March 22, 1927. 1,621,695

F. J. TUITE ET AL

GRIZZLY

Filed Nov. 6, 1926 2 Sheets-Sheet 1

Fig. 1.

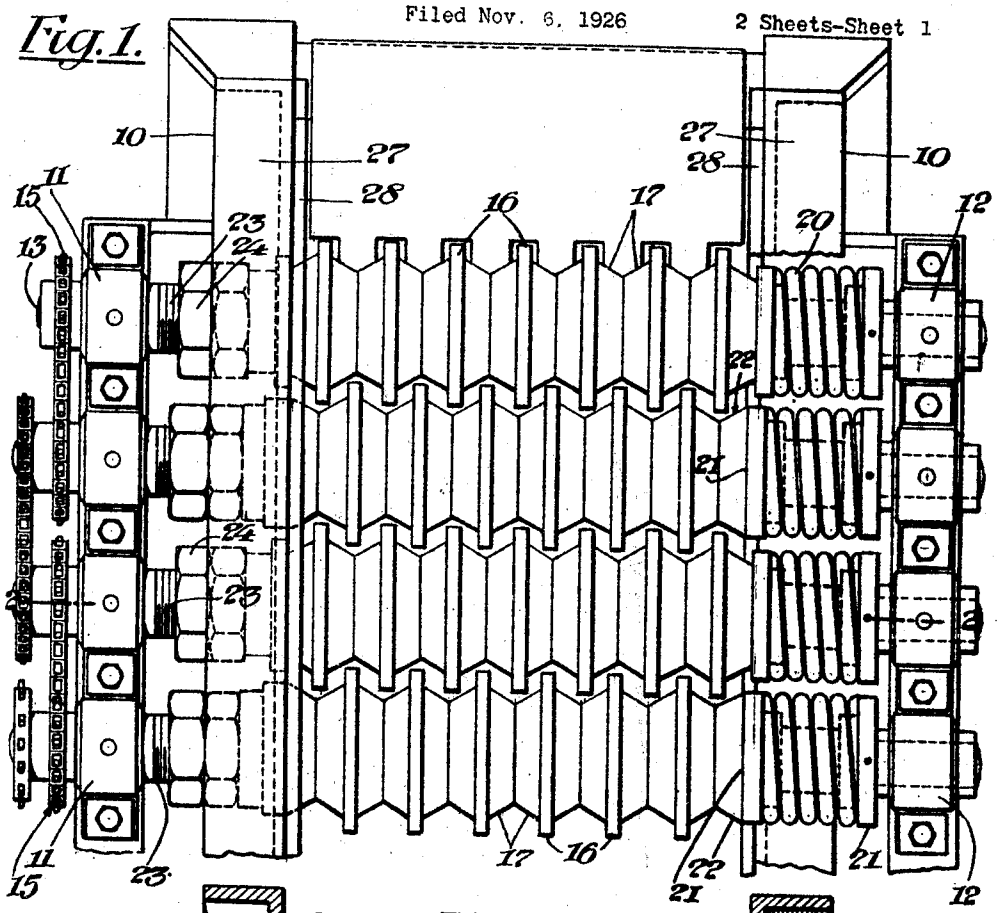


Fig. 2.

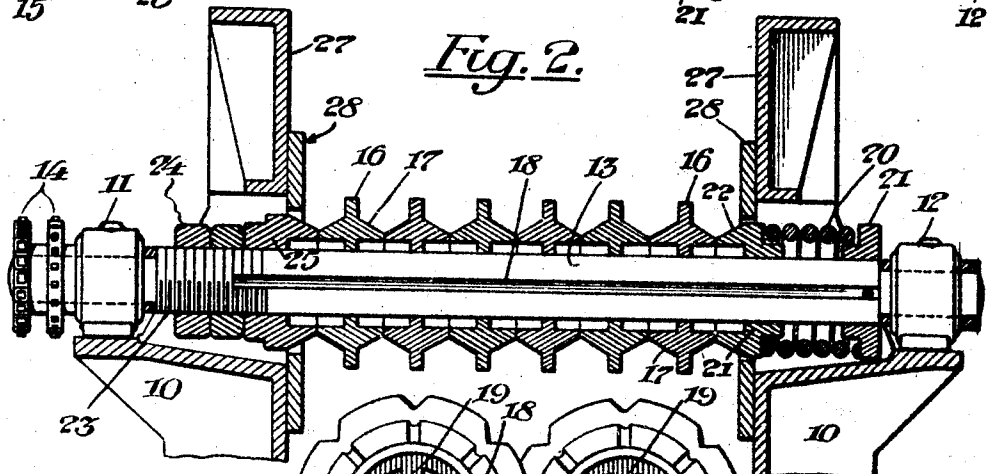
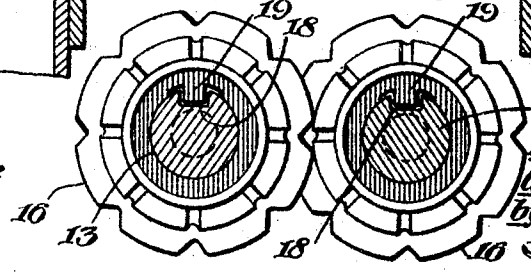


Fig. 3.



Inventors,
Frank J. Tuite
Gordon F. Dodge
by their Attorney
John F. Noeen

March 22, 1927. 1,621,695

F. J. TUITE ET AL

GRIZZLY

Filed Nov. 6, 1926 2 Sheets-Sheet 2

Fig.4.

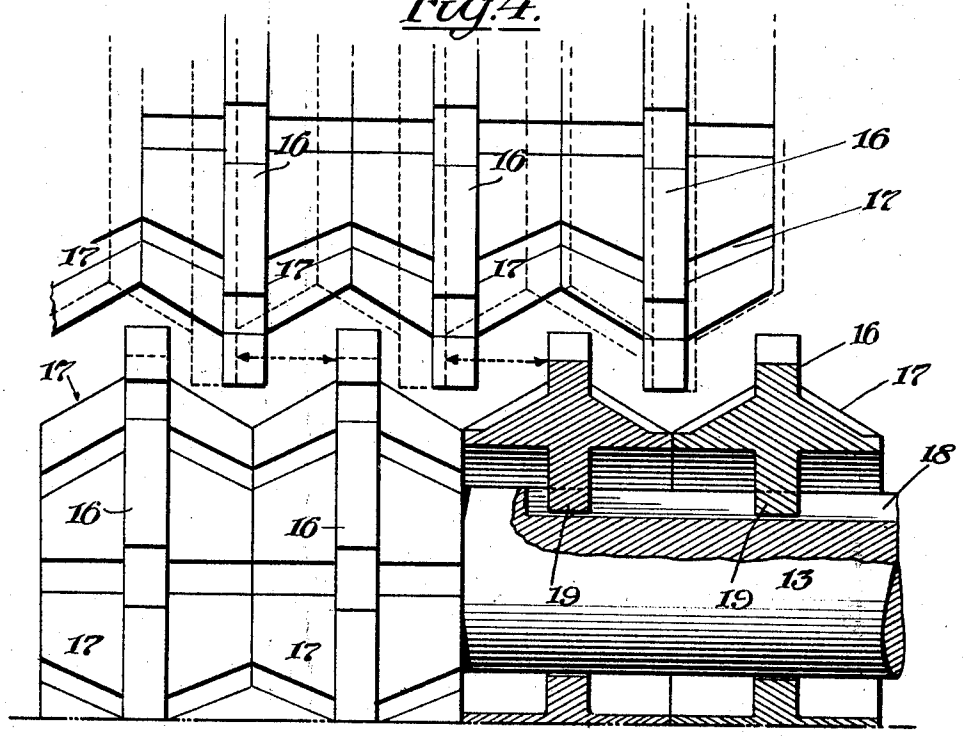


Fig.5.

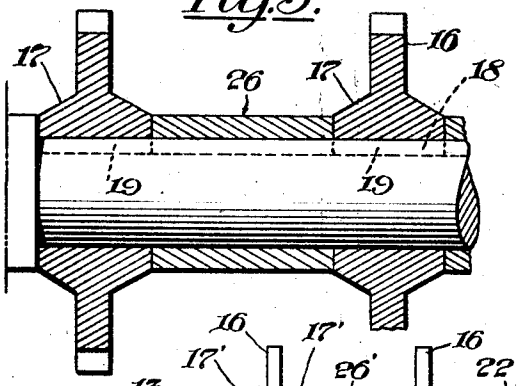


Fig.7.

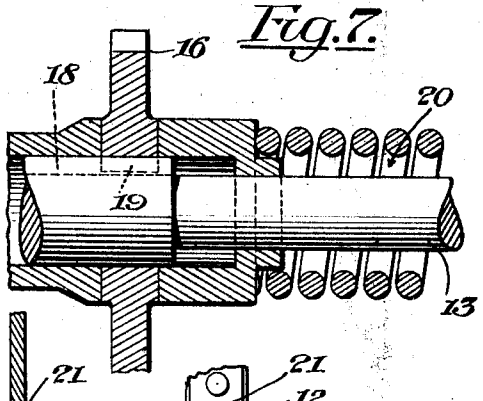
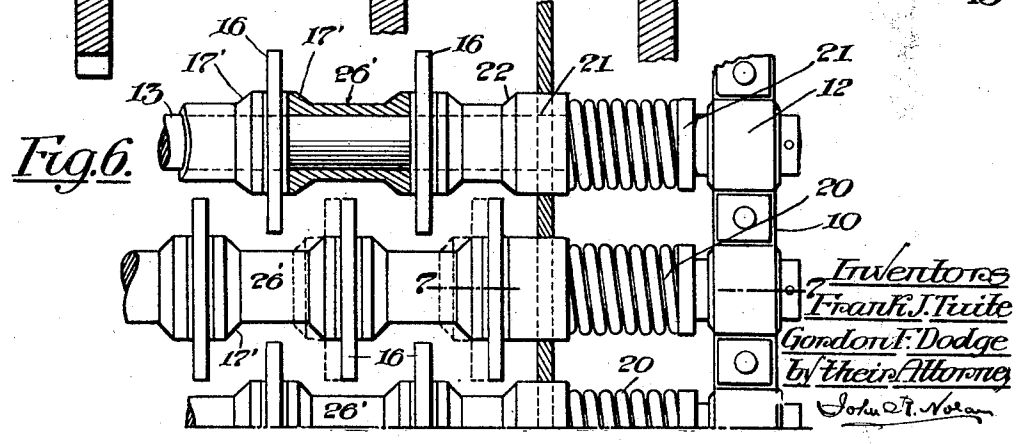


Fig.6.



Inventors
Frank J. Tuite
Gordon F. Dodge
by their Attorney
John R. Nolan

UNCERTIFIED COPY

Patented Mar. 22, 1927. 1,621,695

UNITED STATES PATENT OFFICE.

FRANK J. TUITE AND GORDON F. DODGE, OF NEW YORK, N. Y., ASSIGNORS TO ROBINS CONVEYING BELT COMPANY, OF PASSAIC, NEW JERSEY, A CORPORATION OF NEW JERSEY.

GRIZZLY.

Application filed November 6, 1926. Serial No. 146,595.

This invention relates to grizzlies for screening coal, coke and similar material, having reference especially to such apparatus wherein spaced-apart feeding and screening disks, which are mounted on concurrently driven parallel shafts, present a succession of rows of separating openings for the material to be screened.

In grizzlies, as heretofore constructed, there is no capacity or provision for the effective adjustment of adjacent co-operating disks relatively to each other for varying the size of the separating opening to provide for different definite sizes of screened product, or for taking up wear from time to time to maintain the original size of the screening opening. When the size of the opening is to be changed or when the disks are worn to an appreciable extent and it is desired to maintain a certain size of screened product, it is necessary to install an entirely new set of disks. Wherever the service is heavy in the screening of such abrasive material as coke, the life of a set of disks for a screened product of given size is often as short as a week or ten days.

The object of our invention is to provide a grizzly having its separating elements so constructed and arranged as to permit of their relative adjustment to vary the size of the screen openings within a relatively wide range, and also to permit adjustment of the disks to compensate for their reduction by wear, thus rendering it possible to provide for and maintain a predetermined maximum size of product and also to prolong the active life of the disks.

According to our invention the screening elements on the respective shafts are constituted by co-operating disks and spacing members, which members are in whole or in part of tapering or conical formation and are so arranged in relation to each other and to the associated disks that the longitudinal adjustment of the screening elements on alternate shafts effects their adjustment in relation to the corresponding elements of the respective adjacent shafts in such a manner as to vary the effective area of the separating openings either for screen sizing or to compensate for wear. In the present form of embodiment of our invention the screening elements of each shaft are slidably mounted thereon, and oppositely-acting spring and nut devices are so co-operatively arranged at the respective ends of the shaft that when the nuts are properly manipulated the requisite adjustment of the screening elements is accomplished.

The invention also comprises features of construction and combinations of parts, all of which will be hereinafter described and claimed.

In the drawings—

Figure 1 is a plan of a portion of a grizzly embodying our invention.

Fig. 2 is a transverse vertical section of the same, as on the line 2—2 of Fig. 1.

Fig. 3 is a cross-section through a pair of adjacent shafts and their associated disks and tapering hubs.

Fig. 4 is an enlarged plan, partly in section, of adjacent rows of the disks and adjuncts, showing the adjustability of one set of disks and their hubs in relation to the other set in order to vary the size of the screen opening.

Fig. 5 is a section of a modified construction wherein the disks are provided with tapered hubs between which is a cylindrical spacer.

Fig. 6 is a plan, partly in section, of another modification wherein spool-shaped spacers are interposed between adjacent disks on each shaft.

Fig. 7 is a partial section as on the line 7—7 of Fig. 6.

Referring to Figs. 1 to 4, inclusive, of the drawings, 10 designates a supporting frame provided at its respective sides with boxes, 11, 12 in which are journaled a series of transverse shafts 13. These shafts are arranged in spaced parallel relation, their ends at one side of the frame being outwardly extended and there provided with suitable means for simultaneously and continuously driving the shafts in the same direction when one of the shafts is actuated from a suitable source of power. For example, the shafts are equipped with sprocket wheels 14 which are successively connected by chains 15 in a well-known manner.

Each of the shafts 13 is provided with a plurality of feeding and screening elements comprising disks 16, preferably peripherally toothed or notched, having tapering hubs 17, the whole being mounted on the shaft so as to rotate with, yet have capacity for movement longitudinally of the shaft. In the present case the shaft has a longitudinal

key-way 18, and each of the disks thereon has a key 19 slidably fitted in the key-way. The hubs on the respective sides of each disk are reversely tapered as shown, so that when a plurality of disks are successively assembled on a shaft, the contiguous hubs of adjacent disks converge toward each other to afford, in effect, an annular recess of V-shape cross-section. The disks of adjacent shafts are mounted thereon in staggered relation, so as to extend into the annular recesses formed by the tapering hubs on the respective shafts, as shown, thus providing efficient screening openings between the opposing faces and the tapering hubs of the cooperating disks.

In the present instance the hubs of the succeeding disks on each shaft are held yieldingly in contact with each other by means of a spring 20 which encircles the shaft adjacent the box 12. This spring bears against a suitably-disposed collar 21 fast on the shaft and against a tapering head 22 which abuts against the opposing hub of the adjacent disk and co-acts therewith to afford an annular recess. The shaft is threaded, as at 23, adjacent its opposite end, and is there provided with nuts 24 which are screwed against a head 25 (similar to 22) that bears against the adjacent disk hub. By this construction it will be seen that by manipulating the nuts 24 of any shaft, the respective disks and hubs on such shaft are simultaneously adjusted longitudinally of the shaft, in either direction, and their spacing relation in respect to the disks and hubs of the adjacent shaft is varied accordingly. In other words, the relation of the peripheries of the disks on any shaft to the apices of the respective hub recesses of the adjacent shaft determines the effective size of the screening openings. Hence, if the disks of any shaft be set in alignment with or centrally of the companion recesses of the hubs of the adjacent shaft, screen openings of uniform area will be provided, but if the disks be shifted to a greater or less extent laterally of the apices of the recesses, alternate uniform large and uniform small screening openings will be provided between the disks and hubs of the adjacent shafts; the larger openings determining the maximum size of the screened product, whereof the finer particles will escape through the smaller openings as well as the larger openings.

It is to be noted that the parallelism of the opposing inclined surfaces of the hubs on the adjacent shafts, together with the described location of the disks in respect thereto, permit the screening area of the openings to be nicely determined for a given product, by the act of adjusting the disks and hubs on one shaft in relation to those on the adjacent shaft as previously described, since the inclined surfaces of one set of disk hubs uniformly recede from or approach the adjacent oppositely inclined surfaces of the respective hubs of the other set, and at the same time corresponding variation of the spaces between the opposing faces of the adjacent disks on the shafts is attained. (See Fig. 4.) Consequently adjustment of the openings throughout the apparatus, either for varying the effective size of the opening for screening purposes or for compensating for wear of the disks can be readily attained by turning up on the nuts of alternate shafts while the other shafts remain undisturbed.

In the hereinbefore described means for effecting the adjustment of the disks, the springs 20 not only hold the disk hubs close together and maintain a yielding tension thereon, but they render it unnecessary to make adjustment of the nuts except at one side of the grizzly. Moreover, the use of the spring tension reduces the cost of construction since the springs and their set collars 21 are less expensive than the operation of threading the shafts and applying nuts thereto to retain the disks and their hubs in their various positions of adjustment.

In Fig. 5 we have shown a modification wherein the disks 16 on each shaft are formed with tapered hubs 17 on their respective sides, and cylindrical spacers 26 are interposed between the opposing hubs of the adjacent disks; the whole being adjustably mounted on the shaft as and for the purposes previously stated.

In Figs. 6 and 7 we have shown another modification wherein spool-shaped spacers 26′ are interposed between the adjacent disks 16 on each shaft, the inclined or beveled surfaces 17′ of the end heads of the spacers on each shaft co-operating with the oppositely inclined or beveled surfaces of the spacers on the adjacent shaft, which opposing surfaces in conjunction with the opposing faces of the companion disks on the adjacent shafts, determine the effective area of the screening openings; the whole being adjustable in relation to each other as in the first described construction.

From the foregoing it will be seen that our invention comprehends a grizzly characterized by the employment of screening and separating elements which are adjustable longitudinally of the respective shafts, said elements comprising disks which are associated with tapering hubs or spacing members so relatively formed and arranged that the opposing tapering surfaces of such hubs or spacing members on adjacent shafts, together with the opposing faces of the companion disks on said shafts, define the effective area of the screening openings, which area may be readily adjusted, as occasion

may require, for the purpose of changing the size of the product passed through the openings or for maintaining the size of the product as the disks are reduced by wear.

27 designates skirt plates for retaining the material on the screening surface, and 28 designates renewable wearing plates which protect the skirt plates, said plates 27 and 28 being removably attached to the respective sides of the supporting frame 10 in the usual manner.

It is to be understood that our invention is not limited to the particular construction or constructions herein disclosed, as the same may be modified within the principle of the invention and the scope of the appended claims.

We claim—

1. In a grizzly, the combination with a supporting frame, a plurality of spaced-apart parallel shafts, and means for actuating said shafts, of a series of material feeding and separating elements mounted on each of said shafts so as to be rotatable with, and also adjustable longitudinally of the shaft, said elements comprising spaced-apart disks and converging tapering members between adjacent disks, the series of disks of adjacent shafts being in staggered relation and extending into the spaces between the disks of the respective shafts, whereby the opposing faces of the co-operating disks on adjacent shafts and the inclined surfaces of the associated complemental tapering members on said shafts define the effective area of the screening openings, and means for effecting relative adjustment between the two co-operating series of disks and tapering members on adjacent shafts.

2. In a grizzly, the combination with a supporting frame, a plurality of spaced-apart parallel shafts, and means for actuating said shafts, of a series of material feeding and separating elements mounted on each of said shafts so as to be rotatable with, and also adjustable longitudinally of the shaft, said elements comprising spaced-apart disks and converging tapering members between adjacent disks, the series of disks of adjacent shafts being in staggered relation and extending into the spaces between the disks of the respective shafts, whereby the opposing faces of the co-operating disks on adjacent shafts and the inclined surfaces of the associated complemental tapering members on said shafts define the effective area of the screening openings, spring means at one end of each shaft outside the screening area arranged to press together all the said elements on the shaft, and adjusting means at the opposite end of each shaft arranged to press together all the elements on the shaft in opposition to the action of the spring.

3. In a grizzly, the combination with a supporting frame, a plurality of spaced-apart parallel shafts, and means for actuating said shafts, of a series of material feeding and separating elements mounted on each of said shafts so as to be rotatable with, and also adjustable longitudinally of the shaft, said elements comprising disks having tapering hubs which afford between the adjacent disks of each shaft annular recesses of V-shape cross-section, the series of disks of adjacent shafts being in staggered relation and extending into the recesses between the disks of the respective shafts, and means for effecting relative adjustment of the co-operating series of disks of adjacent shafts.

4. In a grizzly, the combination with a supporting frame, a plurality of spaced-apart parallel shafts, and means for actuating said shafts, of a series of material feeding and separating elements mounted on each of said shafts so as to be rotatable with, and also adjustable longitudinally of the shaft, said elements comprising disks having tapering hubs which afford between the adjacent disks of each shaft annular recesses of V-shape cross-section, the series of disks of adjacent shafts being in staggered relation and extending into the recesses between the disks of the respective shafts, spring means at one end of each shaft effective to press together all the elements on the shaft, and adjusting means at the opposite end of each shaft operable to press together all the elements on the shaft in opposition to the action of the spring.

FRANK J. TUITE.
GORDON F. DODGE.