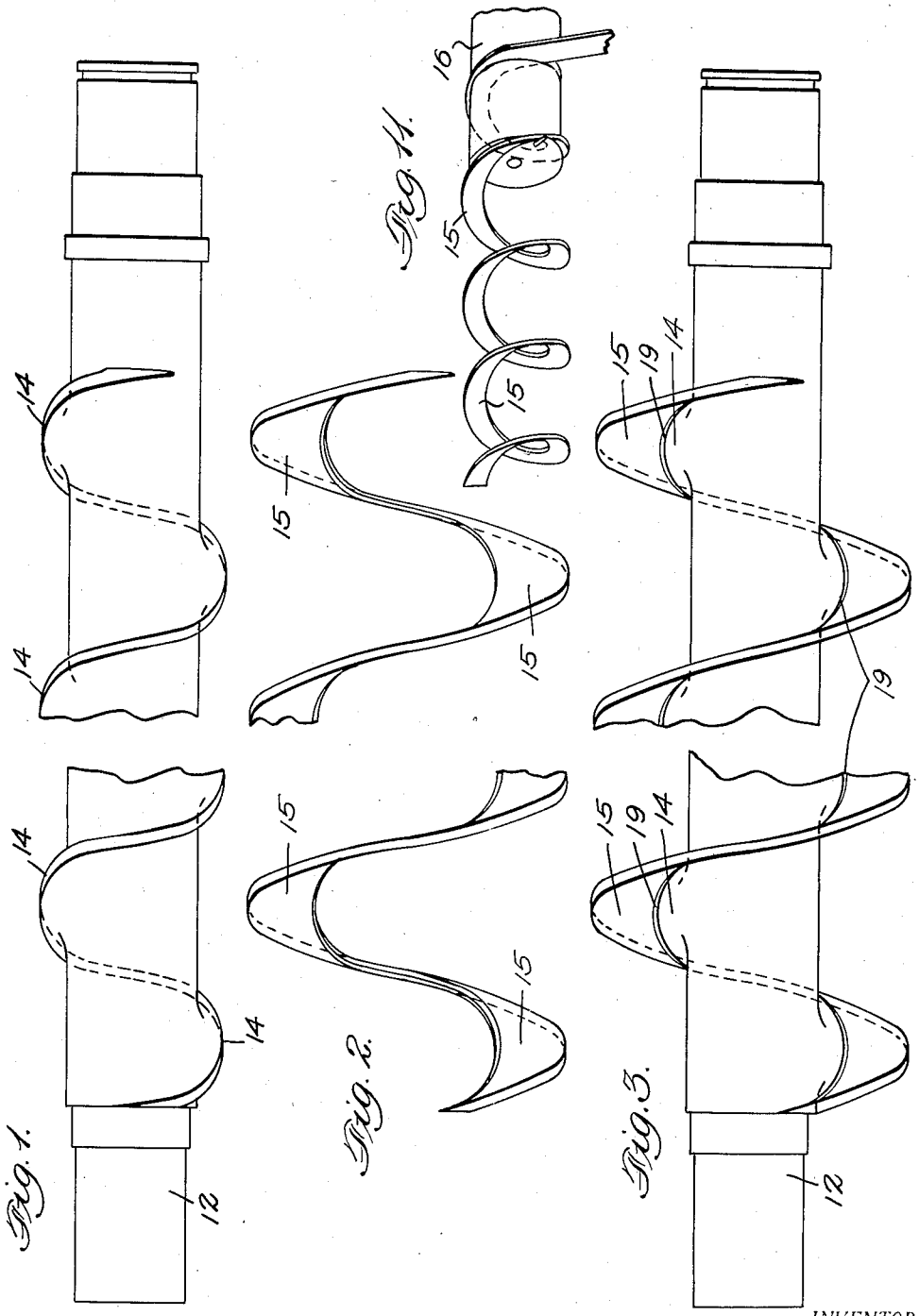
Aug. 11, 1931. F. R. McFARLAND 1,818,492

METHOD OF MAKING CONVEYER AND ELEVATOR SCREWS

Filed June 8, 1928 2 Sheets-Sheet 1



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METHOD OF MAKING CONVEYER AND ELEVATOR SCREWS

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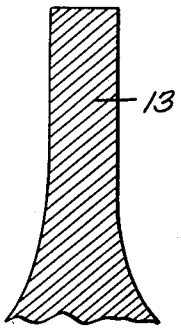


Fig. 4.

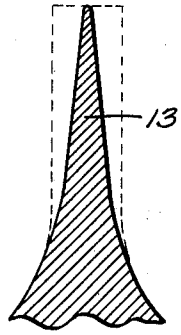


Fig. 5.

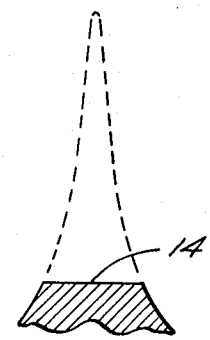


Fig. 6.

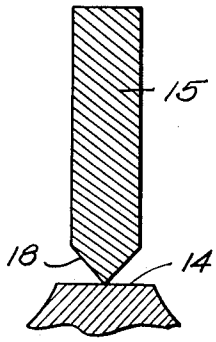


Fig. 7.

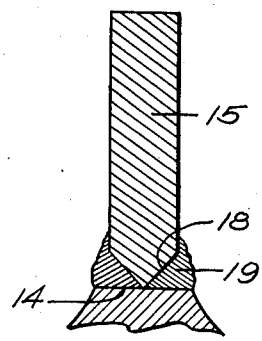


Fig. 8.

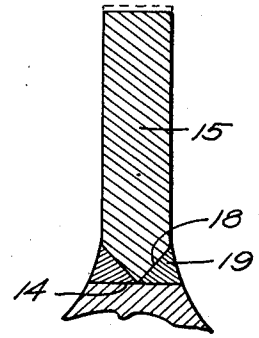


Fig. 9.

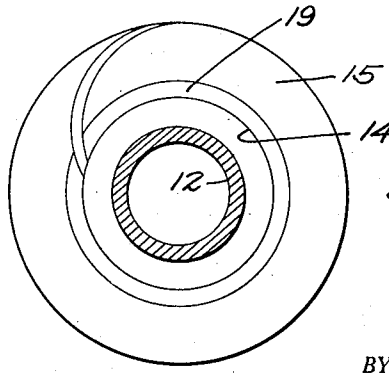


Fig. 10.

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UNITED STATES PATENT OFFICE

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METHOD OF MAKING CONVEYER AND ELEVATOR SCREWS

Application filed June 8, 1928. Serial No. 283,777.

My invention relates to elevator and conveyer screws for all types of stokers, both for steam locomotives and other types of service, such as stationary plants, coal mines, pulp paper mills, etc.

My invention consists of an improved method of making and reclaiming such elevator and conveyer screws.

In screws of this class, especially those handling coal and other gritty substances, it has been found that the blades or flights of the screw wear, or are ground off both in height and in thickness, and the substance conveyed rolls back between the edges of the flights and the casing or trough in which they are mounted. Again, the flights when ground to a reduced thickness become very weak and will break or bend under the stress of the load conveyed, which results in an inefficient and reduced feed.

In connection with locomotives, it is the practice of railroads to keep quite a stock of new stoker screw feeds, and to "scrap" the worn and damaged stoker screws, and when it is considered that a new elevator screw costs approximately $75.00 and a conveyer screw $100.00, and that on a railroad having 875 stoker fired locomotives the yearly average consumption of these screws is 85 elevator screws and 163 conveyer screws, at a cost of $21,597.00, whereas, by the use of my method these worn screws can be reclaimed at an average of $6.67 apiece, from which it will be seen that a very material saving results from the practice of my invention, as has been shown by actual commercial use of my invention.

In the drawings:

Figure 1 is a side elevation of a screw as it appears after the first step of my method has been performed.

Figure 2 is a detail view of portions of the flight ready for application to Figure 1.

Figure 3 is a side elevation of a screw showing the flights applied to Figure 1.

Figure 4 is a detail sectional view of the flight of a screw according to the old practice cast integral with the stem.

Figure 5 is a similar view showing in full lines the shape to which the flight in Figure 4 is worn.

Figure 6 is a detail view illustrating the first step of my method showing the flight in Figure 5 cut off to the front shown.

Figure 7 is a detail view showing the assembly of the new flight to Figure 6.

Figure 8 is a view similar to Figure 7 showing the next step in my method, which is the electric welding of the new flight.

Figure 9 is a view similar to Figure 8 showing the finished product.

Figure 10 is an end elevation of the completed screw.

Figure 11 is a perspective view of my new flight in the process of formation.

The reference numeral 12 designates the stem of a conveyer screw to which the flight 13, according to the old process is cast integrally. Experience has shown that the integral flights gradually wear away as shown in full lines in Figure 5 to a tapered body (the dotted lines in this figure indicating the original thickness of the flight). When this condition exists the flight is very susceptible to bending or fracture, therefore, according to the old practice a screw in the condition shown in Figure 5 is scrapped and becomes a total loss, the cost of which is stated above. It is necessary for a railroad to carry, at all times, a stock of new screws in order to promptly substitute the new screw for the old.

According to my invention these screws may be reclaimed at a very nominal cost, which results in a material annual saving as herein related.

According to my invention, when a screw is worn, as shown in Figure 5, this worn screw is put in a machine and the worn flight is cut off to the point 14, Figure 6, or it may be removed by acetylene torch. The next step is to place a metal strip (constituting the new flight 15) in a machine 16 and coil it to the required pitch of the flight as shown in Figure 11. It will be seen that the machine 16 is provided with grooves into which the metal strip 15 is introduced and that these grooves are pitched to bend the strip 15 to the desired pitch and coil, the flight being continuous in

one piece for the screw. The inner edge of the strip 15 is provided with a double bevel point or edge 18.

After the flight 15 is thus formed, it is assembled on the stem 12, Figures 1 and 7, with the bevel edge 18 resting on the surface 14. The next step is to apply the electric welding metal 19 in the welding recesses and securing the flight 15 to the stem 12, after which the surplus metal of the weld is removed as shown in Figure 9, thereby completing the screw as shown in Figure 3.

New screws may be originally constructed according to my invention as will be obvious to those skilled in the art, thereby eliminating large expensive steel castings that are difficult to cast, and at the same time produce a better screw for the purpose, because the stem may be made from simple molds and of cast or drawn malleable metal strips, with the flights of, for instance, open hearth steel, which materially increases the life of the screw. The time necessary for reclaiming a worn screw is not over four hours.

It is not necessary that the flight be one continuous piece as it can be put on in sections which would be more convenient in the case of a very long screw, and the sections welded together, when in place, making it a continuous flight.

What I claim is:

1. The method of making elevator and conveyer screws which consists in casting the stem with stub flights, then welding a full flight of malleable metal to said stub flights.

2. The method of reclaiming elevator and conveyer screws which consists of cutting the worn flights down to stubs, then assembling a full flight of malleable metal on said stubs, and then welding said full flights to said stubs.

3. The method of reclaiming elevator and conveyer screws, which consists in cutting the worn flights down to stubs, coiling a metal strip to form a flight of the required pitch, fitting the flight strip about the conveyer stem and upon said stubs, and then welding the strip to the stubs.

4. The method of reclaiming elevator and conveyer screws, which consists in cutting the worn flights down to stubs, coiling a metal strip having a V-shaped edge so as to form a flight strip of the required pitch, assembling said flight strip about the conveyer stem with its V-shaped edge bearing on the stubs so as to form recesses at each side of the strip and between the same and each stub, and then depositing welding metal in said recesses so as to weld the strip to the stubs.

5. The method of reclaiming elevator and conveyer screws, which consists in cutting the worn flights down to stubs, coiling a metal strip to form a flight of the required pitch, fitting the flight strip about the conveyer stem and upon said stubs, then welding the strip to the stubs, and then shaping the deposited metal to the design of the flights.

6. The method of reclaiming elevator and conveyer screws, which consists in cutting the worn flights down to stubs, coiling a metal strip having a V-shaped edge so as to form a flight strip of the required pitch, assembling said flight strip about the conveyer stem with its V-shaped edge bearing on the stubs so as to form recesses at each side of the strip and between the same and the stubs, then depositing welding metal in said recesses so as to weld the strip to the stub, and then shaping the deposited metal to the design of the flights.

7. The method of making elevator and conveyer screws, which consists in casting a conveyer stem with stub flights, coiling a metal strip to provide a flight of the required pitch and formed to fit the stub flights, disposing the flight strip upon the stub flights on the conveyer stem, and then welding the strip to the stub flights.

8. The method of making elevator and conveyer screws, which consists in casting a conveyer stem with stub flights, coiling a metal strip having a V-shaped edge so as to form a flight strip of the required pitch, assembling said flight strip about the conveyer stem with its V-shaped edge bearing on the stubs so as to form recesses at each side of the strip and between the same and each stub, and then depositing welding metal in said recesses so as to weld the strip to the stubs.

9. The method of making elevator and conveyer screws, which consists in casting a conveyer stem with stub flights, coiling a metal strip to form a flight of the required pitch, assembling the flight strip upon the conveyer stem, then welding the strip to the stubs, and then shaping the deposited metal to the design of the flight.

10. The method of making elevator and conveyer screws, which consists in casting a conveyer stem with stub flights, coiling a metal strip having a V-shaped edge so as to form a flight strip of the required pitch, assembling said flight strip about the conveyer stem with its V-shaped edge bearing on the stubs so as to form recesses at each side of the strip and between the same and the stubs, then depositing welding metal in said recesses so as to weld the strip to the stub, and then shaping the deposited metal to the design of the flight.

11. The method of reclaiming elevator and conveyer screws, which consists in cutting off the worn flights down to stub flights, securing one end of a malleable metal strip to a helically grooved rotating mandrel, winding said strip in the groove of the mandrel while simultaneously guiding and bending said strip into shape, so as to produce a helically formed full flight of the same pitch and internal diameter conforming to the external di-

ameter of the stub flight of the stem, fitting said full flight on the stub flight of the stem, and welding the same thereto.

12. The method of producing an elevator and conveyer screw, which consists in providing a cast metal stem having helically arranged stub flights cast integrally therewith, securing at one end to a rotating helically grooved mandrel a malleable metal strip, winding said strip in the groove of the mandrel while guiding said strip and bending it to conform to the shape of the mandrel groove, so as to form a full flight strip corresponding in pitch to and of an internal diameter conforming to the external pitch of the stub flights, removing said helical strip from the mandrel and disposing the same about the stub flights of the stem, and then welding said strip to the stub flights.

13. The method of reclaiming elevator and conveyer screws, which consists in producing an electric arc, burning away the worn flights of the conveyer down to stub flights by means of such arc, forming a malleable metal helical full flight of the same pitch as the stub flights and of an internal diameter corresponding to the external diameter of the stub flights, fitting said strip upon the stem and about said stub flights, and welding said strip to said stub flights.

In testimony whereof I affix my signature.

FRANK R. McFARLAND.