Nov. 10, 1959 J. G. GERGELY 2,912,233

SHOCK ABSORBER TYPE SUPPORT FOR MOLDBOARDS

Filed Jan. 22, 1958 2 Sheets-Sheet 1

Fig. 8

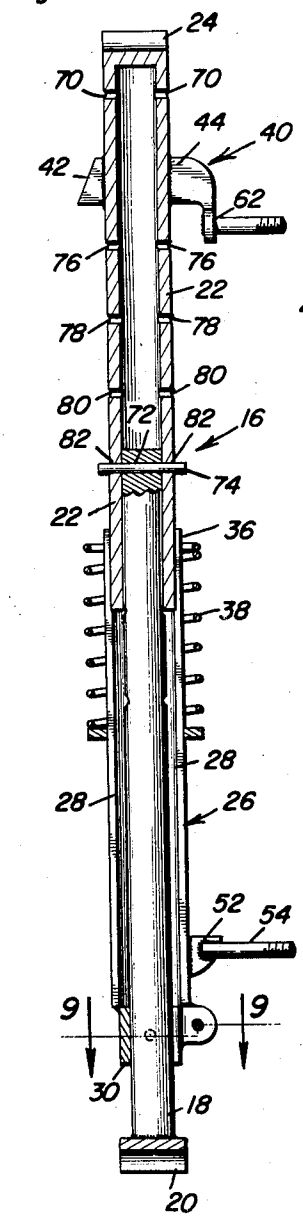


Fig. 7

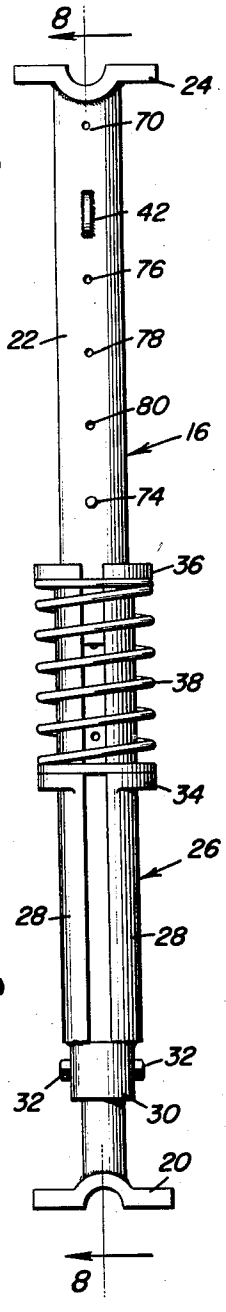


Fig. 1

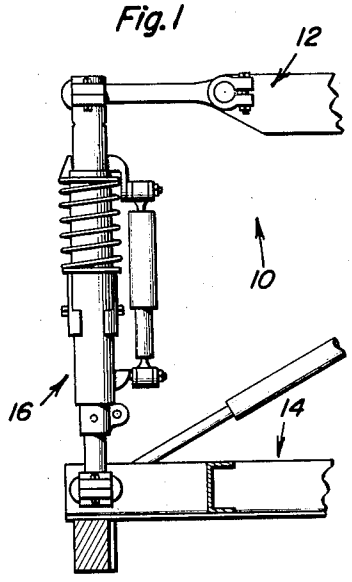
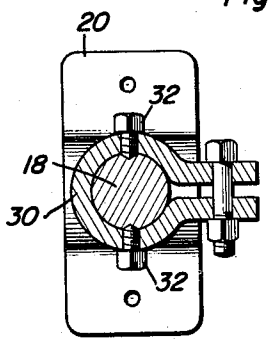


Fig. 9



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Nov. 10, 1959 J. G. GERGELY 2,912,233

SHOCK ABSORBER TYPE SUPPORT FOR MOLDBOARDS

Filed Jan. 22, 1958 2 Sheets-Sheet 2

Fig. 3

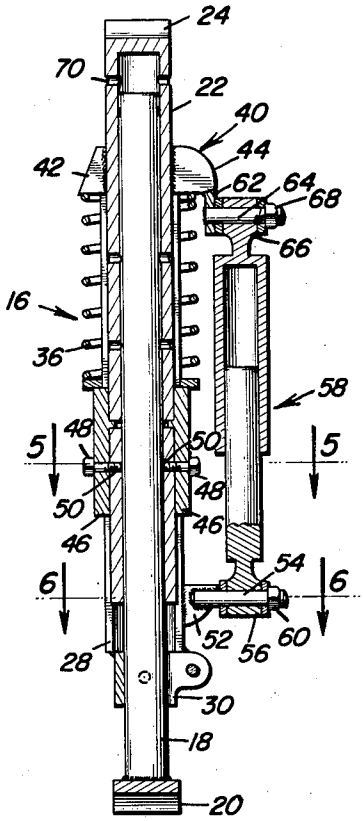


Fig. 2

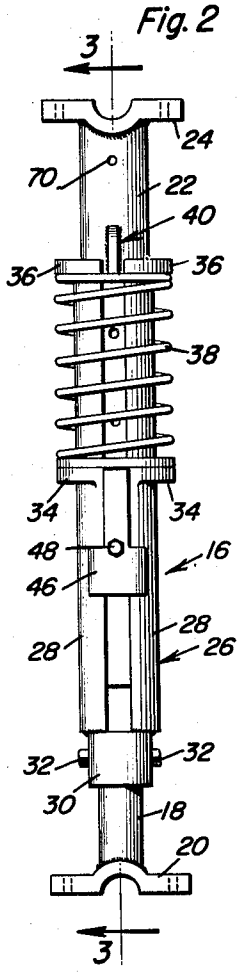
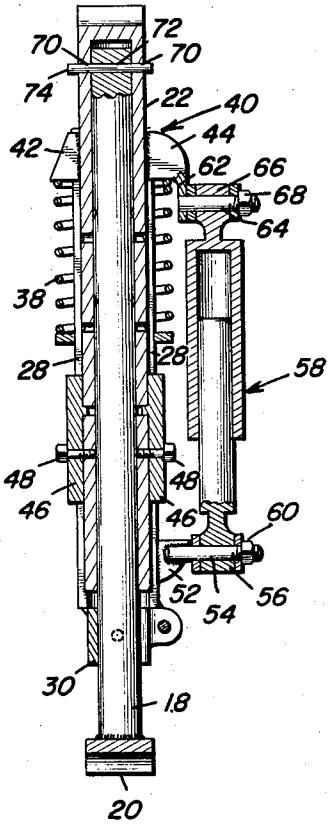


Fig. 4



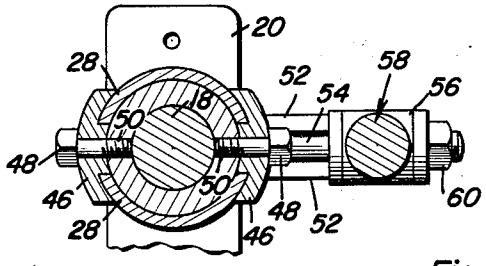
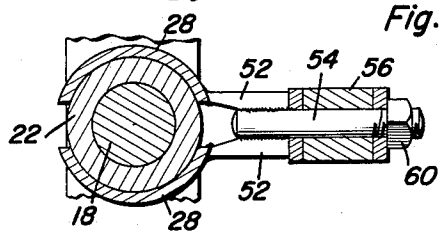


Fig. 5

Fig. 6



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2,912,233

SHOCK ABSORBER TYPE SUPPORT FOR MOLDBOARDS

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Application January 22, 1958, Serial No. 710,490
8 Claims. (Cl. 267—1)

This invention relates in general to new and useful improvements in road graders, and more specifically to a shock absorber type support for the moldboards of road graders.

At the present time the moldboard of a road grader is suspended from its mounting frame by means of an extensible support. However, the extensible support is selectively fixed as to length and forms a rigid support member when in use. As a result, there is a rigid connection between the moldboard and its supporting frame and no give in the moldboard when it strikes a relatively immovable object. While in certain instances this is desirable, in many others it is undesirable. For example, when a road grader is being used for the purpose of removing snow, it is desirable that the blade of the road grader follow the contour of the road as closely as possible. However, because all roads, particularly in the wintertime, have humps and the like, when the moldboard hits the hump, there is a tendency for the moldboard or it blade to remove the hump and thus damage the road surface. On the other hand, if the blade will not remove the hump, then the moldboard and the blade will bounce and the road will not be properly cleaned in that area. The foregoing is also true when one is attempting to smooth an existing road.

It is therefore the primary object of this invention to provide an improved support for moldboards of road graders, the support being so constructed whereby it is of the shock absorber type.

Another object of this invention is to provide an improved support for road grader moldboards, the support including first and second support members which are disposed in telescoped relation and which are resiliently restrained against movement either apart or towards each other so that the support has a fixed length during the normal use of the road grader and at the same time the length thereof will shorten or elongate as is required during a road cleaning or grading operation.

Still another object of this invention is to provide an improved support for moldboards of road graders and the like, the support being of the shock absorbent type and including first and second support members which are disposed in telescoped relation, there being disposed in intermediate parts of the support members a spring to resiliently resist relative movement between the support members, there also being provided a shock absorber of the double acting type for the dampening of any action of the spring.

A further object of this invention is to provide an improved shock absorber type support for moldboards of road graders, the support being formed of two support members which are relatively slidable with respect to each other and resiliently connected so as to resist either elongation or foreshortening, the resilient connection between the support members being of such a nature whereby it may be readily released and the support members rigidly connected together, as is desired.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a fragmentary sectional view taken through a road grader and shows the relative position of the moldboard support which is the subject of this invention;

Figure 2 is an enlarged elevational view of the moldboard support of Figure 1 and shows further the details thereof;

Figure 3 is an enlarged vertical sectional view taken substantially upon the plane indicated by the section line 3—3 of Figure 2 and shows the specific details of construction of the support;

Figure 4 is an enlarged vertical sectional view similar to Figure 3 and shows the support in its foreshortened position with the support members rigidly connected together and the shock absorbing feature of the support being temporarily locked out;

Figure 5 is an enlarged transverse sectional view taken substantially upon the plane indicated by the section line 5—5 of Figure 3 and shows the relationship of the telescoped support members, the sleeve for carrying the spring and lower stop members carried by the outermost suppotr member;

Figure 6 is an enlarged transverse sectional view taken substantially upon the plane indicated by the section line 6—6 of Figure 3 and shows the details of the lower connection between the shock absorber and the sleeve;

Figure 7 is an enlarged elevational view of the support in its extended position;

Figure 8 is an enlarged vertical sectional view taken substantially upon the plane indicated by the section line 8—8 of Figure 7 and shows the arrangement of the components of the support in its extended position; and

Figure 9 is an enlarged transverse sectional view taken substantially upon the plane indicated by the section line 9—9 of Figure 8 and shows the manner in which the sleeve is clamped to the lower support member.

Referring now to the drawings in detail, it will be seen that there is illustrated in Figure 1 a part of a conventional type of road grader which is referred to in general by the reference numeral **10**. The road grader **10** includes an upper moldboard supporting frame assembly **12** and a lower moldboard supporting frame assembly **14**. There is normally provided a support which extends between the upper moldboard supporting frame assembly **12** and the lower moldboard supporting frame assembly **14**. This support (not shown), however, has been replaced by a shock absorber type of support which is referred to in general by the reference numeral **16** and which is the subject of this invention.

Referring now to Figures 2 and 3 in particular, it will be seen that the moldboard support **16** includes a first support member **18** which is solid and which is provided at the lower end thereof with a fitting **20** for attachment to the lower moldboard supporting frame assembly **14**. Telescoped over the upper part of the lower support member **18**, which will be considered a first support member, is a second and upper support member **22**. The upper end of the support member **22** is provided with a fitting **24** for attachment to the upper moldboard supporting frame assembly **12**. It is to be noted that the upper support member **22** is tubular with the upper end thereof closed.

Telescoped over the support members **18** and **22** is a sleeve which is referred to in general by the reference numeral **26**. The sleeve **26** includes a pair of spaced sleeve sections **28** which are telescoped over the upper support member **22**. The sleeve sections **28** depend below the upper support member **22** and terminate in a clamp **30** at their lower ends. The clamp **30** is clamped about the lower part of the lower support member **18** and is retained in place by a pair of setscrews **32**.

The sleeve sections **28** are provided with transversely aligned lower spring seats **34** which face upwardly. The upper ends of the sleeve sections **28** terminate in downwardly facing upper spring seats **36**. Disposed between the spring seats **34** and **36** and telescoped over the upper

portion of the sleeve section 28 is a coil spring 38. The coil spring 38 is of a length to extend between the spring seats 34 and 36 and have a slight compressive engagement therewith.

Carried by the upper part of the upper support member 22 is an upper spring stop or stop member as referred to in general by the reference numeral 40. The stop member 40 is formed in two parts 42 and 44 which are secured to the upper support member 22 in diametrically opposite relation. The stop member 40 is aligned with the openings between the sleeve section 28 and engages the upper end of the spring 38.

Removably carried by a lower part of the upper support member 22 in diametrically opposite relation is a pair of lower stop members 46. The lower stop members 46 are secured in place by means of bolts 38 which are threadedly engaged into internally threaded bores 50 in the upper support member 22. The upper end of each of the stop members 46 engages the lower end of the spring 38. At this time it is pointed out that the stop members 40 and 46 have their spring engaging surfaces spaced apart the same distance as are the spring seats 34 and 36.

Extending outwardly from the lower parts of the sleeve sections 28, as is best shown in Figures 3 and 6, is a pair of ears 52. The ears 52 carry a lower hanger bolt 54 which receives a lower fitting 56 of a double acting shock absorber 58. The hanger bolt 54 is also provided with a nut 60 to hold the fitting 56 in place.

Depending from the stop member 40 is an ear 62 which carries a hanger bolt 64 receiving the upper support fitting 66 of the shock absorber 58. The hanger bolt 64 is provided with a nut 68 to retain the fitting 66 in place.

It is to be understood that the moldboard support 16, as is illustrated in Figures 2 and 3, has the normal operating length of a moldboard support. This length is used when the moldboard is in a horizontal position. However, the support 16 must be extended if the moldboard is to be tilted. This aspect of the support 16 will be discussed hereinafter.

When the moldboard support 16 is used in its condition illustrated in Figures 2 and 3, should the moldboard strike a relatively immovable object, the moldboard will follow over the object by compressing the spring 38. In other words, the upper end of the upper section 22 cannot move upwardly. Therefore, it is necessary that the lower support member 18 move upwardly. As it moves upwardly, the spring seat 34 must compress the spring 38 inasmuch as the upper end of the spring 38 bears against the stop member 40. As soon as the moldboard is passed over the immovable object, the moldboard is then urged to the desired lowered position by the coil spring 38. Any tendency of the moldboard to chatter due to the operation of the spring 38 is overcome by the shock absorber 58 which dampens the action of the spring 38.

When the moldboard is raised, the entire weight of the moldboard is on the lower support member 18 and as a result the lower support member 18 tries to move downwardly with respect to the upper support member 22. The spring seat 36 then compressively engages the upper end of the spring 38. Inasmuch as the lower end of the spring 38 is seated on the lower stop members 46, downward movement of the spring 38 is prevented and the moldboard is supported in a floating state. Inasmuch as the shock absorber 58 is of the double acting type, it will also function at this time to dampen the effect of the spring 38.

Referring now to Figure 4 in particular, it will be seen that the spring 38 and the shock absorber 58 are locked out of operation. This is accomplished by the placing of a sufficient load on the moldboard to compress the spring 38 to the state where the upper end

of the lower support member 18 is disposed adjacent the upper end of the upper support member 22. At this time openings 70 in the upper end of the support member 52 become aligned with an opening 72 in the upper end of the lower support member 18. The pin 74 is passed through the aligned openings 70 and 72 so as to lock the support members 18 and 22 together.

Referring now to Figures 7 and 8 in particular, it will be seen that there is illustrated the support 16 in its extended position. The support 16 has removed therefrom the shock absorber 58 and the lower stop members 46. The lower support member 18 is now free to move out of the upper support member 22.

It is to be noted that the upper support member 22 is provided with a series of transversely aligned openings 76, 78, 80 and 82. The opening 72 in the upper end of the lower support member 18 is selectively aligned with the openings 76, 78, 80 and 82 and the pin 74 is positioned in the aligned openings. In the illustration of Figures 7 and 8, the opening 72 is aligned with the openings 82, which openings are disposed lowermost and therefore provide a moldboard support 16 which is of its greatest length. However, the pin 74 may be passed through others of the openings 76, 78 and 80 to provide intermediate lengths of the support 16. In this state the support 16 will be the same as the usual supports.

From the foregoing, it will be readily apparent that there has been devised an improved support for road grader moldboards, the support being of such a construction whereby when the moldboard is in its normal horizontal position, the connection between the moldboard and the frame of the road grader is a resilient one so that the moldboard may resiliently move upwardly against resistance and thus follow the contour of the road surface. By this arrangement the road surface may be readily cleaned of foreign materials without the tendency of the blades of the road grader digging into the road materials or being damaged by striking an immovable part of the road surface. Also, the resilient mounting of the moldboard permits the maintaining of roads at a higher speed and at the same time provides a smoother job. Further, the moldboard support may be readily extended as is necessary to tilt the moldboard.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A shock absorber type support for moldboards comprising first and second support members disposed in telescoped relation, mounting fittings on opposite ends of said support members, a sleeve telescoped over said first and second support members, means securing said sleeve to one of said support members for movement therewith relative to the other of said support members, said sleeve having a spring seat facing said mounting fitting of the other of said support members, a spring seated on said spring seat and extending towards said other support member mounting fitting, a stop member carried by said other support member and engaging said spring remote from said spring seat for transmitting a load between said first and second support members, and a shock absorber extending between said first and second support members in cooperating relation with said spring, one end of said shock absorber being secured to said stop member and the other end of said shock absorber being secured to said sleeve.

2. A shock absorber type support for moldboards comprising first and second support members disposed in telescoped relation, mounting fittings on opposite ends of said support members, a sleeve telescoped over said first

and second support members, means securing said sleeve to one of said support members for movement therewith relative to the other of said support members, said sleeve having a spring seat facing said mounting fitting of the other of said support members, a spring seated on said spring seat and extending towards said other support member mounting fitting, a stop member carried by said other support member and engaging said spring remote from said spring seat for transmitting a load between said first and second support members, said sleeve having a second spring seat remote from and opposing said first mentioned spring seat for retaining said spring at all times.

3. A shock absorber type support for moldboards comprising first and second support members disposed in telescoped relation, mounting fittings on opposite ends of said support members, a sleeve telescoped over said first and second support members, means securing said sleeve to one of said support members for movement therewith relative to the other of said support members, said sleeve having a spring seat facing said mounting fitting of the other of said support members, a spring seated on said spring seat and extending towards said other support member mounting fitting, a stop member carried by said other support member and engaging said spring remote from said spring seat for transmitting a load between said first and second support members, said sleeve having a second spring seat remote from and opposing said first mentioned spring seat for retaining said spring at all times, a second stop member carried by said other support member in opposed relation to said first stop member and said second spring seat whereby separation of said support members is resisted.

4. A shock absorber type support for moldboards comprising first and second support members disposed in telescoped relation, mounting fittings on opposite ends of said support members, a sleeve telescoped over said first and second support members, means securing said sleeve to one of said support members for movement therewith relative to the other of said support members, said sleeve having a spring seat facing said mounting fitting of the other of said support members, a spring seated on said spring seat and extending towards said other support member mounting fitting, a stop member carried by said other support member and engaging said spring remote from said spring seat for transmitting a load between said first and second support members, said sleeve having a second spring seat remote from and opposing said first mentioned spring seat for retaining said spring at all times, a second stop member carried by said other support member in opposed relation to said first stop member and said second spring seat whereby separation of said support members is resisted, the spacing of said spring seats and said stop members being substantially the same.

5. A shock absorber type support for moldboards comprising first and second support members disposed in telescoped relation, mounting fittings on opposite ends of said support members, a sleeve telescoped over said first and second support members, means securing said sleeve to one of said support members for movement therewith relative to the other of said support members, said sleeve having a spring seat facing said mounting fitting of the other of said support members, a spring seated on said spring seat and extending towards said other support member mounting fitting, a stop member carried by said other support member and engaging said spring remote from said spring seat for transmitting a load between said first and second support members, said sleeve having a second spring seat remote from and opposing said first mentioned spring seat for retaining said spring at all times, a second stop member carried by said other support member in opposed relation to said first stop member and said second spring seat whereby separation of said support members is resisted, said sleeve being longitudinally slotted for receiving said stop members.

6. A shock absorber type support for moldboards comprising first and second support members disposed in telescoped relation, mounting fittings on opposite ends of said support members, a sleeve telescoped over said first and second support members, means securing said sleeve to one of said support members for movement therewith relative to the other of said support members, said sleeve having a spring seat facing said mounting fitting of the other of said support members, a spring seated on said spring seat and extending towards said other support member mounting fitting, a stop member carried by said other support member and engaging said spring remote from said spring seat for transmitting a load between said first and second support members, said sleeve having a second spring seat remote from and opposing said first mentioned spring seat for retaining said spring at all times, a second stop member carried by said other support member in opposed relation to said first stop member and said second spring seat whereby separation of said support members is resisted, and a shock absorber extending between said first and second support members in cooperating relation with said spring.

7. A shock absorber type support for moldboards comprising first and second support members disposed in telescoped relation, mounting fittings on opposite ends of said support members, a sleeve telescoped over said first and second support members, means securing said sleeve to one of said support members for movement therewith relative to the other of said support members, said sleeve having a spring seat facing said mounting fitting of the other of said support members, a spring seated on said spring seat and extending towards said other support member mounting fitting, a stop member carried by said other support member and engaging said spring remote from said spring seat for transmitting a load between said first and second support members, said support members having selectively alignable pin openings whereby said support members may be selectively interlocked.

8. A shock absorber type support for moldboards comprising first and second support members disposed in telescoped relation, mounting fittings on opposite ends of said support members, a sleeve telescoped over said first and second support members, means securing said sleeve to one of said support members for movement therewith relative to the other of said support members, said sleeve having a spring seat facing said mounting fitting of the other of said support members, a spring seated on said spring seat and extending towards said other support member mounting fitting, a stop member carried by said other support member and engaging said spring remote from said spring seat for transmitting a load between said first and second support members, said sleeve having a second spring seat remote from and opposing said first mentioned spring seat for retaining said spring at all times, a second stop member carried by said other support member in opposed relation to said first stop member and said second spring seat whereby separation of said support member is resisted, said second stop member being removably mounted whereby said support members may be moved apart to increase the length of said support, said support members having selectively alignable pin openings whereby said support members may be selectively interlocked.

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