No. 774,894. PATENTED NOV. 15, 1904.

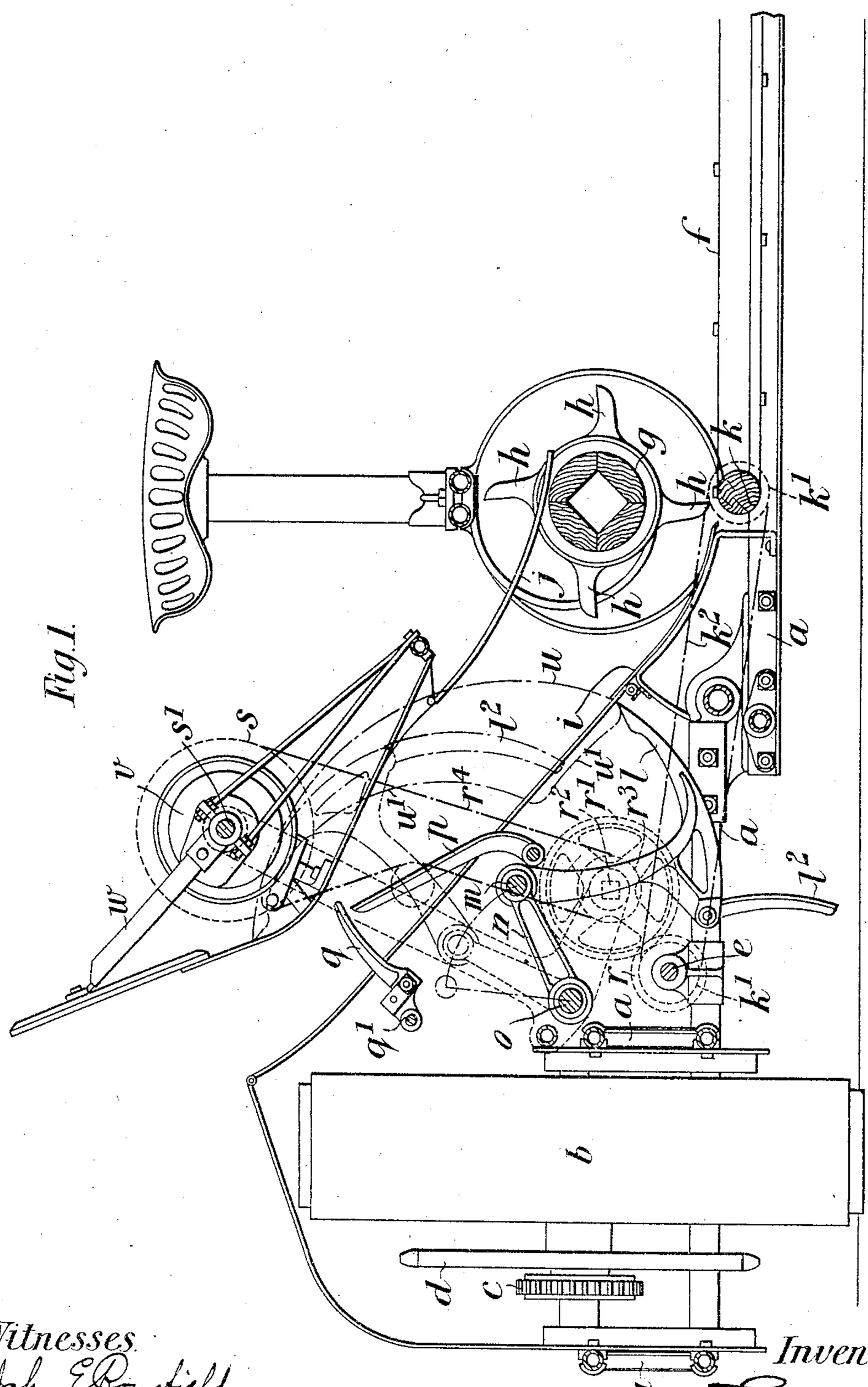
D. ROBERTS & J. LOWSON.

SHEAF BINDING OR TRUSSING MECHANISM.

APPLICATION FILED SEPT. 29, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.



Witnesses.
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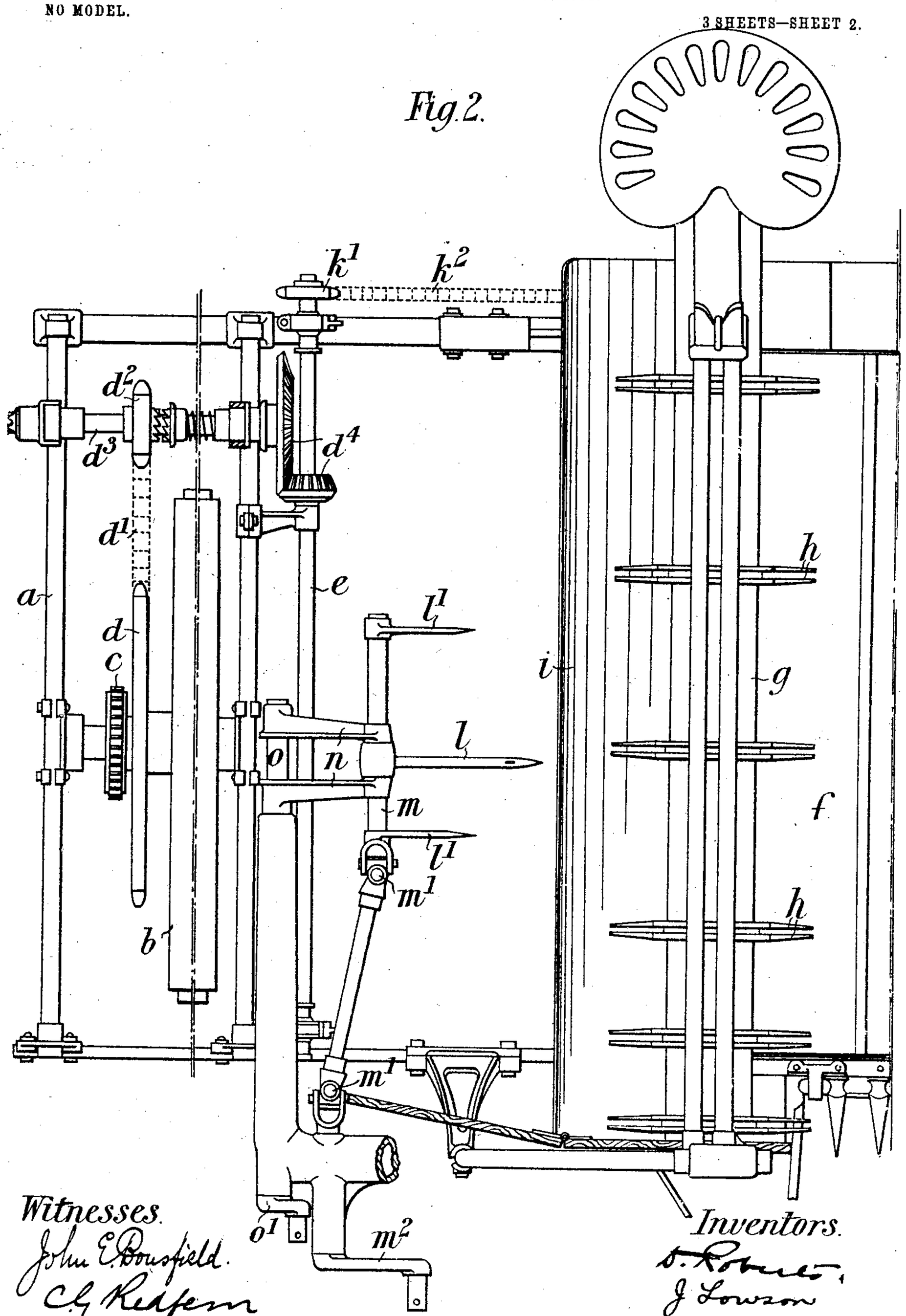
NO MODEL. 3 SHEETS—SHEET 2.

Fig. 2.



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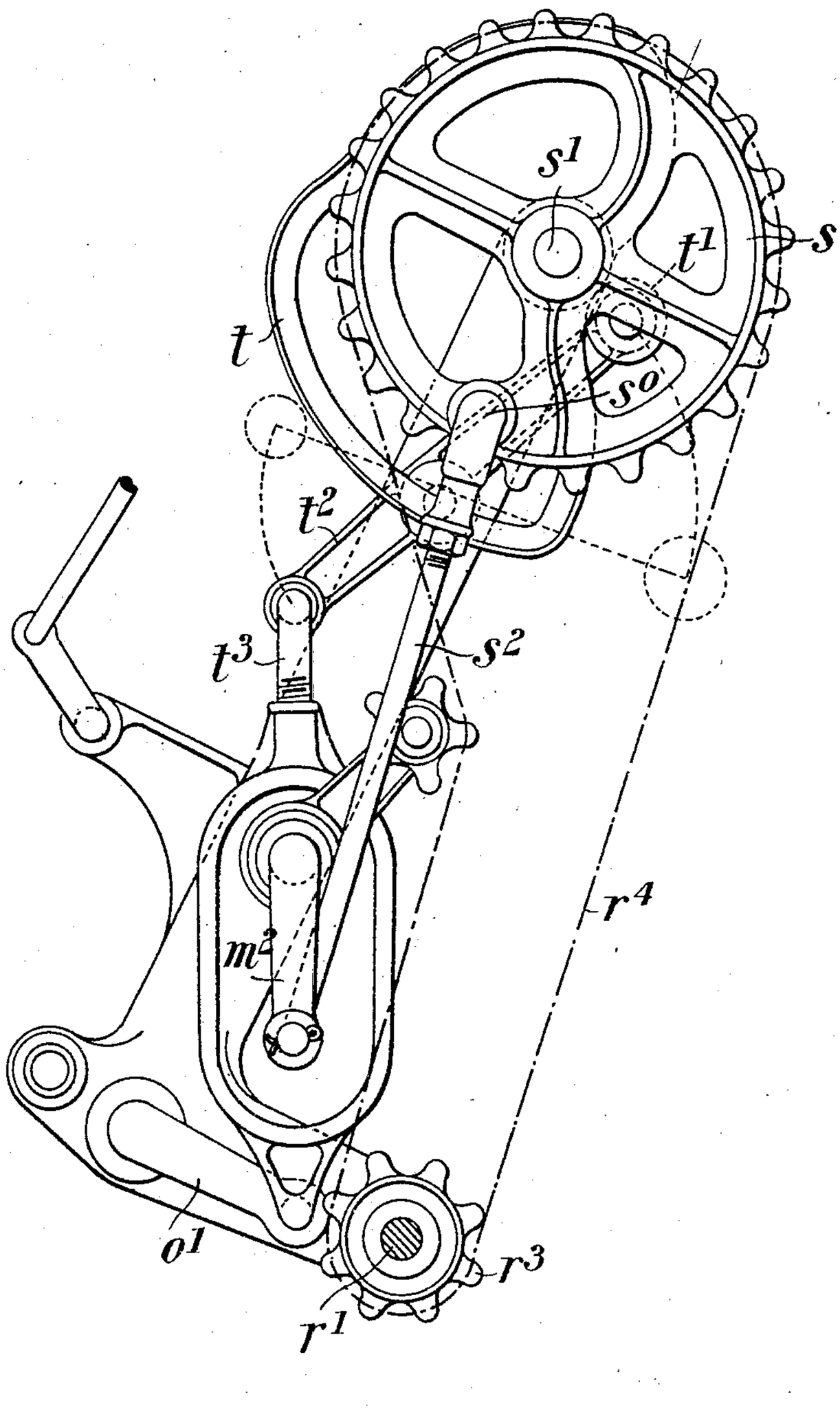
NO MODEL. 3 SHEETS—SHEET 3.

Fig. 3



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No. 774,894. Patented November 15, 1904.

UNITED STATES PATENT OFFICE.

DAVID ROBERTS AND JOHN LOWSON, OF GRANTHAM, ENGLAND.

SHEAF BINDING OR TRUSSING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 774,894, dated November 15, 1904.

Application filed September 29, 1902. Serial No. 125,291. (No model.)

To all whom it may concern:

Be it known that we, DAVID ROBERTS and JOHN LOWSON, subjects of the King of Great Britain, both residing and having their post-office address at Spittlegate Iron Works, Grantham, in the county of Lincoln, England, have invented new and useful Improvements in Sheaf Binding or Trussing Mechanism, of which the following is a specification.

Our invention relates to sheaf binding or trussing mechanism, our improvements having especial reference to the arm for compressing the sheaves or trusses and carrying the twine around the same.

The object of our invention is to provide means whereby the binder-arm after completing the sheaf shall return by a different path to the position from which it started—viz., by a path nearer the detent against which the grain is compressed—and thus leave more room than formerly for the accumulation of the grain for the following sheaf during the time the binder mechanism is in action. To accomplish this, the binder-arm in place of turning on a fixed spindle is pivoted on the end of a lever also free to turn, the said lever being mounted on a spindle actuated advantageously by a cam and suitable lever-and-link connections, while the binder-arm is actuated advantageously by a crank and suitable lever-and-link connections through a spindle with universal joints; but either cams or cranks may be used for either or both motions. The cam and crank are placed on a shaft of the binder mechanism and so arranged that the motions of the binder-arm and of the lever on which it is mounted are combined to give the desired path of the arm.

In the accompanying drawings, Figure 1 is a sectional front elevation of a sheaf-binding harvester having our improvements applied to it. Fig. 2 is a plan of parts of the same; and Fig. 3 is a front view, drawn to a larger scale than Figs. 1 and 2, of gear for actuating the binding mechanism.

Referring to the drawings, a is the main frame of the machine, b the driving-wheel, and c the operating-wheel of mechanism for raising and lowering the main frame on the wheel b.

d is a chain-wheel mounted on the driving-wheel b and actuating, through a chain d', chain-wheel d^2, spindle d^3, and bevel-gearing d^4, the spindle e, from which motion for operating the cutting and binding mechanism is derived.

f is the usual platform conveyer, onto which the cut grain falls, and g is a revolving drum having several circumferential rows of curved arms h, which receive the grain from the platform f and feed it up an inclined table i, a guard j being placed between adjacent rows of prongs h to prevent the grain returning with the prongs.

The roller k for the platform conveyer f is actuated from the spindle e by chain-wheels k' k' and chain k^2. The same chain also drives the drum g through gear-wheels. (Not shown.)

l is the usual binder-arm, secured to the spindle m, and l' l' are auxiliary side arms, also secured to the spindle m and sometimes used to assist in the separation and compression of the grain, the said spindle m being carried in bearings in levers n n, secured to a spindle o, at the front end of which is the lever o', and being actuated, with the arm l and auxiliary arms l' l', through the universal joints m' m' and lever m^2.

p is the usual trip-lever for putting the binder mechanism in motion, and q the usual detent, pivoted on the spindle q' and against which the sheaf is compressed.

Upon the shaft e is a gear-wheel r, Fig. 1, which engages with a gear-wheel r' on a spindle r^2, and this spindle has loosely mounted upon it a sprocket-wheel r^3, which is connected by a chain r^4 with a sprocket-wheel s on the knotter-shaft s'.

In connection with the wheel r^3 and upon the spindle r^2 is arranged clutch mechanism of any suitable construction combined with the trip-lever p in such a manner that when under the compression of the collected grain the said trip-lever p is operated the said clutch mechanism is put into gear to cause the rotation of the wheel s and the operation of the knot-

ting mechanism. On the wheel s is a crank-pin s^0, which is connected by a rod s^2 to the lever m^2, and the said wheel s has also formed upon it a cam-path t, which operates upon a roller t', carried at one end of a lever t^2, the other end of which is connected by an adjustable link t^3 with the arm o', with which arrangement it will be understood that when motion is imparted to the wheel s the shaft m will be rocked, and at the same time the levers n n, carrying the said shaft, will be oscillated through the arc of a circle, as indicated by the dotted lines in Fig. 1.

The shape of the cam t and the position of the same relatively with the pin s^0 are so adjusted as to cause the point of the binder-arm l when carrying the twine round the sheaf to any of the usual knotter mechanisms v and compressing the sheaf against the detent q to travel in the dotted curved line u.

The detent q is actuated in the usual manner from the binder mechanism and so adjusted that on a sheaf being formed and the knot tied the detent q is rocked backward, and the ejector-arms w, coming behind the sheaf, pass it over the driving-wheel b to the ground or to any of the usual carriers. The point of the binder-arm l, through the action of the crank-pin s^0 and cam t, returns to its starting position through the path u' u', and thus leaves room for the incoming grain. At the same time the other parts of the mechanism are returned to their starting position ready to receive another sheaf.

The binder-arm l has a hinged tailpiece l^2, which drops clear of the driving-wheel b and other mechanism, but on being carried through the table i takes the path of the binder-arm l. The said tailpiece can only leave the path of the arm l outwardly—that is to say, it cannot be compressed inwardly toward the axis of rotation, and consequently it will prevent the grain being fed under the arm l during the return stroke of the latter. We may, if required, add the usual packer-arms to assist the binder-arm l in raising the grain against the detent q.

Although we have described our improvements as applied to a sheaf-binder harvester of the kind forming the subject-matter of our application of even date, No. 125,290, it is to be understood that it may be applied to other sheaf-binding harvesters—such, for instance, as those of the type where the sheaf is bound outside the main driving-wheel—and also to machines for trussing straw, a number of binding-arms, each with its tying mechanism, being used to correspond with the number of ties on the truss.

A crank actuating the binder-arm and a cam actuating the oscillating levers have been shown; but cams or cranks may be used for either or both motions.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is—

In a sheaf binding and trussing machine, the combination with the binder-platform a trip-lever thereon and knotter mechanism located above the said platform, of a binder-arm pivoted below and capable of lying completely beneath the said platform, a shaft or axis upon which the binder-arm is carried, pivoted levers carrying the said shaft or axis and means for oscillating the said levers in such a manner that the point of the binder-arm descends beneath the table after tying a sheaf or truss at a point nearer to the trip-lever than that at which it rises above the table preparatory to tying a sheaf or truss, substantially as described.

DAVID ROBERTS.
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Witnesses:
JOHN E. BOUSFIELD,
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