand the kind of movements which the present brake mounting is adapted to accommodate, Fig. 1 shows a truck on which it can be used. The truck includes rigid side frames 10 having loose universal movement about a center or king pin 11 of a bolster 12 which supports and moves with a car body, not shown. Rigid wheel-axle units which comprise wheels 13 and axles 14 are mounted in bearing boxes 15 of the side frames so as to have restrained free movement, as for example in spherical anti-friction bearings having the outer race carried in rubber, so as to allow the side frames

2

to rock up and down about a horizontal transverse axis to accommodate for track irregularities but to strongly maintain the rectangular shape of the frame. This truck is the subject of a copending application of the same applicant herein, Serial No. 562,180, filed January 30, 1956.

The wheels 13 carry brake disks 18, the disks being secured by flanges 19 to the webs of the wheels. The flanges have openings to assist cooling and to reduce transfer of heat to the wheels.

The brake units 20 which are provided hereby to cooperate with the disks 18 are mounted on heavy stub beams 21 secured to the side frames 10, as by arc welding, and project outwardly from the side frames.

From this it will be seen that the brake units which are mounted on the frame will follow the disk movements fairly closely but that there is some turning movement between the disks and brake units about a generally horizontal longitudinal axis.

The brake unit comprises a base 22 which is strongly secured to a stub beam 21, as by arc welding, and which is provided with fore and aft bearings 23 for the longitudinal journals 24 of a saddle or brake frame 25. Removable bearing caps 26, each secured by two cap screws 27, secure the saddle to the base.

The turning movement between the saddle and base about the longitudinal axis of the journals 24 is limited (Figs. 6 and 7) by a body or pad of resilient material 28, such as rubber or the like, which is disposed between broad facing surfaces of the base and saddle, the surfaces being somewhat arcuate in cross section in a vertical longitudinal plane so as to maintain a central position between the sides of the facing surfaces. In assembling, it is only necessary to force the saddle down on the rubber pad as the bearing cap screws are tightened and in disassembling it is only necessary to remove the bearing caps so that the entire saddle assembly unit can be lifted off the resilient pad and base. While the pad is located in a recess and tends to remain in place, it may be bonded to one of the facing surfaces if desired.

On each side of the saddle there is mounted a brake tong lever 30 having journals 31 disposed generally vertically, the lower journals being disposed in bushed bearing sockets in the lower part of the saddle and the upper journals being disposed in aligned bushed bearing sockets of a removable cap 32 held by cap screws 33. By removing the two cap screws 33 the entire brake assembly, as a loose unit minus the saddle, can be lifted off. The cap is held accurately in position by pilot sleeves 34 around the cap screws.

As shown in Fig. 1, the brake tong levers 30 are both operated by a fluid power device 37 disposed between the outer ends of the levers and is connected thereto by pivot pins 38. The brakes may be operated by hand as well as by power and Fig. 2 shows one arm 39 of a linkage system for operating the brakes by means other than the fluid power devices 37 but this secondary operating linkage is omitted from the other views.

The tong levers 30 at their inner ends alongside the braking surfaces of the disk 18 have pivoted thereto by pins 41 the brake heads or plates 42. The brake heads are removable in a generally vertical direction from the pivot pins 41, the head 41a of a pin 41 merely fitting against a bearing seat or socket 43 carried by the head 42. Preferably the pin 41 has a drive fit in the tong lever so it will not fall out and operates in a bushed bearing in the shoe head.

A shoe plate 44, which carries the brake lining blocks 45 of non-metallic composition material, has at its lower end a fork or slot 46 which embraces the shank of a headed stud pin 47 fixed in the head 42 and has at its upper end a bent flange 48 having a hole which embraces the upper end of the pivot pin 41. A cap 49, a spring

50 and a key pin 51 entered in an elongated hole in the pivot pin 41 retain the brake shoe plate 44 and the shoe head 42 on the pivot pin 41. Fig. 4 shows at the right side how one of the brake shoes may be removed by removing the key, spring and cap and lifting the shoe straight up.

To keep the paired brake heads and shoes lined up together guide pins 54 are provided, as shown in Figs. 2 and 3. These pins are disposed in a plane parallel to a plane through the axes of pivot pins 41 and at the side toward the saddle clear of the periphery of the brake disk 18. One guide pin has a drive fit in a radial extension in each of the heads and has a loose guided fit in the other heads in a hard wear-resisting non-metallic bushing 55, as of "Micarta" or the like, this being a phenolic condensation product of the "Bakelite" type, carried in a metal retainer 56 driven into a hole in the head.

In previous brake assemblies of a related type a single guide pin with a close fit has been located in the plane of the pivot pins but this has given trouble by binding or cramping as the head tended to twist or tilt and, moreover, it interfered with the straight-up removal of the shoes and required a complicated shape for the bent retaining flange of the shoes.

The present arrangement of two pins, one on each head, in a plane at one side of the pivot pin plane and having a relatively loose fit in non-metallic guides provides improved guidance without cramping and permits a simpler shoe arrangement and a simpler removal movement to be employed.

It is thus seen that the invention provides a very simple, light, inexpensive brake assembly which can be readily inspected and serviced.

While one embodiment of the invention has been described for purposes of illustration it is to be understood that there may be various embodiments and modifications within the general scope of the invention.

What is claimed is:

1. Disk brake mechanism adapted to be mounted on a truck frame carrying a wheel and axle unit on which a brake disk is mounted, comprising in combination with

the brake disk, brake operating levers mounted on opposite sides of the disk, brake heads mounted on parallel axes on said brake levers, each brake head having a radial extension intermediate its length projecting beyond the circumference of the disk, removable brake shoes carried by said brake heads for acting against opposite sides of said disk, each brake shoe including a backing plate carrying brake lining and guide means between the radial extensions of said brake heads outside the circumference of said brake disk and at one side of a plane through said brake head axes, said guide means including a guide pin secured to one brake head and a tubular non-metallic guide bushing carried by the other brake head and slidably fitting said guide pin.

2. Disk brake mechanism as set forth in claim 1, wherein each brake head extension is provided with a guide pin and each opposite brake head is provided with a non-metallic bushing slidably embracing a guide pin.

3. Disk brake mechanism as set forth in claim 2, wherein said guide pins have their axes arranged in a plane which is generally parallel to the plane through said brake head axes.

4. Disk brake mechanism as set forth in claim 2, wherein said non-metallic bushings are composed of a hard plastic material, such as a phenolic condensation product, carried in metal sleeves which are force-fitted in holes in the brake heads.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

2,025,830	Rosmait	Dec. 31, 1935
2,326,000	Teepie	Aug. 3, 1943
2,402,386	Eksergian et al.	June 18, 1946
2,451,329	Gaenssle	Oct. 12, 1948
2,504,668	Eksergian	Apr. 18, 1950
2,504,712	Mann	Apr. 18, 1950
2,527,072	Pogue	Oct. 24, 1950
2,590,062	Bachman	Mar. 18, 1952
2,622,704	Gaenssle et al.	Dec. 23, 1952
2,760,601	Gaenssle	Aug. 28, 1956
2,777,540	Bachman	Jan. 15, 1957