

No. 722,960.

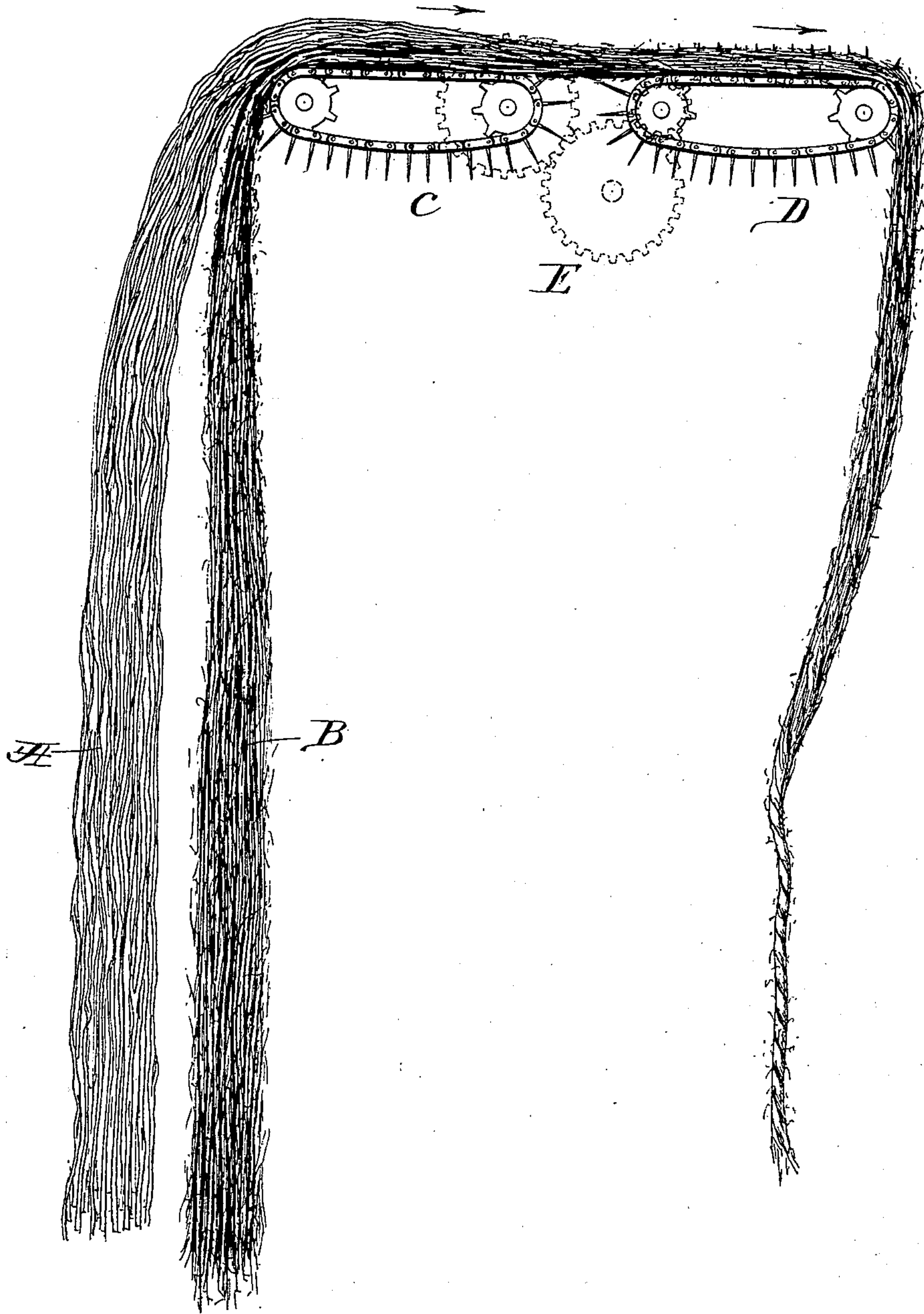
PATENTED MAR. 17, 1903.

G. H. ELLIS.

TWINE.

APPLICATION FILED APR. 19, 1902.

NO MODEL.



Witnesses;
Edward Barrett
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UNITED STATES PATENT OFFICE.

GEORGE H. ELLIS, OF CHICAGO, ILLINOIS, ASSIGNOR TO DEERING HARVESTER COMPANY, OF CHICAGO, ILLINOIS.

TWINE.

SPECIFICATION forming part of Letters Patent No. 722,960, dated March 17, 1903.

Application filed April 19, 1902. Serial No. 103,699. (No specimens.)

To all whom it may concern:

Be it known that I, GEORGE H. ELLIS, of Chicago, in the county of Cook and State of Illinois, have invented a Twine, of which the following is a full description, reference being had to the accompanying drawing, which illustrates the process of manufacture.

The object of my invention is more particularly to produce a successful cheap twine for binding grain and similar uses, somewhat coarse and preferably of a single strand.

I have discovered that it is practicable to spin flax or other soft fibers mixed with sisal, manila, or other hard fibers and also that the process of spinning hard fibers is much facilitated by mixing therewith the soft fibers referred to, and, further, that a twine composed of flax or other soft fiber is rendered better by the addition of the hard fibers referred to. I have also discovered that hard fiber when mixed with soft fiber may be spun on soft-fiber-spinning machinery—as, for instance, the machines manufactured by Comb, Barbour & Comb, of Belfast, Ireland.

I have attempted to make single-strand twine for binding grain and similar purposes of retted and carded flax alone, but found so much waste on account of the fiber being worked into tow as to render the manufacture of such twine unprofitable, and also in the operation of machines for the purpose there is too great a tendency to produce little bunches of fibers, known as “witches,” all of which are practically fatal to the successful manufacture of binding-twine.

A choice may be made between soft fibers—as, for instance, between flax, hemp, and others—and also a choice between hard fibers adapted to be mixed with the soft fibers. Sisal fiber may be availed of in the manufacture of the twine I am about to describe. It is desirable to have the proportions of the soft-fiber machinery adapted to handling fibers longer than flax, to which, as now put on the market, they are generally adapted. It is not necessary that the flax fiber be either retted, hackled, or carded in order to produce my improved twine. In fact, I have so far met with better results in making my new twine of unretted or only partially-retted flax, because of the fact that in spinning unretted

fiber witches are avoided to a greater extent than otherwise.

It is understood that where the terms “retting,” “hackling,” and “carding” are used they apply to those well-known steps that are taken to reduce the cortices of exogenous plants to fibers of fineness preparatory to spinning. It may be added that these well-known steps referred to and, as stated, being the ones usually employed in preparing the fiber will reduce the fiber to a degree of fineness such as to partially or entirely unfit it for my purpose—viz., that of mixing it and spinning it with hard fibers, such as sisal and manila.

My twine, then, consists not merely in a mixture of hard and soft fibers, but may be considered in the nature of a combination of hard and soft fibers, by which the spinning of soft fibers is facilitated and improved, and the spinning of the hard fibers with the soft fibers renders a softer twine than produced from hard fibers and one more uniform than a twine where the soft fiber alone is used. The functions, then, of the hard fibers and of the soft fibers are so modified by being associated with the other that a sliver of medium softness can be produced, and consequently a twine of medium softness, which is desirable, particularly when used for binding grain, as such twine has neither the objection of soft-fiber twine nor twine made from hard fiber.

In the manufacture of my twine I take flax, preferably unretted, form it into a sliver, preferably as shown and described in Letters Patent of the United States, granted to me, No. 679,695, dated July 30, 1901, and also form a sliver of a hard fiber by any of the ordinary machinery used in preparing such hard fibers for spinning. My various experiments have shown that a good twine may be produced by running a sliver of the hard fiber and one of the soft fiber together in a proportion as low as one of hard fiber to seven of soft. Even this small proportion of the hard fiber is sufficient to produce a twine of good quality for binding grain; but any proportions may be resorted to consistent with cheapness and efficiency and the particular purpose for which special twines may be desired.

In the drawing, A represents a sliver, preferably, as stated, of unretted flax fiber, and

B a sliver of hard fiber, which in this instance may be considered to be sisal.

C represents one of the gill-chains of a drawing-frame, and D another portion of the same, the latter speeded much higher than the former by means of the gearing E. The chains moving in the direction indicated by the arrow receive the hard and soft slivers and by the usual process of drawing mix them. In the manufacture of my twine it is desirable to draw the slivers several times in order to produce a more level twine—that is, one uniform in size and strength; but for my present purpose I deem it sufficient to show but one pair of gill-chains, as the mixed slivers may be run over the same gill-chains several times.

I am aware that twine has been produced by spinning a hard fiber around an already-spun twine of soft yarn, forming a core; but I am not aware that twine of the kind I have described above has ever been produced. The spinning is particularly facilitated by the presence of the hard fiber, because of the fact that there is much less tendency for the soft fiber to wind on the rollers of the preparing machinery.

I prefer to use flax fiber in order to utilize the waste product of the great West, where flax is raised for seed, which fiber is usually quite short, and my invention is advantageous to a certain extent, because in mixing with such short fibers a long fiber which may serve to bind those fibers together I produce a twine that, in effect, may have strength and other qualities of a twine made wholly of long fibers. On the other hand, it is well known that strength alone is not all required, particularly in binding grain, but that the size of the strand is an essential matter to consider and as well a certain degree of softness. My invention may be considered, then, in a measure also to consist in mixing with hard fibers soft fibers, which shall not only add softness to the twine, but aid in increasing the size to adapt it better to be handled by the holding and knotting devices of an automatic binder and also to increase the size of the knot where the inefficiency of twine due to its smallness in binding grain shows itself. This will be understood when it is explained that a very small twine of sisal, if uniform, will have suf-

ficient strength to be handled by an automatic binder; but the various turns will tend to cut each other, where they are formed in a knot, to such an extent that they will also break where bent shortly, as in a knot. I have found that the less preparation made of the soft fibers before mingling them with the hard fibers the better are the results. For instance, the mere cortices, as described in the patent granted to me, hereinbefore cited, produce better results than if either carded or hackled, or both. If the straws are retted or only partly retted, but uncarded and even unhackled, a good twine may be made when mixed with the hard fibers. By "mixture" it is not meant the twisting of strands of soft fiber with strands of hard fiber, but mixing the sliver of each before spinning, and thus making up the strand or strands.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A twine for binding grain and for similar purposes, consisting of a mixture of uncarded and unhackled soft fiber, as flax, hemp, &c., and a hard fiber, as manila, sisal, &c., mixed and twisted, substantially as described.
2. A single strand of twine for binding grain and for similar purposes, consisting of a mixture of uncarded and unhackled soft fiber, as flax, hemp, &c., and a hard fiber, as manila, sisal, &c., mixed and twisted, substantially as described.
3. A twine for binding grain and for similar purposes, consisting of a mixture of an unretted soft fiber, as flax, hemp, &c., and a hard fiber, as sisal, substantially as described.
4. A twine for binding grain and for similar purposes, consisting of a mixture of unretted and uncarded soft fiber, as flax, hemp, &c., and a hard fiber, as manila, sisal, &c., substantially as described.
5. A twine for binding grain and for similar purposes, consisting of a mixture of unretted, uncarded and unhackled soft fiber, as flax, hemp, &c., and a hard fiber, as sisal, manila, &c., substantially as described.

GEORGE H. ELLIS.

In presence of—

EDWARD R. BARRETT,
J. C. WARNES.

It is hereby certified that in Letters Patent No. 722,960, granted March 17, 1903, upon the application of George H. Ellis, of Chicago, Illinois, for an improvement in "Twine," an error appears in the printed specification requiring correction, as follows: In line 80, page 2, the word "of" should be stricken out; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 2nd day of March, A. D., 1909.

[SEAL.]

C. C. BILLINGS,
Acting Commissioner of Patents.